

**FLUOR FERNALD CLOSURE PLAN
BASIS OF ESTIMATE**

**PBS-07
SILOS PROJECT**

SEPTEMBER 2001

**40000-PL-0001
REVISION 1**

Section 4: HS1A – Silos 1 and 2

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- 1.5.5 HS1AF – Subcontracts – Miscellaneous
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- 4.0 Estimate
- 5.0 Risk Plan

Section 4: HS1A – Silos 1 and 2

LIST OF ACRONYMS

ALARA	as low as reasonably achievable
APR	Air Purifying Respirator
ARAR	applicable or relevant and appropriate requirements
AWR	Accelerated Waste Retrieval
AWWT	Advanced Waste Water Retrieval
BAFO	Best and Final Offer
CADD	Computer Aided Drafting and Design
CAM	Control Account Manager
CAT	Construction Acceptance Testing
CCM	Construction Contract Manager
CCTV	closed circuit television
CD	critical decision
CFC	certified for construction
CFR	Code of Federal Regulations
COC	constituent of concern
CONOPS	Conduct of Operations
CR	Control Room
CRB	Contract Review Board
DCN	Design Change Notice
D&D	decontamination and dismantlement
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
ECDC	Engineering and Construction Document Control
EIP	Energy Isolation Plan
EM	Environmental Management
EOC	Emergency Operations Center
EPA	U.S. Environmental Protection Agency
FAT&LC	Fernald Atomic Trades and Labor Council
FEMP	Fernald Environmental Management Project
FHA	Fire Hazard Analysis
FSAR	Final Safety Analysis Report
FSWP	Facility Shutdown Work Plan
FTEs	Full Time Equivalent

Section 4: HS1A – Silos 1 and 2

LIST OF ACRONYMS (cont'd)

GCBCTC	Greater Cincinnati Building and Construction and Trades Council
HC	Hazard Category
HCC	Hazard Category Calculation
HEPA	High Efficiency Particulate Air
HFE	Human Factors Evaluation
ICAT	Integrated Construction Acceptance Testing
IFB	Invitation for Bid
IHA	Integrated Hazard Analysis
IP-2	industrial packaging type 2
ISRC	Independent Safety Review Committee
LSA-II	Low Specific Activity-II
MSCC	Material Segregation and Containerization Criteria
NTS	Nevada Test Site
ODCs	other direct costs
OEPA	Ohio Environmental Protection Agency
OIH	other industrial hazard
OJT	on the job training
O&M	operations and maintenance
ORR	Operational Readiness Review
OSDF	On-site Disposal Facility
OSHA	Occupational Safety and Health Administration
OU	operable unit
PAPR	Powered Air Purifying Respirator
PAAA	Price Anderson Amendment Act
PBS	Project Budget Sheet
PDRI	Project Definition Rating Index
PEP	Project Execution Plan
PHA	Preliminary Hazard Assessment
POA	Plan of Action
PPA	Process Plant Area
PPE	personal protective equipment
PSAR	Preliminary Safety Analysis Report
QA	Quality Assurance
QAJSP	Quality Assurance Job Specific Plan

Section 4: HS1A – Silos 1 and 2

LIST OF ACRONYMS (cont'd)

QC	Quality Control
QEP	Quality Execution Plan
RA	Remedial Action
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RCS	Radon Control System
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
RDWP	Remedial Design Work Plan
RIP	Readiness Implementation Plan
ROD	Record of Decision
RTS	Radon Treatment System
SBDIP	Safety Basis Documentation Implementation Plan
SEB	Source Evaluation Board
SIH	standard industrial hazard
SIP	Source Inspection Plans
SOT	System Operability Testing
SSR	Standard Startup Review
TBCs	to be considered criteria
TCLP	Toxicity Characteristic Leaching Procedure
TDP	Transportation and Disposal Plan
T&QP	Training and Qualification Plan
TRB	Technical Review Board
TTA	Transfer Tank Area
TWRS	Transfer Tank Area Waste Retrieval System
USQ	Unreviewed Safety Question
WAC	Waste Acceptance Criteria

Section 4: HS1A – Silos 1 and 2

MEASUREMENTS

cm	centimeters
ft ³	cubic feet
g/cm ³	grams per cubic centimeter
lb	pound
lbs/hr	pounds per hour
mrem/hr	millirem per hour
pCi/L	picocuries per liter
ppm	parts per million
scfm	standard cubic feet per minute
yd ³	cubic yards

ACRONYM
LIST

LIST OF ACRONYMS

ALARA	as low as reasonably achievable
APR	Air Purifying Respirator
ARAR	applicable or relevant and appropriate requirements
AWR	Accelerated Waste Retrieval
AWWT	Advanced Waste Water Retrieval
BAFO	Best and Final Offer
CADD	Computer Aided Drafting and Design
CAM	Control Account Manager
CAT	Construction Acceptance Testing
CCM	Construction Contract Manager
CCTV	closed circuit television
CD	critical decision
CFC	certified for construction
CFR	Code of Federal Regulations
COC	constituent of concern
CONOPS	Conduct of Operations
CR	Control Room
CRB	Contract Review Board
DCN	Design Change Notice
D&D	decontamination and dismantlement
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
ECDC	Engineering and Construction Document Control
EIP	Energy Isolation Plan
EM	Environmental Management
EOC	Emergency Operations Center
EPA	U.S. Environmental Protection Agency
FAT&LC	Fernald Atomic Trades and Labor Council
FEMP	Fernald Environmental Management Project
FHA	Fire Hazard Analysis
FSAR	Final Safety Analysis Report

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FTEs	Full Time Equivalent
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O&M	operations and maintenance
ORR	Operational Readiness Review
OSDF	On-site Disposal Facility
OSHA	Occupational Safety and Health Administration
OU	operable unit
PAPR	Powered Air Purifying Respirator
PAAA	Price Anderson Amendment Act
PBS	Project Budget Sheet
PDRI	Project Definition Rating Index
PEP	Project Execution Plan
PHA	Preliminary Hazard Assessment
POA	Plan of Action
PPA	Process Plant Area
PPE	personal protective equipment

LIST OF ACRONYMS (cont'd)

PSAR	Preliminary Safety Analysis Report
QA	Quality Assurance
QAJSP	Quality Assurance Job Specific Plan
QC	Quality Control
QEP	Quality Execution Plan
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TTA	Transfer Tank Area
TWRS	Transfer Tank Area Waste Retrieval System
USQ	Unreviewed Safety Question
WAC	Waste Acceptance Criteria

MEASUREMENTS

cm	centimeters
ft ³	cubic feet
g/cm ³	grams per cubic centimeter
lb	pound
lbs/hr	pounds per hour
mrem/hr	millirem per hour
pCi/L	picocuries per liter
ppm	parts per million
scfm	standard cubic feet per minute
yd ³	cubic yards

**WBS DICTIONARY
CONTROL ACCOUNT/CHARGE NUMBER**

U.S. DEPARTMENT OF ENERGY
 WORK BREAKDOWN STRUCTURE DICTIONARY
 PART II - ELEMENT DEFINITION

1. PROJECT TITLE FEMP (DEFENSE)		2. DATE OF CONTRACT 12/01/2000	
3. IDENTIFICATION NUMBER DE-AC24-01OH20115		4. INDEX LINE NO. 78	
5. WBS ELEMENT CODE 1.1.H.D		6. WBS ELEMENT TITLE SILOS 1 & 2	
7. APPROVED CP NO NEW PER CP# FY01-0115-0007-00		8. DATE OF CHANGES 12/01/2000	
9. SYSTEM DESIGN DESCRIPTION CERCLA / ACA		10. BUDGET AND REPORTING NUMBER EW05H3070	
11. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Labor Materials ODC's Subcontractor Teaming Partners</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Provide for the safe transfer of the Silos 1 and 2 material from the Transfer Tank Area (TTA), on-site treatment by a chemical stabilization process, and off-site disposal of the treated Silos 1 and 2 material at the Nevada Test Site (NTS). Included is the safe shutdown and D&D of the Silos 1 and 2 treatment and support facilities, including the TTA and RCS. Also included is the D&D of Silos 1,2,3 & 4, the superstructures over Silos 1,2 & 4, the old Radon Treatment Facility, the Silo 3 Remediation Facility, and the Vitrification Pilot Plant Facility.</p> <p><u>c. SCOPE OF WORK:</u></p> <p>Execute the Silo 1 & 2 remediation activities utilizing the combined strengths of the FEMP teaming partners and subcontractors for engineering, design, procurement, construction, operations, maintenance, waste packaging and disposition, and decontamination and demolition (D&D).</p> <p>The Silos 1 and 2 Project will consist of the TTA, the treatment facility, and the RCS. The TTA will be used for the storage of Silos 1 and 2 material and decant sump material prior to treatment. The treatment facility will consist of a slurry receipt system to receive the transferred material from the TTA tanks, a chemical stabilization facility to treat Silos 1 and 2 material by immobilizing the COCs. The treatment facility will have an interim staging area for curing the treated material and for staging the material while waiting</p>			

U.S. DEPARTMENT OF ENERGY
 WORK BREAKDOWN STRUCTURE DICTIONARY
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9. SYSTEM DESIGN DESCRIPTION CERCLA / ACA	10. BUDGET AND REPORTING NUMBER EW05H3070
11. ELEMENT TASK DESCRIPTION <p>approval for disposal and an air emissions control system for management of radionuclide particulate emissions from the treatment process. Both the TTA and the treatment facility are connected to the RCS for management and controlled release of radon emissions from the remediation process. The containers will be loaded onto truck trailers for shipment to the NTS.</p> <p>Chemical stabilization is defined as a non-thermal treatment process that mixes the Silos 1 and 2 material (including BentoGrout[®]) with a variety of chemical additive formulations (e.g., lime, pozzolans, gypsum, portland cement, or silicates) to accomplish chemical and physical binding of the constituents of concern. These processes provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix.</p> <p>Treated Silos 1 and 2 material will be packaged in containers that meet the specifications for a DOT Specification 7A, Type A containers presented in 49 CFR Section 178.350-A. Upon verification that the treated material meets the NTS WAC, the packaged material will be shipped to the NTS for final disposal.</p> <p>In addition to the remediation of Silos 1 and 2 material, the project will consist of the safe shutdown and D&D of the Silos 1 and 2 treatment facility and support facilities, including the TTA, and the RCS. The object of safe shutdown will be to place the facilities in a controlled state ready for dismantlement. D&D will consist of decontamination, demolition, and disposition of the waste remediation facilities including equipment, buildings, concrete slabs, and any below-grade structures and appurtenances, the D&D of Silos 1,2,3 & 4, the superstructures over Silos 1,2 & 4, the old Radon Treatment Facility, the Silo 3 Remediation Facility, and the Vitrification Pilot Plant Facility.</p>	

**WORK SCOPE DEFINITION
(Control Account)**

1. PROJECT TITLE FEMP (DEFENSE)		2. DATE 12/01/2000	Page 1
3. WBS ELEMENT CODE 1.1.H.D	4. WBS ELEMENT TITLE/NAME SILOS 1 & 2		
5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 12/00 - 04/08	
12. TASK IDENTIFICATION (CONTROL ACCOUNT) HS1A	13. TASK DESCRIPTION (ONE LINE) SILOS 1 AND 2		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Labor ODCs Subcontractors Material</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>The Technical scope of the Silo's 1 and 2 Project is the safe retrieval and transfer of the Silo's 1 and 2 material from the Transfer Tank Area, (TTA), onsite treatment by a chemical stabilization process, and offsite disposal of the treated material at the Nevada Test Site (NTS). In addition, the project includes the continued operation of the Radon Control System (RCS), improvements to the FEMP transportation infrastructure, and D&D of all the above ground Silo's 1 and 2 structures and facilities.</p> <p><u>c. SCOPE OF WORK:</u></p> <p>The Silos 1 and 2 Project will consist of the TTA, the treatment facility, support facilities and the RCS. The TTA will be used for the storage of Silos 1 and 2 material and decant sump material prior to treatment. The treatment facility will consist of a slurry receipt system to receive the transferred material from the TTA tanks, a chemical stabilization facility to treat Silos 1 and 2 material, and a system to containerize the treated (stabilized) material. The treatment facility will also have an interim storage area for curing and staging the treated material while waiting approval for disposal and an air emissions control system for control of radionuclide particulate emissions from the treatment process. Both the TTA and the treatment facility are connected to the RCS for control of radon emissions from the remediation process. The</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Andrew Weeks</i>	

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(Control Account)

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 12/00 - 04/08	
12. TASK IDENTIFICATION (CONTROL ACCOUNT) HS1A	13. TASK DESCRIPTION (ONE LINE) SILOS 1 AND 2		

14. ELEMENT TASK DESCRIPTION

containers will be loaded onto truck trailers for shipment to the NTS.

In addition to the remediation of Silos 1 and 2 material, the project will consist of the safe shutdown and D&D of the Silos 1 and 2 treatment facility and support facilities, including the TTA and the RCS. The object of safe shutdown will be to place the facilities in a controlled state ready for dismantlement.

d. WORK SPECIFICALLY EXCLUDED:

None

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(Work Package)

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 12/00 - 06/08	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AA	13. TASK DESCRIPTION (ONE LINE) PROJECT OVERSIGHT - SILOS 1 AND 2		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Labor Subcontractors ODCs Material</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Activities required by Fluor Fernald to manage and provide oversight of the Silos 1 and 2 Project</p> <p><u>c. SCOPE OF WORK:</u></p> <p>The scope of Project Oversight consists of those activities needed to support the implementation of the Silos 1 and 2 Project and the documentation required, under the terms of the Site Closure Contract, to demonstrate the ability to execute the Silos 1 and 2 Project. The project documents represent the highest-level project documents generated and effectively describe the methods and reflect the FEMP Programs and Plans to complete the defined scope of work. The Project Oversight tasks consists of the following two (2) subtasks: Project Management; and Project Documentation.</p> <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p> <p>None</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard West</i>	

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00	11. ESTIMATED START / COMPLETION DATE 01/01 - 02/02
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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AB	13. TASK DESCRIPTION (ONE LINE) DESIGN DATA DEVELOPMENT
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14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Labor
Subcontractors
ODCs
Material

b. TECHNICAL CONTENT:

Activities required by the Silos 1 and 2 Project to conduct Design Data Development for the Silos 1 and 2 design effort

c. SCOPE OF WORK:

The scope of Design Data Development consists of collection of project-specific data to understand the physical and chemical characteristics of the proposed treatment formulation for chemical stabilization and to support the development of the design of the Silos 1 and 2 treatment process, support facilities, and waste container design. The Design Data Development task will be accomplished through a joint effort between Duratek and the Silos 1 and 2 Site Engineering Team. The Design Data Development task consists of the following subtasks: Design Data Development Work Plan; Laboratory Work Package; Collect and Ship Silo Material; Design Data Development Programs; and Final Report.

d. WORK SPECIFICALLY EXCLUDED:

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>George West</i>
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4303	R. FELLMAN	R. FELLMAN	
8. BUDGET AND REPORTING NUMBER	9. BUDGET TITLE		
EW05H3070	SILOS		
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12. TASK IDENTIFICATION (WORK PACKAGE)	13. TASK DESCRIPTION (ONE LINE)		
HS1AB	DESIGN DATA DEVELOPMENT		
14. ELEMENT TASK DESCRIPTION			
FF oversight			

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 01/01 - 04/02	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AC	13. TASK DESCRIPTION (ONE LINE) CONCEPTUAL DESIGN - FFI		
<p>14. ELEMENT TASK DESCRIPTION</p> <p><u>a. ELEMENTS OF COST:</u></p> <p>Labor ODCs</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Activities required to complete the design of Silos 1 and 2 Project.</p> <p><u>c. SCOPE OF WORK:</u></p> <p>Fluor Fernald engineering will support the Jacobs Engineering preparation of the Conceptual Design Package to further define the design concept and to demonstrate the appropriate integration of the functional and technical requirements into the design. The Conceptual Design Package will consist of the following documents covering the major systems:</p> <p>Process and Mechanical Flow Diagrams Heat and Material Balances Process Descriptions Piping and Instrument Diagrams General Arrangement Drawings Electrical Single Line Diagrams Site Plot Plans HVAC Flow and Control Diagrams Equipment List including Specialty Equipment Construction Cost Estimate from Site Closure Baseline</p> <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Pickett</i>	

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00	11. ESTIMATED START / COMPLETION DATE 01/01 - 04/02
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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AC	13. TASK DESCRIPTION (ONE LINE) CONCEPTUAL DESIGN - FFI
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14. ELEMENT TASK DESCRIPTION

FF Oversight (HS1AA)
Conceptual Design - Jacobs (HS1AE)

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 10/01 - 08/05	

12. TASK IDENTIFICATION (WORK PACKAGE) HS1AD	13. TASK DESCRIPTION (ONE LINE) CONSTRUCTION MANAGEMENT
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14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Labor
Subcontractors
ODCs
Material

b. TECHNICAL CONTENT:

The Silos 1 and 2 Project team will strategically divide the design and specifications of the construction scope into logical bid packages, i.e., by discipline - Civil, Mechanical, and Electrical. Fixed-Price Contracts will be secured through an IFB process for each bid package. Wise Services, Inc. will be used for interface work between the Fixed-Price Contracts. Fluor Fernald will perform CAT and Integrated (ICAT). Fluor Fernald and Jacobs Engineering will jointly provide Title III field service support. The scope, schedule, and resources for the Silos 1 and 2 Construction Management will be managed and reported under the following three (3) tasks:

- Construction Design Support;
- Construction IFB Support; and
- Construction Subcontract Management.

c. SCOPE OF WORK:

Assumptions
The construction contractors shall be required to utilize the labor force to construct the remediation facilities in accordance with the FEMP's labor agreement with the Greater Cincinnati Building and Construction Trades Council (GCBCCTC).
A 10% overtime factor will be applied to construction contract manhours to

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Andrew P. West</i>
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5. PERFORMING DIV/DEPARTMENT CODE	6. ORIGINATOR NAME/PHONE	7. WBS ELEMENT MANAGER	
4303	R. FELLMAN	R. FELLMAN	
8. BUDGET AND REPORTING NUMBER	9. BUDGET TITLE		
EW05H3070	SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?		11. ESTIMATED START / COMPLETION DATE	
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12. TASK IDENTIFICATION (WORK PACKAGE)	13. TASK DESCRIPTION (ONE LINE)		
HS1AD	CONSTRUCTION MANAGEMENT		
14. ELEMENT TASK DESCRIPTION			
<p>support the subcontractor.</p> <p>Construction Design Support This scope of work will be performed by Fluor Fernald and includes constructability reviews, infrastructure coordination, and planning and bidding support. The design constructability review process involves evaluating and integrating practical construction practices and requirements into the design configuration by ensuring safety; efficiency; cost and schedule benefits; productivity in field construction operations; safe accessibility of personnel, material, and equipment; facilitation of construction during adverse weather; sequencing activities to facilitate system turnover and start up; and the use of innovative construction methods to enhance constructability. Constructability reviews also include waste planning, and decontamination and demolition planning. Silos 1 and 2 Project construction will be integrated with the existing FEMP infrastructure. Coordination planning involves Site/Use Allocation Committee, Silos Facility Owner, Utilities Engineer, Fire Protection Engineering, and Advanced Wastewater Treatment (AWWT). The Silos 1 and 2 Project is also responsible for interfacing with adjacent projects. Construction also assists in the preparation of scope and requisitions for work/services that are outside of the scope in the contract, including services previously identified as being provided by Fluor Fernald and is responsible for preparing the construction schedule, draft Quality Assurance/Quality Control requirements, developing construction estimates, developing pay item description including breakdown of work items and tasks, sequence of work, scope of work and re-submitting work scope/work package for labor standards determination, and pre-qualification of bidders.</p> <p>Construction IFB Support It is assumed that IFB/RFP(s) will be prepared using the nine (9) part model contract pursuant to FEMP Procedure CT-2.1.1 (Rev. 11). When the engineering design package reaches preliminary status of completion, construction personnel will begin preparing bid packages for construction subcontractors. IFB preparation includes:</p> <ul style="list-style-type: none"> · Develop IFB/RFP Package; · Draft Safe Work Plans for inclusion in the IFB/RFP, Part 8; · Draft construction testing requirements (Quality Evaluation Plans (QEPs) or Source Inspection Plans (SIPs), Part 9; 			

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 10/01 - 08/05	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AD	13. TASK DESCRIPTION (ONE LINE) CONSTRUCTION MANAGEMENT		
14. ELEMENT TASK DESCRIPTION			
<ul style="list-style-type: none"> · Draft Turnover Plan; · Contractor Submittal Register, Part 6; · Scope of Work, Part 6; · Pay-item Description, Part 6; and · Assembly of Certified for Construction drawings and specifications, Part 7. <p>Construction Safe Work Plans will be developed by Fluor Fernald and/or the subcontractor, describing the work in sufficient detail to provide assurance that the risks associated with the work have been assessed and preventive measures for hazards addressed, and the work has been safely planned in sufficient detail. A draft of each safe work plan will be included in the IFB package, with the final safe work plans being completed by the subcontractor after contract award.</p> <p>The IFB packages for the Civil, Mechanical, and Electrical work will be prepared and released for bids in parallel to each other.</p> <p>Construction Subcontract Management During construction, Fluor Fernald will perform daily oversight of subcontractors to ensure that the requirements of the contract are being followed in the field, including safety performance, compliance with Remedial Design plans, and verification of installation per approved drawings and specifications. Subcontract management also involves providing permits in accordance with the planned work and tracking the subcontractor's schedule. Subcontract management also includes:</p> <ul style="list-style-type: none"> · Submittal(s) review and approval; · Finalize Safe Work Plans; · Safety Meetings; · Permits; · Mobilization; · Construction Testing Requirements (QEPs, SIPs); · Request for Information/Design Change Notices; · Contract Modifications; · Quality Assurance (surveillance(s) and assessments); · Progress reporting (cost and schedule); and · Red-line and as-built drawings. 			

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5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00	11. ESTIMATED START / COMPLETION DATE 10/01 - 08/05
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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AD	13. TASK DESCRIPTION (ONE LINE) CONSTRUCTION MANAGEMENT
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14. ELEMENT TASK DESCRIPTION

Permits will be issued by Fluor Fernald after approval of a Safe Work Plan. Permits include: Work permits; Radiological, Penetration; Service Interruption; Energy Isolation Plans; Open Flame and Welding; Confined Space Evaluation; Chemical Hazardous Material; and Scaffold Inspection Checklist/Access. Fluor Fernald shall provide 100% oversight during penetration/excavation activities and lock and tag activities. Fluor Fernald will provide monitoring required for Heat and Cold Stress, radiological surveys, and monitoring. Fluor Fernald will provide any launderable personal protective equipment. Quality will witness vendor tests and perform inspections and surveillances of construction facilities. Quality will perform vendor shop surveillances, and source inspections per FEMP site procedures. The contractor representative will perform construction acceptance testing with verification and approval by Fluor Fernald.

d. WORK SPECIFICALLY EXCLUDED:

None

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/01 - 07/01	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AE	13. TASK DESCRIPTION (ONE LINE) CONCEPTUAL DESIGN - JACOBS		

14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Subcontractors

b. TECHNICAL CONTENT:

Activities required to complete the design of the Silos 1 and 2 Project

c. SCOPE OF WORK:

Jacobs Engineering will prepare the Conceptual Design Package to further define the design concept and to demonstrate the appropriate integration of the functional and technical requirements into the design. The Conceptual Design Package will consist of the following documents covering the major systems:

- Process and Mechanical Flow Diagrams
- Heat and Material Balances
- Process Descriptions
- Piping and Instrument Diagrams
- General Arrangement Drawings
- Electrical Single Line Diagrams
- Site Plot Plans
- HVAC Flow and Control Diagrams
- Equipment List including Specialty Equipment
- Construction Cost Estimate from Site Closure Baseline

d. WORK SPECIFICALLY EXCLUDED:

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard E. West</i>
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/01 - 07/01	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AE	13. TASK DESCRIPTION (ONE LINE) CONCEPTUAL DESIGN - JACOBS		

14. ELEMENT TASK DESCRIPTION
FF Oversight (HS1AA)
Conceptual Design - FFI (HS1AC)

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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AF	13. TASK DESCRIPTION (ONE LINE) CONSTRUCTION SUB MISC		

14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Subcontractors
Material

b. TECHNICAL CONTENT:

Long lead procurements and construction contracts to support the construction of the Silo's 1 and 2 remediation facilities

c. SCOPE OF WORK:

The scope of this task consists of miscellaneous work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.

d. WORK SPECIFICALLY EXCLUDED:

FF Oversight

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Robert West</i>
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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 05/04 - 04/05	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AG	13. TASK DESCRIPTION (ONE LINE) CONSTRUCTION ELECTRICAL		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Subcontractors</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Electrical Construction Package for the Silos 1 and 2 remediation facilities.</p> <p><u>c. SCOPE OF WORK:</u></p> <p>The scope of this task consists of electrical work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.</p> <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p> <p>FF Oversight</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Anthony Pulizzi</i>	

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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AH	13. TASK DESCRIPTION (ONE LINE) CONSTRUCTION MECHANICAL
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14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Subcontractors

b. TECHNICAL CONTENT:

Mechanical construction package for the Silo's 1 and 2 remediation facilities.

c. SCOPE OF WORK:

The scope of this task consists of mechanical work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.

d. WORK SPECIFICALLY EXCLUDED:

FF Oversight

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Harold P. White</i>
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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AJ	13. TASK DESCRIPTION (ONE LINE) CONSTRUCTION CIVIL		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Subcontractors</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Civil construction package for the Silos 1 and 2 remediation facilities</p> <p><u>c. SCOPE OF WORK:</u></p> <p>The scope of this task consists of civil work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.</p> <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p> <p>FF Oversight</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Sweet</i>	

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5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/03 - 05/06	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AK	13. TASK DESCRIPTION (ONE LINE) STARTUP/READINESS		

14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Labor
Subcontractors
ODCs
Material

b. TECHNICAL CONTENT:

Activities required to conduct Fluor Fernald's support for the Silo's 1 and 2 Project Startup and Readiness

c. SCOPE OF WORK:

The scope of Startup and Readiness consists of those activities necessary to demonstrate that the project has been properly constructed and ready for operations and that the workforce has been properly trained and is ready to safely operate the facility. The startup and readiness activities include project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design basis. Additionally, the scope includes an evaluation of operational readiness by Fluor Fernald and a subsequent readiness evaluation by DOE-FEMP. The Startup and Readiness task consists of the following subtasks:

Startup Management;
Operations and Maintenance Procedures Development;
Training;
SOT; and
ORR.

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard [Signature]</i>
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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/03 - 05/06	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AK	13. TASK DESCRIPTION (ONE LINE) STARTUP/READINESS		
14. ELEMENT TASK DESCRIPTION <u>d. WORK SPECIFICALLY EXCLUDED:</u> None			

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 10/01 - 05/07	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AL	13. TASK DESCRIPTION (ONE LINE) OPERATIONS & MAINTENANCE		
14. ELEMENT TASK DESCRIPTION			

a. ELEMENTS OF COST:

Labor
Subcontractors
ODCs
Material

b. TECHNICAL CONTENT:

Activities required to cover all of Fluor Fernald's labor and support for the operation and maintenance activities defined in the Silo's 1 and 2 Project Schedule.

c. SCOPE OF WORK:

The scope of Operations and Maintenance consists of those activities necessary to support the proper operation of the TTA, the Radon Control System, the Silos 1 and 2 treatment process, and all support facilities. The scope will include retrieval of material from the TTA tanks, treatment of material to meet the NTS WAC, and treatment of radionuclides, particulate, and radon in the RCS. The Operations and Maintenance task consists of the following subtasks: Waste Transfer and Treatment; and RCS and TTA Operations.

d. WORK SPECIFICALLY EXCLUDED:

None

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Andrew Swales</i>
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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 09/02 - 08/07	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AM	13. TASK DESCRIPTION (ONE LINE) WASTE OPERATIONS		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Labor Subcontractors ODCs Material</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Fluor Fernald is responsible for the proper packaging, transportation, and disposal of treated Silos 1 and 2 material. Fluor Fernald is also responsible for the proper management of secondary waste. This scope covers the management of treated Silos 1 and 2 material and secondary waste generated during remediation activities. The tasks associated with Waste Operations are:</p> <ul style="list-style-type: none"> · Container Acquisition; · Container Contracts; · Waste Disposition; · Transportation; and · DOE Waste Disposal. <p><u>c. SCOPE OF WORK:</u></p> <p>Assumptions Treated Silos 1 and 2 material will be packaged in approximately 7,500 custom designed containers. One percent of the 7,500 containers of the treated Silos 1 and 2 material will fail to meet the NTS WAC and require additional treatment such as macroencapsulation. The 7,425 containers of treated Silos 1 and 2 material that meet the NTS WAC</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>George Wells</i>	

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14. ELEMENT TASK DESCRIPTION

will require 3,713 truck shipments.
The 75 containers that do not meet the NTS WAC will require 75 shipments after additional treatment.
Secondary, facility shutdown, and D&D waste will result in the need for 634 shipments to the NTS.
Treated Silos 1 and 2 material will result in a disposal volume of 1,559,250 ft³ at the NTS.
Off-specification Silos 1 and 2 material will result in a disposal volume of 17,625 ft³ at the NTS.
Secondary, facility shutdown, and D&D waste will result in a disposal volume of 286,258 ft³ at the NTS.
Approximately 100 yd³ of contaminated soil will be excavated during construction activities.
Approximately 1,727 roll-off boxes (30 yd³ each) of secondary, facility shutdown, and D&D waste will be disposed in the on-site disposal facility (OSDF).

Container Acquisition
The Silos 1 and 2 Engineering team will prepare an IFB package using the container design approved under the Engineering and Design task. Duratek and Fluor Fernald will review the IFB package and will oversee implementation of the container manufacturing contracts. The Silos 1 and 2 Engineering Team will provide technical support to the oversight and management of the container manufacturing contracts.

Waste Disposition
Fluor Fernald Waste Generator Services personnel will verify treated Silos 1 and 2 material meets the NTS WAC for disposal. Waste Generator Services and the Waste Acceptance Organization will process analytical data. Transportation personnel will prepare shipping manifests for each waste shipment.

Transportation
The Silos 1 and 2 Site Engineering team will prepare a performance specification RFP for the transportation of treated Silos 1 and 2 material and other waste streams to the NTS. Fluor Fernald Transportation, Acquisition, and Waste Generator Services will assist in the preparation of the RFP. The Silos 1 and 2 Site Engineering team will select up to four (4) contractors under the terms and

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 09/02 - 08/07	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AM	13. TASK DESCRIPTION (ONE LINE) WASTE OPERATIONS		
14. ELEMENT TASK DESCRIPTION conditions of fixed-unit price contracts. Fluor Fernald will perform oversight and management of the transportation contracts. DOE Waste Disposal Fluor Fernald will ensure the safe and proper disposal of waste at either the NTS or the OSDF. <u>d. WORK SPECIFICALLY EXCLUDED:</u> None			

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 05/06 - 10/07	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AN	13. TASK DESCRIPTION (ONE LINE) SAFE SHUTDOWN		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Labor Subcontractors ODCs Material</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Activities required by Fluor Fernald to conduct Silo's 1 and 2 safe shutdown activities</p> <p><u>c. SCOPE OF WORK:</u></p> <p>The scope of Facility Shutdown consists of those activities necessary to support safe shutdown of the TTA, RCS, Silos 1 and 2 treatment process, and support facilities. The scope of Facility Shutdown includes: isolation of utilities; establishment of temporary utilities; removal and treatment of hold-up material; and gross decontamination. Fluor Fernald will perform safe shutdown activities using FAT&LC personnel in accordance with the Collective Bargaining Agreement. The Facility Shutdown task consists of the following subtasks: Facility Shutdown Work Plan; and Facility Shutdown.</p> <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p> <p>None</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Harold P. Woods</i>	

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00	11. ESTIMATED START / COMPLETION DATE 06/04 - 06/08
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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AP	13. TASK DESCRIPTION (ONE LINE) D&D SUPPORT
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14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Labor
Subcontractors
ODCs
Material

b. TECHNICAL CONTENT:

The Silos 1 and 2 Site Engineering Team will develop a performance specification to procure the services of a qualified contractor to perform the D&D of the OU4 structures and remediation facilities under the terms and conditions of a fixed-price contract. These facilities include the Silos Maintenance Shop, (formerly the Vitrification Pilot Plant) the abandoned RTS, the new RCS, the TTA, the Silos support trailers, Silos 1, 2, 3, and 4, and the Silo 3 remediation facility. The scope, schedule, and resources for the D&D Support will be managed by the following four (4) tasks:

- D&D Implementation Plan;
- Develop D&D RFP;
- Bid and Award D&D Package; and
- D&D Contract Management and Support.

c. SCOPE OF WORK:

Assumptions
All debris from the D&D activities will meet either the NTS WAC or the OSDF. 90% of the debris generated from D&D will be disposed in the OSDF. 10% of the debris generated from D&D will be sent to the NTS for disposal. The 10% sent to the NTS will require 2,390 white metal boxes.

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard B. Wells</i>
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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 06/04 - 06/08	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AP	13. TASK DESCRIPTION (ONE LINE) D&D SUPPORT		
14. ELEMENT TASK DESCRIPTION			
<p>D&D Implementation Plan The Silos 1 and 2 Site Engineering team will be responsible for the preparation of the D&D Implementation Plan that will elaborate, as applicable, on programmatic strategies developed by Operable Unit 3, above-grade D&D strategies developed for the contractor's scope of work, project plans, and specifications. The Silos 1 and 2 Implementation Plan will be peer reviewed by selected Duratek and Fluor Fernald personnel. The Silos 1 and 2 Site Engineering team will submit the Implementation Plan to the DOE, EPA, and OEPA for review and approval. Upon approval, the Implementation Plan will become part of the IFB Package for the D&D activities.</p> <p>Prepare D&D RFP The Silos 1 and 2 Site Engineering team will prepare a performance specification to secure the services of a qualified contractor under the terms and conditions of a fixed-price contract for the D&D of the Silos 1 and 2 remediation and support facilities. The performance specification will be consistent with the EPA-approved Silos 1 and 2 D&D Implementation Plan. The Silos 1 and 2 Site Engineering team in consultation with the Facilities D&D group and Waste Generator Services will prepare the technical scope for the RFP.</p> <p>Bid and Award D&D Contract The RFP for the Silos 1 and 2 D&D activities will be released to vendors for a period of 40 days. A Source Evaluation Board will be convened to evaluate the technical and cost proposals. Vendors will be given an opportunity to submit Best and Final Offers prior to completing vendor selections. The Silos 1 and 2 Site Engineering team will prepare a consent package for DOE review and approval prior to awarding the contract.</p> <p>D&D Subcontract Management and Support During D&D, Fluor Fernald will perform daily oversight of the subcontractor to ensure that the requirements of the contract are being followed in the field, including safety performance, compliance with the EPA-approved D&D Implementation Plan, and verification of D&D activities per the subcontractor's work plan. Subcontract management also involves providing permits in accordance with the planned work and tracking the subcontractor's schedule. Subcontract management also includes:</p> <ul style="list-style-type: none"> · Submittal(s) review and approval; 			

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8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 06/04 - 06/08	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AP	13. TASK DESCRIPTION (ONE LINE) D&D SUPPORT		
14. ELEMENT TASK DESCRIPTION <ul style="list-style-type: none"> • Safety Meetings; • Permits; • Mobilization; • Inspecting Secondary Containment; • Contract Modifications; • Quality Assurance (surveillance(s) and assessment(s); and • Progress Reporting (cost and schedule). <p>During D&D field activities, Fluor Fernald will provide waste handling and disposition support to the Contractor. Fluor Fernald will be responsible for the final disposition of the D&D debris and secondary waste. D&D support includes:</p> <ul style="list-style-type: none"> • Providing containers and roll-off boxes for waste packaging; • Certification of waste for disposal at the NTS; • Certification of waste for disposal in the OSDF; and • Arrangements for off-site/on-site transportation. <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p> <p>None</p>			

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 02/06 - 04/08	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AR	13. TASK DESCRIPTION (ONE LINE) D&D SUBCONTRACT		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Subcontractors</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Fluor Fernald will be responsible for oversight of work performed by a qualified contractor under the terms and conditions of a fixed-price contract. The contractor will be responsible for D&D of the Operable Unit 4 structures and remediation facilities. These facilities include the Silos Maintenance Shop, the abandoned RTS, the RCS, the TTA, the Silos support trailers, Silos 1, 2, 3, and 4, and the Silo 3 remediation facilities.</p> <p><u>c. SCOPE OF WORK:</u></p> <p>The Silos 1 and 2 Site Engineering team will develop a performance-based specification to procure the services of a qualified contractor to perform the D&D of the Operable Unit 4 structures and remediation facilities under the terms and conditions of a fixed-price contract. The D&D of the Operable Unit 4 structures and facilities have been segregated into three phases due to the availability of their components for D&D in different years as follows:</p> <p>Phase I</p> <ul style="list-style-type: none"> · Silo 3; · Silo 4; · Silo 4 Superstructure; · Silo 3 Treatment Facilities; and · RTS. <p>Phase II</p> <ul style="list-style-type: none"> · Silo 1; 			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard West</i>	

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 02/06 - 04/08	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AR	13. TASK DESCRIPTION (ONE LINE) D&D SUBCONTRACT		

14. ELEMENT TASK DESCRIPTION

- Silo 2;
- Silos 1 and 2 Superstructure;
- Decant Sump Tank System; and
- K-65 Trench.

Phase III

- TTA;
- RCS;
- Silos 1 and 2 Treatment Facilities;
- Maintenance Shop (former Vitrification Pilot Plant); and
- OU4 Support Trailers.

The organization of the D&D contract will consist of a base contract and two contract options to address the Operable Unit 4 D&D scope as follows:

- Base Contract: Phase I;
- Option 1: Phase II; and
- Option 2: Phase III.

The Contractor's scope and requirements for performing the D&D of the Silos 1 and 2 remediation facilities includes the requirements for managing perched water, excavated soils, debris/waste handling criteria; removing/fixing radiological contamination; decontamination of Contractor-provided tools, equipment and materials; structural steel dismantlements; equipment dismantlement; interior dismantlement; and ventilation and containment.

d. WORK SPECIFICALLY EXCLUDED:

None

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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE. 07/03 - 02/08	

12. TASK IDENTIFICATION (WORK PACKAGE) HS1AT	13. TASK DESCRIPTION (ONE LINE) TRANSPORTATION CONTRACT
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14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Subcontractors

b. TECHNICAL CONTENT:

This is set up to report the progress of the transportation contracts for the shipment of the treated Silo's 1 and 2 material and D&D debris to the NTS for disposal

c. SCOPE OF WORK:

FF will establish contract(s) to ensure an adequate supply of transportation resources.

d. WORK SPECIFICALLY EXCLUDED:

FF Oversight

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard White</i>
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12. TASK IDENTIFICATION (WORK PACKAGE) HS1AU	13. TASK DESCRIPTION (ONE LINE) CONTAINER CONTRACT		

14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Subcontractors

b. TECHNICAL CONTENT:

This is established to report the progress of the container contracts for the packaging of the treated Silo's 1 and 2 material

c. SCOPE OF WORK:

Container Contracts
The manufacture of the Silos 1 and 2 containers will be performed under the terms and conditions of indefinite delivery/indefinite quantity, fixed-unit price contracts. Fluor Fernald will award up to four (4) contracts to ensure an adequate supply of containers.

d. WORK SPECIFICALLY EXCLUDED:

None

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>George E. White</i>
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10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 01/01 - 02/04	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AV	13. TASK DESCRIPTION (ONE LINE) PRELIMINARY DESIGN - FFI		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Labor Subcontractors ODCs</p> <p><u>b. TECHNICAL CONTENT:</u></p> <ul style="list-style-type: none"> - Preliminary Design Support - Container Design - Regulatory Deliverables - Safety Basis Documentation Support <p><u>c. SCOPE OF WORK:</u></p> <p>Fluor Fernald will support Jacobs Engineering preparation of the Preliminary Design Package. Duratek will design, build, test and certify the container for the treated Silos 1 and 2 material. Fluor will manage the preparation and submittal of regulatory deliverables to the agencies (RDWP, RD Package, RAWP, RA Package and TDP). Fluor will support Jacobs Engineering preparation of all safety basis documentations (PDSA and DSA).</p> <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p> <p>Jacobs Engineering resources. Fluor Oversight.</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Weeks</i>	

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1. PROJECT TITLE FEMP (DEFENSE)		2. DATE 12/01/2000	Page 1
3. WBS ELEMENT CODE 1.1.H.D	4. WBS ELEMENT TITLE/NAME SILOS 1 & 2		
5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 08/01 - 08/02	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AW	13. TASK DESCRIPTION (ONE LINE) PRELIMINARY DESIGN - JACOBS		

14. ELEMENT TASK DESCRIPTION

a. ELEMENTS OF COST:

Subcontractors

b. TECHNICAL CONTENT:

- Preliminary Design
- Safety Basis Documentation
- Regulatory Deliverable Support
- Container Design Support

c. SCOPE OF WORK:

The Preliminary Design Package will be developed by Jacobs Engineering. Jacobs will prepare the safety basis documentation necessary to support the project design. Jacobs will support the preparation of Regulatory Deliverables by releasing components of the design to Fluor Fernald. Jacobs will interface with the container design to ensure process related requirements are addressed.

d. WORK SPECIFICALLY EXCLUDED:

Fluor Oversight.

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Harold Roberts</i>
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WORK SCOPE DEFINITION
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1 PROJECT TITLE FEMP (DEFENSE)		2 DATE 12/01/2000	Page 1
3 WBS ELEMENT CODE 1.1.H.D	4. WBS ELEMENT TITLE/NAME SILOS 1 & 2		
5 PERFORMING DIV/DEPARTMENT CODE 4303	6 ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8 BUDGET AND REPORTING NUMBER EW05H3070	9 BUDGET TITLE SILOS		
10 ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/02 - 11/05	
12 TASK IDENTIFICATION (WORK PACKAGE) HS1AX	13 TASK DESCRIPTION (ONE LINE) FINAL DESIGN - FFI		

a. ELEMENTS OF COST:

Subcontractors
Labor
ODCs

b. TECHNICAL CONTENT:

- Final Design Support
- Container Design
- Regulatory Deliverables
- Safety Basis Design Support

c. SCOPE OF WORK:

Fluor Fernald will support Jacob's preparation of the Final Design Package and related safety basis documentation. Fluor will support Duratek's preparation of the container design. Fluor Fernald will prepare regulatory deliverables with Jacobs's support

d. WORK SPECIFICALLY EXCLUDED:

Jacob's engineering resources
Fluor Oversight and Management

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Harold Eukoff</i>
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1. PROJECT TITLE FEMP (DEFENSE)		2. DATE 12/01/2000	Page 1
3. WBS ELEMENT CODE 1.1.H.D	4. WBS ELEMENT TITLE/NAME SILOS 1 & 2		
5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/02 - 04/03	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1AY	13. TASK DESCRIPTION (ONE LINE) FINAL DESIGN - JACOBS		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Subcontractors</p> <p><u>b. TECHNICAL CONTENT:</u></p> <ul style="list-style-type: none"> - Final Design Package - Container Design Support - Regulatory Deliverables - Safety Basis Documentation <p><u>c. SCOPE OF WORK:</u></p> <p>Jacobs Engineering will prepare the Final Design Package and related safety basis documentation. Jacobs will interface with Fluor to ensure that the container design is integrated into the process design. Jacobs will support Fluor Fernald's preparation of the regulatory deliverables by providing specified component of the project design Fluor Fernald.</p> <p><u>d. WORK SPECIFICALLY EXCLUDED:</u></p> <p>Fluor Oversight.</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Angus West</i>	

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1. PROJECT TITLE FEMP (DEFENSE)		2. DATE 12/01/2000	Page 1
3. WBS ELEMENT CODE 1.1.H.D	4. WBS ELEMENT TITLE/NAME SILOS 1 & 2		
5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/03 - 04/08	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1A1	13. TASK DESCRIPTION (ONE LINE) ENG SUPPORT OF CONST, STRTUP, OPS AND D&D - FFI		
14. ELEMENT TASK DESCRIPTION			

a. ELEMENTS OF COST:

Labor
Subcontractors
ODCs

b. TECHNICAL CONTENT:

Fluor Fernald will provide technical support throughout construction, startup, operations, and D&D

c. SCOPE OF WORK:

Fluor Fernald and Jacobs Engineering will jointly perform engineering support responsibilities through construction, start-up, operations, and D&D. Silos 1 and 2 Site Engineering will provide a project engineer for each construction contract (i.e., civil, electrical, mechanical) throughout construction, SOT, start-up, and D&D activities. The Silos 1 and 2 Site Engineering Team and Jacobs Engineering home office support will be used as required to resolve technical issues (i.e., DCNs, requests for clarification or information, etc.) relating to the CFC Design Packages, home office review of vendor submittals, field inspection during construction, support of CAT, and startup and operation of the remediation facilities.

Duratek Services will also provide technical support to the Source Evaluation Board's evaluation of proposals for manufacturing the disposal container for the treated Silos 1 and 2 material.

Jacobs Engineering will provide computer aided drafting and design (CADD) services throughout the entire Silos 1 and 2 Project. Jacobs Engineering will

Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Weeks</i>
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3. WBS ELEMENT CODE 1.1.H.D	4. WBS ELEMENT TITLE/NAME SILOS 1 & 2		
5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/03 - 04/08	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1A1	13. TASK DESCRIPTION (ONE LINE) ENG SUPPORT OF CONST, STRTUP, OPS AND D&D - FFI		

14. ELEMENT TASK DESCRIPTION

be responsible for receiving all "redline" drawings, incorporating design change notices, and maintaining a set of current as-built drawings throughout construction and SOT activities. Jacobs Engineering will interface with the Fluor Fernald Silos 1 and 2 Site Engineering Team to ensure that all "redline" drawing information pertaining to FEMP infrastructure drawings are forwarded in a timely manner and incorporated by FEMP Engineering Services CADD personnel.

Fluor Fernald will be responsible for all inspections, surveillances and audits throughout this project. A graded approach to assessments, inspections, and testing will be used to ensure that resources applied are commensurate with the performance grade or hazard category assigned to the system, structure, or component.

d. WORK SPECIFICALLY EXCLUDED:

Jacobs Engineering Subcontract Services

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5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/03 - 12/07	
12. TASK IDENTIFICATION (WORK PACKAGE) HS1A2	13. TASK DESCRIPTION (ONE LINE) ENG SUPPORT OF CONST, STRTUP, OPS AND D&D - JACOBS		
14. ELEMENT TASK DESCRIPTION			
<p><u>a. ELEMENTS OF COST:</u></p> <p>Subcontracts Materials ODCs</p> <p><u>b. TECHNICAL CONTENT:</u></p> <p>Jacobs Engineering will provide technical support throughout construction, startup, operations, and D&D</p> <p><u>c. SCOPE OF WORK:</u></p> <p>Fluor Fernald and Jacobs Engineering will jointly perform engineering support responsibilities through construction, start-up, operations, and D&D. Silos 1 and 2 Site Engineering will provide a project engineer for each construction contract (i.e., civil, electrical, mechanical) throughout construction, SOT, start-up, and D&D activities. The Silos 1 and 2 Site Engineering Team and Jacobs Engineering home office support will be used as required to resolve technical issues (i.e., DCNs, requests for clarification or information, etc.) relating to the CFC Design Packages, home office review of vendor submittals, field inspection during construction, support of CAT, and startup and operation of the remediation facilities.</p> <p>Jacobs Engineering will provide support to the Fluor Fernald Silos 1 and 2 Site Engineering Team at various points during the Silos 1 and 2 long-lead procurement activities (i.e., review of vendor submittals, inspection during fabrication, inspection at delivery).</p> <p>Jacobs Engineering will provide computer aided drafting and design (CADD)</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Arnold Weeks</i>	

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1. PROJECT TITLE FEMP (DEFENSE)		2. DATE 12/01/2000	Page 2
3. WBS ELEMENT CODE 1.1.H.D	4. WBS ELEMENT TITLE/NAME SILOS 1 & 2		
5. PERFORMING DIV/DEPARTMENT CODE 4303	6. ORIGINATOR NAME/PHONE R. FELLMAN	7. WBS ELEMENT MANAGER R. FELLMAN	
8. BUDGET AND REPORTING NUMBER EW05H3070	9. BUDGET TITLE SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE 04/03 - 12/07	

12. TASK IDENTIFICATION (WORK PACKAGE) HS1A2	13. TASK DESCRIPTION (ONE LINE) ENG SUPPORT OF CONST, STRTUP, OPS AND D&D - JACOBS
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14. ELEMENT TASK DESCRIPTION

services throughout the entire Silos 1 and 2 Project. Jacobs Engineering will be responsible for receiving all "redline" drawings, incorporating design change notices, and maintaining a set of current as-built drawings throughout construction and SOT activities. Jacobs Engineering will interface with the Fluor Fernald Silos 1 and 2 Site Engineering Team to ensure that all "redline" drawing information pertaining to FEMP infrastructure drawings are forwarded in a timely manner and incorporated by FEMP Engineering Services CADD personnel.

Jacobs will provide requested support to Fluor Fernald of all inspections, surveillances and audits throughout this project. A graded approach to assessments, inspections, and testing will be used to ensure that resources applied are commensurate with the performance grade or hazard category assigned to the system, structure, or component.

d. WORK SPECIFICALLY EXCLUDED:

None

SECTION 4

1.0 NARRATIVE

1. PROJECT TITLE: SILOS PROJECT	2. DATE: 04/26/01	3. PBS#: 07
4. WBS ELEMENT CODE: 1.1.H.D	5. WBS ELEMENT TITLE: SILOS 1 AND 2	
6. CAM NAME/ PHONE: ROBERT FELLMAN/DENNIS NIXON	7. CAM SIGNATURE:	
8. ORIGINAL/ CHANGE SCOPE/ PER CP#:	9. CONTROL ACCOUNT: HS1A	

SECTION 4: HS1A – SILOS 1 AND 2

1.0 NARRATIVE

1.1 OVERVIEW

This Closure Plan defines the scope of work to be performed during the Operable Unit 4 (OU4) Silos 1 and 2 Project at the U.S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP) in Hamilton County, Ohio. The overall objectives for this project are the safe transfer of the Silos 1 and 2 material from the Transfer Tank Area (TTA), on-site treatment by a chemical stabilization process, and off-site disposal of the treated Silos 1 and 2 material at the Nevada Test Site (NTS). In order to accomplish manage these objectives, the Silos 1 and 2 Project has been divided into the following tasks (Charge Numbers):

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- Project Oversight (HS1AA);
- Design Data Development (HS1AB);
- ~~Design (HS1AC);~~
- ~~Construction (HS1AD);~~
- ~~Conceptual Design – FFI (HS1AC);~~
- ~~Conceptual Design – Jacobs (HS1AE);~~
- ~~Preliminary Design – FFI (HS1AV);~~
- ~~Preliminary Design – Jacobs (HS1AW);~~
- ~~Final Design – FFI (HS1AX);~~
- ~~Final Design – Jacobs (HS1AY);~~
- ~~Engineering Support of Const., Startup, Ops, and D&D – FFI (HS1A1);~~
- ~~Engineering Support of Const., Startup, Ops, and D&D – Jacobs (HS1A2);~~
- ~~Construction Management (HS1AD);~~
- Subcontracts Miscellaneous (HS1AF);
- Electrical Subcontract (HS1AG);
- Mechanical Subcontract (HS1AH);
- Civil Subcontract (HS1AJ);
- Startup and Readiness (HS1AK);
- Operations and Maintenance (HS1AL and HS1AV);

- Waste Management (HS1AM, HS1AT, and HS1AU);
- Facility Shutdown (HS1AN);
- Decontamination and Dismantlement (HS1AP); and
- Decontamination and Dismantlement Contract ((HS1AR).

1.2 ASSUMPTIONS/EXCLUSIONS

1.2.1 Contracting Strategy

The implementation strategy for the execution of the Silos 1 and 2 remediation activities will utilize the combined strengths of FEMP teaming partners and world class subcontractors for engineering, design, procurement, construction, operations, maintenance, waste packaging and disposition, and decontamination and demolition. Work under this closure plan will be performed using the contracting strategy outlined in **Table 1.2-1**.

1.2.2 Assumptions and Criteria

Throughout this closure plan, assumptions and criteria are documented to facilitate the reader's understanding of the regulatory and technical basis supporting the development of the baseline for the Silos 1 and 2 Project. This section summarizes key assumptions and criteria found in this closure plan that form the basis of the scope of work, schedule, resource and risk management planning. "Assumptions," as used in the context of this closure plan, refer to facts or statements taken for granted and either based upon agreements between projects, demonstrated performances, third party published data or warranted claims. "Criteria," as used in the context of this closure plan, refer to either requirements or general information that form the basis for design.

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~~Additional assumptions and criteria used in this closure plan are identified in Appendix B of this closure plan as appropriate. Only the key overall criteria and assumptions for the Revised Feasibility Study for Silos 1 and 2 are listed below in Table 1-2.2. Table 1-2.2 provides a summary of the key criteria, assumptions, and requirements that are reflected in this closure plan narrative and the basis of estimate.~~

**TABLE 1.2-1
 SILOS 1 AND 2 PROJECT – CONTRACTING STRATEGY**

PROJECT SCOPE	CONTRACT STRATEGY
Project Documentation	Fluor Fernald, Inc. (Fluor Fernald) and Duratek Federal Services will self-perform this scope with full integration with the Jacobs Engineering Design Team.
Design	Jacobs Engineering Design Team will perform this scope as a fully integrated Teaming Partner at their Oak Ridge, TN office.

Design Data Development	Fluor Fernald and Duratek Federal Services will self-perform this scope at the FEMP laboratory and/or at an offsite laboratory that is managed by Duratek (Clemson University, Barnwell, etc.)
Container Development	Fluor Fernald and Duratek Federal Services will define the container requirements and identify commercial availability. Container development, design, testing, and certification, if required, will be performed under a Fixed-Price subcontract. Fabrication, final testing, and delivery will be provided under one or more Fixed-Unit Price subcontracts with a guaranteed minimum.

**TABLE 1.2-1
 SILOS 1 AND 2 PROJECT – CONTRACTING STRATEGY (CONT'D)**

PROJECT SCOPE	CONTRACT STRATEGY	
Remedial Design/ Remedial Action (RD/RA) Deliverables	Jacobs Engineering Group will perform this scope, with Fluor Fernald managing the regulatory agency interface.	
R1- F07- 046	Safety Basis Documentation	Fluor Fernald and Duratek Federal Services will self-perform this scope with full integration with the Jacobs Engineering Design Team. Jacobs Engineering will perform safety basis documentation with integration from Fluor Fernald, Inc.
	Long Lead Procurement	Fluor Fernald, Duratek Federal Services, and Jacobs Engineering will develop equipment performance specifications and multiple bid packages for Fixed-Price contracts to design, fabricate, test, deliver, and provide start-up support. The procurements will likely be developed with options due to administrative procedures and funding constraints i.e., Base Contract to provide vendor design, specifications and performance data, and <i>Option 1</i>) fabrication, testing, delivery, and start-up support.
Construction	Fluor Fernald will act as the General Contractor for the construction of all the Silos 1 and 2 remediation and support facilities. The Project Team will strategically divide the construction into logical bid packages, i.e. by discipline, Civil, Mechanical, and Electrical. Fixed-Price subcontracts will be secured through an Invitation For Bid procurement process. Fluor Fernald will manage and coordinate the subcontractors, the subcontractors will be essentially labor brokers and commodity buyers. Wise Services, Inc. will be utilized for interface work between the Fixed-Price subcontracts. Fluor Fernald will perform Construction Acceptance Testing (CAT) and Integrated CAT (ICAT). Fluor Fernald and Jacobs Engineering will provide engineering support during construction.	
System Operability Testing (SOT)	Fluor Fernald and Duratek Federal Services will self-perform this scope of work.	
Start-up	Fluor Fernald and Duratek Federal Services will self-perform this scope with technical assistance from the equipment manufacturer(s).	
Operational Procedures and Documentation	Fluor Fernald, Duratek Federal Services, and Jacobs Engineering will self-perform this scope of work.	
Training	Fluor Fernald and Duratek Federal Services will self-perform this scope of work.	
Operational Readiness	Fluor Fernald and Duratek Federal Services will self-perform this scope of work.	
Operations	Fluor Fernald and Duratek Federal Services will self-perform this scope of work. Stabilization chemicals will be procured through Indefinite Delivery/Indefinite Quantity Contracts with a fixed unit price and a guaranteed minimum quantity. The waste shipping will be performed on a Fixed-Unit Price subcontracts with a guaranteed minimum quantity.	

**TABLE 1.2-1
 SILOS 1 AND 2 PROJECT – CONTRACTING STRATEGY (CONT'D)**

PROJECT SCOPE	CONTRACT STRATEGY
Laboratory Services	Fluor Fernald will seek Laboratory Services for project-specific analytical procedures to support process operations, waste certification, and decontamination and dismantlement (D&D) through a Fixed-Price/Fixed-Unit Price Contract.
D&D	Fluor Fernald will develop a performance specification for a Fixed-Price subcontract. The procurement will be developed with a base contract to D&D abandoned facilities [i.e., Silos 1, 2, 3, and 4, Radon Treatment System (RTS), Superstructure, etc.], and Option 1) D&D of the Silos 1 and 2 Remediation Facilities. <u>Silo 3 remediation facility, RCS, and TTA.</u>

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**TABLE 1.2-2
 SUMMARY OF ASSUMPTIONS, CRITERIA, AND REQUIREMENTS**

ITEM NO.	DESCRIPTION
ADMINISTRATIVE	
A1	All Silos 1 and 2 material, including heel material, will be removed from the silos and transferred into controlled interim storage tanks (50 wt% solids) under the Accelerated Waste Retrieval (AWR) project for future transfer and treatment during the full-scale remediation. The transfer equipment from the interim storage TTA will be installed under the AWR Project. This project will be completed prior to startup of the Silos 1 and 2 remediation facilities.
A2	The NTS has officially documented that the Universal Treatment Standards would not be imposed as part of the NTS waste acceptance criteria (WAC) for disposal of the treated Silos 1 and 2 material.
REGULATORY	
R1	The treatment of Silos 1 and 2 material will be conducted in accordance with the clean-up objectives and requirements, identified in the "Record of Decision (ROD) for Remedial Actions at Operable Unit 4", December 1994, as modified by the "Record of Decision Amendment for Operable Unit 4 Silos 1 and 2 Remedial Actions," July 2000.
R2	Activities described in this Closure Plan shall be performed in accordance with all applicable regulatory requirements and consistent with any agreements, Orders, permits, or similar documents identified in this Closure Plan. These include, but are not limited to, the applicable or relevant and appropriate requirements (ARARs) and "to be considered" (TBCs) criteria identified in the OU4 ROD, as modified by the ROD Amendment and the Amended Consent Agreement.
R3	For purposes of proper packaging and transportation of the Silos 1 and 2 material, the material is governed by the U.S. Department of Transportation (DOT) regulations under 49 Code of Federal Regulations (CFR) Subtitle B, Chapter I, Subchapter C, "Hazardous Materials Regulations."
R4	For proper transportation, the Silos 1 and 2 material is classified as low specific activity – type II (LSA-II) material.

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**TABLE 1.2-2
 SUMMARY OF ASSUMPTIONS, CRITERIA, AND REQUIREMENTS (CONT'D)**

ITEM NO.	DESCRIPTION
R5	For purposes of waste management and proper disposal, the Silos 1 and 2 material is classified as "by-product material," resulting from the recovery of uranium from ore concentrates as defined under Section 11(e)(2) of the Atomic Energy Act of 1954. It is specifically exempt, as defined, from regulation as solid waste under Resource Conservation and Recovery Act, as amended (RCRA) 40 CFR Part 261.4(a)(4).
R6	U.S. Environmental Protection Agency (EPA) Reviews – Review comments that are preference or excess of the Silos 1 and 2 contract requirements will not be implemented without directive changes from the DOE contracting Officer and the Fluor Fernald contracting Administrators. These directive changes are subject to compensation to the Silos 1 and 2 contractors and to Fluor Fernald.
GENERAL	
G1	Chemical stabilization is defined as a non-thermal treatment process that mixes the Silos 1 and 2 material (including BentoGrout™) with a variety of chemical additive formulations (e.g., lime, pozzolans, gypsum, portland cement, or silicates) to accomplish chemical and physical binding of the constituents of concern (COCs). These processes provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix. Thermal techniques may be used for dewatering the feed stream prior to treatment.
G2	It is assumed that the full scale treatment facility will be designed and sized to process the material with 100% plant availability. The full-scale treatment facility will be designed and sized to process the Silo 1 and 2 material in 250 processing days (at full capacity) within a one-year (365 days) operations period, resulting in anominal 70% plant availability based on schedule.
G3	The solids content of the Silos 1 and 2 material slurry delivered to the full-scale treatment facility from the TTA is expected to be in the range of 10-30 wt% solids. Equipment sizing will be based upon 15 wt% solids in the slurry.
G4	The volume of Silos 1 and 2 material (including BentoGrout™) required to be processed is estimated to be 8,890 yd ³ and weigh 9,955 tons (dry weight basis).
G5	Fluor Fernald will be responsible for snow removal from all FEMP roadways, sidewalks, and parking lots including the Silos 1 and 2 work area at no cost to the project.
G6	Air sampling and monitoring at the FEMP site boundary and existing on-site monitoring outside of the Silos 1 and 2 Project boundary will be the responsibility of Fluor Fernald at no cost to the project.
G7	The Silos 1 and 2 Project Execution Plan will be required to be updated annually.
G8	The Engineering and Construction Document Control (ECDC) remains centralized and will provide document control for the project.
G9	Trailers T-57 and T-58 and their furniture are available to the Silos 1 and 2 Project beginning January 2004 through August 2007. These trailers will be used to house Silos Waste Management personnel supporting container receiving, inspections and document preparation. The D&D of T-57 and T-58 will be managed by PBS06, D&D.

R1- F07- 047	G10	The contract Review Board is a centralized organization.
	G11	The Building 30/45 parking lot will be unavailable for parking beginning September 2003. The parking lot will be used as a construction staging area and empty container receiving area.
	G12	All Contracts, unless otherwise specified, will be incrementally funded.

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**TABLE 1.2-2
 SUMMARY OF ASSUMPTIONS, CRITERIA, AND REQUIREMENTS (CONT'D)**

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ITEM NO.	DESCRIPTION
DESIGN	
DSN1	<p>Releases from all silos activities (of which those described in this text are only a part) shall add no more than 0.5 picocuries per liter (pCi/L) radon concentrations to the fenceline.</p> <p>Basis: The current limit is 3.0 pCi/L above background on an annual average. The latest revised limit at proposed 10 CFR Part 834, identified as a TBC is 0.5 pCi/L above background annual average. The limits being applied elsewhere (i.e., Silo 3, AWR, etc.) specify that radon emissions from Silos 1 and 2 remediation must be limited such that they result in a contribution (annual average) of no more than 0.5 pCi/L to the fenceline concentrations.</p>
DSN2	The baseline waste loading and density of the treated Silos 1 and 2 material is (30 wt% dry weight basis) 1.52 grams per cubic centimeter (g/cm ³) with 5% air pockets assumed, bulk density is 1.44 g/cm ³ .
DSN3	Maximum delivery flow rate of the slurry from the TTA to the remedial facility shall be 5,900 pounds per hours (lb/hr) on a dry weight basis.
DSN4	The Silos 1 and 2 slurry (with BentoGrout™) settles to 50% solids over a period of 24 hours.
DSN5	The existing RCS designed, constructed and operated as part of the AWR Project provides a maximum of 500 cubic feet per minute (scfm) capacity to support the full-scale treatment facility. Facility designs requiring more than 500-scfm capacity would require additional capacity to the RCS.
DSN6	The DOE-FEMP, under 10 CFR Part 835, has established that an area in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 100 millirem per hour (mrem/hr) at 30 cm from a radiation source (containerized Silos 1 and 2 material) must be classified as a high radiation area. The Silos Project has a complete table of radiation zones with allowable stay times, etc.
DSN7	<p>The off-gas to the RCS shall be of the following quality:</p> <ul style="list-style-type: none"> - 90°F and 0.022 lb water/lb dry air maximum; - 20 ppm (vol) SO_x, maximum; - 20 ppm (vol) NO_x, maximum; - 15% (vol) CO₂, maximum; - 40 parts per million (ppm) organics, maximum; and - Filtered or scrubbed for particulates
DSN8	The maximum allowable average airborne radon concentration in a normally occupied work area is 4 pCi/L with a maximum of 30-pCi/L instantaneous radon concentration.

DSN9	<p>Water effluent will be collected, sampled, and analyzed prior to being released to the FEMP Advanced Waste Water Treatment Facility (AWWT). The water effluent will meet, at a minimum, the following requirements:</p> <ul style="list-style-type: none">10 gallons per minute (gpm) maximum flow rate (assuming no other silos function is operating at this time as 10 gpm is the limit for OU4 in its entirety);1,000 ppm total suspended solids (Total dissolved solids are not a concern because the 10 gpm wastestream will be significantly diluted by the much larger wastewater streams at the AWWT); andmetals and radionuclides concentrations and quantities equal to or less than the discharge limits.
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**TABLE 1.2-2
 SUMMARY OF ASSUMPTIONS, CRITERIA, AND REQUIREMENTS (CONT'D)**

ITEM NO.	DESCRIPTION
DSN10	Only Design Change Notices (DCNs), which revise documents approved by the EPA, must be submitted for review and approval to the EPA. The EPA/Ohio EPA (OEPA) will review/approve DCNs within one (1) working days.
CONSTRUCTION	
CSN1	The construction contractors shall be required to utilize the labor force to construct the remedial facilities in accordance with the FEMP's Greater Cincinnati Building and Construction Trades Council (GCBCTC) Labor Agreement.
CSN2	Construction Management Approach – Fluor Fernald will self-perform as the general contractor. Develop Invitation for Bid (IFB) for civil, mechanical/piping, electrical/instrumentation. Survey work for redlines will be Fluor Fernald scope. No change to FEMP permitting requirements. Lock and tag procedures will be implemented with current exemptions provided to construction equipment.
CSN3	Safe Work Plans – Matrix and Safe Work Plan detailed draft outline would be written by Fluor Fernald and provided in the IFB. Approval would require craft input.
CSN4	CAT Testing – Fluor Fernald will perform field Quality Control (QC). Will require geotechnical subcontract such as ATC.
CSN5	Soil Contamination – It is planned that 2700 ft ³ of soil contamination exists in the Silos 1 and 2 work zone.
CSN6	Utilities – Communications and electricity shall be run aboveground. All other utilities shall be run underground. Breathing air system will be provided, if applicable. No emergency backup will be provided.
CSN7	Boundary Fencing – Orange snow fencing, made of high-density polyethylene, will be adequate for boundary controls.
CSN8	It is assumed that a 25% 10% overtime factor will be applied to Construction Contract Management manhours to support the subcontractor.
OPERATIONS	
O1	It is assumed that a maximum of 1% of the treated Silos 1 and 2 material process will fail to meet the NTS WAC for disposal and require rework or macroencapsulation prior to alternate off site disposal. No on-site rework of this material is planned at this time. A viable path forward will be defined at the time the RD Package is submitted to EPA.
O2	Controlled access and egress is provided to all equipment requiring routine inspection and/or operation attention.
O3	DOE will maintain necessary FEMP site infrastructure, roads, parking lots, area lighting, storm water control, utilities, and general support functions such as the Emergency Operations Center (EOC), AWWT, medical, security, fire department, human resources, etc. These expenses are not included in the estimates.
O4	The operating schedule is based on two (2) 12-hour shifts on a 4-day rotation, 24 hours/day, 7 days/week, for 365 days at 70% availability.
O5	Fluor Fernald will provide the operation and maintenance support work force utilizing labor in accordance with the labor agreement between Fluor Fernald and the Fernald Atomic Trades and Labor Council (FAT&LC).
O6	It is assumed that solid secondary waste from the Silos 1 and 2 material treatment operations will meet the NTS WAC. Solid secondary waste from operations will be shipped via truck and disposed at the NTS.

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**TABLE 1.2-2
 SUMMARY OF ASSUMPTIONS, CRITERIA, AND REQUIREMENTS (CONT'D)**

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ITEM NO.	DESCRIPTION
MAINTENANCE	
M1	Planned maintenance, preventative and reparative, is performed in accordance with "as low as reasonably achievable" (ALARA) guidelines.
M2	Controlled access and egress is provided for personnel, tools and repair parts to all equipment.
M3	Adequate change rooms shall be provided for donning and doffing personal protective equipment (PPE).
M4	The maintenance shop supporting the Silos 1 and 2 Project will be constructed during the AWR Project. Responsibility for its operation will be turned over to the Silos Project upon completion of the AWR Project.
STARTUP	
SU1	Basic Qualification – Sufficient quantities of the worker classifications exist onsite. No additional fundamental training (such as chemical operator training) will be required by the Silo 3 Project Silos 1 and 2 to create the necessary pool of qualified workers to bid this job.
STARTUP REVIEW	
SR1	Operational Readiness Review (ORR) – One ORR will be performed prior to the start of remedial action activities. The DOE ORR will commence immediately upon completion of the FEMP ORR. The entire ORR process will take 99 calendar days or less.
SR2	Standard Startup Reviews (SSRs) – There will be no separate SSRs for shipment.
PACKAGING	
P1	The shielding necessary to achieve DOT shipping requirements will be provided by the container, if feasible. Shielding of the conveyance may be used to ensure compliance with DOT requirements.
P2	The shipping/disposal packages will be filled to 90% of the available internal volume with treated Silos 1 and 2 material.
P3	Packaging for the Silos 1 and 2 material LSA-II must, at a minimum, meet the design requirements for an Industrial Packaging – Type 2 (IP-2) container (49 CFR Part 173.411) and the design requirements for the NTS WAC.
P4	The container will be designed to meet the following radiation level limitations under 49 CFR Section 173.441 during transportation: <ul style="list-style-type: none"> - 200 mrem/hr on the external surface of the package; - 200 mrem/hr at any point on the outer surfaces of the transport vehicle; - 10 mrem/hr at any point two meters from the outer lateral surface of the transport vehicle, excluding the top and underside of the vehicle; and - 2 mrem/hr in any normally occupied space.
P5	The maximum gross weight of a filled container cannot exceed 20,000 lb in order to allow shipment of 2 containers per truck.
TRANSPORTATION	
T1	Packages of treated Silos 1 and 2 material would be transported under "exclusive use" conditions by direct truck shipment to the NTS.

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TABLE 1.2-2
SUMMARY OF ASSUMPTIONS, CRITERIA, AND REQUIREMENTS (CONT'D)

ITEM NO.	DESCRIPTION
T2	The maximum gross weight of each truck shipment [full container(s) of treated Silos 1 and 2 material] shall not exceed 42,000 lb. The 42,000-lb limit is based on the FEMP Procedure PT-0006, "Packaging Low-Level Radioactive Waste in ISO Containers." This limit was established to meet the DOT limit of 80,000 lb for over-the-road shipments when truck, trailer, fuel, tie-down equipment, etc., are factored into gross weight.
T3	The FEMP Building 82, RIMIA, will be eliminated in FY05. A truck trailer receiving and shipping area, with truck weigh scales will be constructed adjacent to the west access road to the Silos Area.
DISPOSAL	
D1	The treated Silos 1 and 2 material will be disposed at the NTS by land burial. All costs associated with special considerations for the disposal configuration at the NTS (e.g., at a proper depth of burial) and with appropriate engineering controls (e.g., cap) will be the responsibility of the NTS.
D2	It is assumed that the Silos 1 and 2 material is treated to meet the NTS WAC [e.g., Toxicity Characteristic Leaching Procedure (TCLP) metals under RCRA, no free liquids, etc.] for disposal.
D3	The disposal fee charged by the NTS is based upon the exterior volume of the container of waste being buried. The current disposal fee rate quoted by the NTS is \$7.50 per cubic foot (ft ³).
DECONTAMINATION AND DISMANTLEMENT (D&D)	
DD1	The D&D scope includes the removal of underground concrete and utilities of the remediation facilities.
DD2	It is assumed that all debris from the D&D of the Silos 1 and 2 material treatment facility meets either the NTS WAC or On-site Disposal Facility (OSDF) WAC.
DD3	D&D scope does not include soils remediation within the OU4 boundary. Remediation of the soils in this area has been planned and budgeted under the Soil and Water Projects – Area 7 Soils Project.
DD4	The D&D scope includes the removal and disposal of the Silos 1, 2, 3, and 4, including the Decant Sump Tank and old RTS. The scope also includes the removal of the Silo 3 remediation facilities.
DD5	The D&D scope includes D&D of the TTA and the RCS installed under the AWR Contract, as well as, the new superstructure over Silos 1 and 2. The D&D scope also includes the remaining vitrification pilot plant facility.
DD6	The D&D scope does not include the High Nitrate Storage Tank. Remediation of the High Nitrate Storage Tank is part of the AWWT D&D Scope.
DD7	The D&D of the K-65 trench, including its piping, is planned under the PBS-06, "Soils" Closure Plan.
DD8	It is assumed that an adequate supply of roll-off boxes will be available to support D&D activities.
DD9	Laboratory services will be outsourced.
DD10	All Excavated soils during D&D of the Silos 1 and 2, the Decant Sump Tank and K-65 Track will be backfilled into the excavation, as a temporary measure until final remediation by PBS06, "Soils."

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**TABLE 1.2-2
 SUMMARY OF ASSUMPTIONS, CRITERIA, AND REQUIREMENTS (CONT'D)**

ITEM NO.	DESCRIPTION
COST	
C1	The planned average cost of shipping treated Silos 1 and 2 waste to the NTS is \$4,600 per truck shipment, two containers per shipment, which results in a shipping cost of \$2,300 per container.
C2	A sales tax of 6.5% 6% for Hamilton County, Ohio is applied to the estimated equipment and materials.
C3	Silos 1 and 2 full-scale remediation project indirect costs are estimated based on current FEMP project experience and site guidelines.
SAFETY & HEALTH	
SH1	Fire Protection – Due to the temporary nature of any containment constructed to support this project, no fire sprinkling will be required.
SH2	Occupational Safety – Ra-226 is the contaminant of concern for purposes of worker protection. No heavy metals contained in the Silos 1 and 2 material will drive more stringent worker protection requirements. Beryllium monitoring is not necessary for workers on Silos 1 and 2. Lead monitoring is required for some workers on Silos 1 and 2. Heat and cold stress controls will be required. Physiological monitoring may be used to calculate stay times.
SH3	Emergency Preparedness – will be supplied by FEMP services in the event of an emergency. No disaster drills are planned for this project, however, for purposes of startup, an emergency operations drill may be conducted at the project.

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1.2.3 DOE Order 413.3

~~The schedule and resource planning for the Silos 1 and 2 Project is based upon the following project management strategy to comply with DOE Order 413.3.~~

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~~The principal goal of DOE Order 413.3 is to ensure that DOE delivers capital assets on schedule, within budget, fully capable of meeting mission performance and environmental, safety, and health standards and in compliance with all ARARs and TBCs. While many aspects of the project management process identified by DOE Order 413.3 are already embedded within existing FEMP Programs and Procedures, and are identified as Fernald Closure Contract (DE AC24 01OH20115) requirements, it is recognized that several project management tools identified by DOE Order 413.3 can be adopted to strengthen the project management approach and execution strategy for the Silos 1 and 2 Project.~~

~~The Silos 1 and 2 Project team has developed a tailored approach consistent with the intent of DOE Order 413.3 by integrating the following activities into the Silos 1 and 2 Project baseline:~~

- ~~• Critical Decision Points; and~~
- ~~• Independent Review.~~

The following section discusses how these components of DOE Order 413.3 will be used to strengthen this project.

1.2.3.1 Critical Decision Points

DOE Order 413.3, Chapter 1, defines a critical decision as "...a formal determination or decision at a specific point in a project phase that allows the project to proceed to the next phase and commit resources." The Silos 1 and 2 Project has adopted the following Critical Decision (CD) milestones identified for environmental restoration projects in the guidance documents, for the remainder of the Silos 1 and 2 Project.

- ~~CD 2/3 (combined), Approve Performance Baseline. Start field work;~~
- ~~CD 4, Project Closeout. Prerequisite is completion of all administrative and closeout activities.~~

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~~Prior to the completion of the Silos 1 and 2 Project Final Design Package, the CD 2/3 milestone has been established (Section 1.5.3.1.3 Section 1.5.3, Subtask 4). Similarly, prior to project closeout (Section 1.5.1.2.4 Section 1.5.1, Task 2, Subtask 5), the CD 4 milestone has been established. At these decision points, the Silos 1 and 2 Project Team will perform a self-assessment of the project's maturity using the DOE Environmental Management 6 (EM-6) Project Definition Rating Index (PDRI). The PDRI assessments will be forwarded to DOE to support DOE's evaluation of the project's maturity.~~

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~~The EM-6 PDRI assessment process was previously used by the Silos 1 and 2 Project team in April 2000 to assess the project's "readiness" to proceed beyond the CD 1 project planning milestone. According to DOE EM-6 guidance for Environmental Restoration Projects, the PDRI is derived from an evaluation checklist containing roughly 60 criteria categorized within five (5) topical areas: Cost, Schedule, Scope/Technical, Management Planning and Control, and External Factors. The criteria will be evaluated in a self-assessment format by the Silos 1 and 2 Project team participants, who assign a numerical "maturity level" value for each criteria. The assessor's numerical maturity level value is then multiplied by the corresponding DOE-assigned weighting factor for the criterion, yielding a score for that criterion. The scores for the criteria are summed over the five (5) topical areas and an overall project rating for the particular CD is derived. This rating will be submitted and validated by DOE-FEMP.~~

~~These Critical Decision points are additional tools that DOE-FEMP will have available to supplement its own determination whether or not the project is ready to move forward based on its active participation during the development and review of the following Silos 1 and 2 Project documentation:~~

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- ~~Technical Baseline;~~
- ~~Preliminary Safety Analysis Report;~~
- ~~Final Safety Analysis Report;~~

- ~~Conceptual Design Package;~~
- ~~Preliminary Design Package*;~~
- ~~Final Design Package*;~~
- ~~Container Design Package;~~
- ~~Operational Readiness Review;~~
- ~~Remedial Design Work Plan*;~~
- ~~Remedial Design Package*;~~
- ~~Remedial Action Work Plan*;~~
- ~~Remedial Action Package*;~~
- ~~Transportation & Disposal Plan*;~~
- ~~D&D Implementation Plan*;~~
- ~~Monthly Variance Analysis Reports; and~~
- ~~Project Procurement Packages [IFB, Request for Proposal (RFP), Consent Packages].~~

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1.2.3.2 Independent Review Teams

The Silos 1 and 2 Project team has assumed that DOE FEMP will identify an independent review team, who will perform reviews of the Silos 1 and 2 project documentation in parallel to DOE FEMP's review periods. The Silos 1 and 2 Project team assumes that DOE FEMP will serve as a focal point for all communications with the independent review team, screen all comments and only forward appropriate comments to Fluor Fernald for resolution.

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In addition, it is assumed that the DOE FEMP will continue to employ the use of the Critical Analysis Team to serve as an independent technical resource to perform concurrent reviews on DOE FEMP selected documents to review and comment on some of the aforementioned documentation denoted by the asterisk (*).

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1.2.3 DOE Order 413.3

The schedule and resource planning for the Silos 1 and 2 Project is based upon the following project management strategy to comply with DOE Order 413.3. The principal goal of DOE Order 413.3 is to ensure that DOE delivers capital assets on schedule, within budget, fully capable of meeting mission performance and environmental, safety, and health standards and in compliance with ARARs and TBCs. Many aspects of the project management process identified by DOE Order 413.3 are already embedded within existing FEMP Programs and Procedures, and are identified as Fernald Closure Contract (DE-AC24-01OH20115) requirements.

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The Silos 1 and 2 Project team has developed a tailored approach consistent with the intent of DOE Order 413.3 by integrating the following activities into the Silos 1 and 2 Project baseline:

- Critical Decision Points, and
- Independent Review.

The following section discusses how these components of DOE Order 413.3 will be used to strengthen this project.

Critical Decision Points

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DOE Order 413.3, Chapter 1, defines a critical decision as "... a formal determination or decision at a specific point in a project phase that allows the project to proceed to the next phase and commit resources." The Silos 1 and 2 Project has adopted the following Critical Decision (CD) milestones for traditional projects, as proposed by DOE-FEMP:

- CD-1, Placement of the Project on the National Priorities List (complete);
- CD-2, Conceptual Design/Cost Estimate Submitted to DOE;
- CD-3, Final Design/Cost Estimate Submitted to DOE, and
- CD-4, Approval of DOE ORR.

No additional submittals to DOE will be required specifically to meet the requirements of DOE Order 413.3. The independent review function identified in DOE Order 413.3 will be satisfied by the DOE Critical Analysis Team (CAT) review of the Conceptual Design Package and Final Design Package. CD-4 will be met through the DOE ORR for startup of the Silos 1 and 2 facility.

Work will proceed in parallel with DOE CAT review of the conceptual design and final design packages. Upon submittal of the Conceptual Design Package to DOE, Fluor Fernald will commence preliminary design activities. Fluor Fernald will also commence bid and award of construction contracts during DOE review of the Final Design Package. Operations, however, will not commence until completion of the DOE ORR.

1.2.4 Submittals to DOE

All Silos 1 and 2 documents requiring DOE review and approval have been identified in this Closure Plan (Appendix A). Subsequently, the duration of the DOE review and approval cycles are also identified by this closure plan and has been incorporated into the Silos 1 and 2 project schedule. The following text summarizes the Silos 1 and 2 document submittal process involving DOE:

- Silos 1 and 2 documents requiring DOE review and approval will be formally transmitted to DOE by Fluor Fernald.

- DOE will submit all review comments and document approvals to Fluor Fernald within the designated cycle.
- The Silos 1 and 2 Project team will assess DOE's comments to determine which organization should prepare a response.
- If comments require clarification or amplification, Fluor Fernald will notify DOE.
- The Silos 1 and 2 Project Team will provide a comment response document to DOE, which will provide for each comment a restatement of comment, a response to the comment, and an identification of the action to be taken on the document to reflect the response.
- It may or may not be necessary to submit a revised document following the comment response document. Change pages may be submitted in lieu of a complete revision of the document or submittal.

1.2.5 Exclusions

No exclusions have been identified for the Silos 1 and 2 Project.

1.2.6 Government Furnished Equipment

During the performance of this project, it is assumed that the following government equipment will be furnished at no expense to the project.

**TABLE 1.2-3
 GOVERNMENT FURNISHED EQUIPMENT AND SERVICES AND SERVICES**

R1- F07- 051	QUANTITY	DESCRIPTION	SCHEDULE	
			START	END
	3 6	Fork Trucks	February 2004	February 2008
	3 2	Taylor – Fork Trucks	April 2004	February 2008
	1	Bus – (30-40 Passenger)	February 2004	February 2008
	2	Passenger Vans (10-12 Passenger)	February 2004	February 2008
	2	Electric Carts	February 2004	February 2008
	2	Yard Trucks – (Tow Truck Trailers)	March 2005	August 2007
	1	RIMIA Truck Scale	May 2004	February 2008
	1	NTS Facility Available for Disposal	May 2006	May 2007

1.3 DRIVERS

~~During the performance period of this project, there will be other project activities occurring adjacent to the Silos 1 and 2 Project boundaries under separate contracts. Fluor Fernald, will be responsible for integration and coordination of field activities between the contractors. The Silos 1 and 2 Project Team will participate in work coordination meetings with corresponding project teams and coordinate work tasks accordingly through Fluor Fernald, with all other contractors. The following is a list of known projects expected to be in progress during the performance of this project that will require some degree of interface:~~

- ~~• Waste Pits Remedial Action Project This project is located to the north and east of the Silos 1 and 2 Project work zone area. This project involves the remediation of the waste pits comprising Operable Unit 1. The project uses the Infrastructure road for deliveries.~~
- ~~• AWR Project This project is located west of the Silos 1 and 2 Project work zone area. The project scope involves the removal and transfer of material from Silos 1 and 2 and the decant sump tank to temporary storage tanks and the construction of a Radon Control System to control the release of radon from the staged Silos 1 and 2 material. This facility will be turned over to the Silos 1 and 2 Project. Its waste transfer system will supply the feed material to the Silos 1 and 2 treatment facility. The RGS will remain operational during the Silos 1 and 2 Remediation Project.~~
- ~~• Silo 3 Project This project is located adjacent to north of the Silos 1 and 2 Project Work Zone area. It will involve the removal, treatment, packaging, and transfer of material from Silo 3 to the Waste Pits Remedial Action Project for shipment to Envirocare. Utilities, traffic and personnel access will have to be closely coordinated between the two projects.~~
- ~~• Vitrification Pilot Plant This facility is adjacent and north of the Silos 1 and 2 Project work zone area. This facility will be converted to house the Maintenance Shop which will serve as a common support facility for the AWR, Silo 3, and Silos 1 and 2 Project. In addition, existing areas within this facility, such as the electrical room, will provide power and communications for the various on going silos projects.~~
- ~~• The South Field Extraction This project is not located in the general vicinity of the Silos 1 and 2 Project work zone area but has a potential impact on the Silos 1 and 2 remediation Contractor. The South Field Contractor will be using the Haul Road, East of the Silos 1 and 2 Project work zone area, to transfer potentially contaminated soils from its location, north to the OSDF.~~

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~~The development of the Silos 1 and 2 Project safety basis documentation shall be coordinated with these projects. Unreviewed safety questions (USQs) may arise between the projects whose resolution must not only be integrated into the approved safety basis for the Silos 1 and 2 Project, but each other projects' safety basis as well.~~

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The AWR Project was initiated in 1997 as part of the emerging risk management strategy for the Silos Project. The successful completion of the AWR Project would reduce the technical risk associated with the mobilization and transfer of the in situ Silo 1 and 2 material in parallel to the stabilization operations. It is assumed that the construction and Phase II start-up of the new RCS and the complete transfer of Silos 1 and 2 material to the TTA must occur prior to beginning Silos 1 and 2 SOT and treatment operations must occur prior to the beginning of Silos 1 and 2 treatment operations.

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The Silos Project must complete D&D activities before the Soils Project can complete Area 7 Soil Remediation activities.

1.4 PROJECT PHYSICAL DESCRIPTION

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~~The Silos 1 and 2 Project will consist of the TTA, the treatment facility, and the RCS. The TTA will be used for the storage of Silos 1 and 2 material and decant sump material prior to treatment. The treatment facility will consist of a slurry receipt system to receive the transferred material from the TTA tanks, a chemical stabilization facility to treat Silos 1 and 2 material, and a system to containerize the treated (stabilized) material. The treatment facility will also have an interim storage area for curing and staging the treated material while waiting approval for disposal and an air emissions control system for control of radionuclide particulate emissions from the treatment process. Both the TTA and the treatment facility are connected to the RCS for control of radon emissions from the remediation process. The containers will be staged in an outdoor storage area prior to being loaded onto truck trailers for shipment to the NTS.~~

~~Chemical stabilization is defined as a non-thermal treatment process that mixes the Silos 1 and 2 material (including BentoGrout™) with a variety of chemical additive formulations (e.g., lime, pozzolans, gypsum, portland cement, or silicates) to accomplish chemical and physical binding of the constituents of concern. These processes provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix.~~

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In an area south of the existing FEMP AWWT Facility, the Silos 1 and 2 Project will be responsible for the design, construction, and D&D of temporary gravel staging areas adjacent to either side of the access road leading to the Building 30/45 parking lot. The existing areas will be cleared, grubbed, regraded, and sized to support the drop-off of empty truck trailers and the staging of 50 to 60 truck shipments bound for the NTS on a weekly basis. The existing truck scale adjacent to the RIMIA Facility (FEMP Building No. 81) will be relocated to this new area. It is assumed that an existing doublewide trailer (T-57) and office equipment will be relocated to this area to serve as office space for the Silos 1 and 2 shipping operations.

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The Silos 1 and 2 Project will consist of the TTA, the treatment facility, and the RCS. The TTA will be used for the storage of Silos 1 and 2 material and decant sump material prior to treatment. The treatment facility will consist of a slurry receipt system to receive the transferred material from the TTA tanks, a chemical stabilization facility to treat Silos 1 and 2 material, and a system to containerize the treated (stabilized) material. The treatment facility will also have an interim storage area for curing and staging the treated material while waiting approval for disposal and an air emissions control system for control of radionuclide particulate emissions from the treatment process. Both the TTA and the treatment facility are connected to the RCS for control of radon emissions from the remediation process. The containers will be staged in an outdoor storage area until they are ready to be loaded onto truck trailers for shipment to the NTS.

Chemical stabilization is defined as a non-thermal treatment process that mixes the Silos 1 and 2 material (including BentoGrout™) with a variety of chemical additive formulations (e.g., lime, pozzolans, gypsum, portland cement, or silicates) to accomplish chemical and physical binding of the constituents of concern. These processes provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix.

The Silos 1 and 2 Project will require the construction of an infrastructure to support the following O&M and Waste Management activities:

• Deliveries

• Access control of all Silos 1 and 2 deliveries and of all truck shipments;

• Weighing of all incoming bulk chemical deliveries;

• Weighing of all outgoing bulk chemical deliveries;

• Access of 4 to 5 truck deliveries of containers to the Silos 1 and 2 Container Staging Area (Building 30/45 parking lot);

• Temporary staging of 12 to 15 daily flatbed trailer deliveries; and

• Receipt inspection of empty trailer deliveries.

• Shipment

- Weighing of 12 to 15 daily truck shipments;
- Staging of 12 to 15 daily flatbed trailers awaiting final inspection; and
- Staging of 12 to 15 daily truck shipments certified for shipment to the NTS.

• Other

- Segregation of trailers requiring repair or maintenance.

The Silos 1 and 2 Project will construct an access road, truck trailer staging area, container staging area, truck-scale facility, and access control facility as part of the infrastructure.

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Access Road

The Silos 1 and 2 Access Road improvements will provide direct truck access from the main entrance to the Silos 1 and 2 remediation facilities. Approximately 4,000 feet of roadway improvements will be constructed along the south parking lot and stormwater retention basin. The new roadway will connect to the existing Haul Road at the truck washing station. It is assumed that the existing Haul Road will be patched and resurfaced at this time.

Truck Trailer Staging Area

The Silos 1 and 2 Project will provide a truck trailer staging area with approximately 100,000 square feet (2.5 acres) of space and a capacity to store up to 100 truck trailers at any given point in time.

The truck trailer staging facility will be bounded to the west by the existing Haul Road and to the east by the existing access road to the Silos 1 and 2 Container Staging Area (Building 30/45 parking area). The trailer staging facility will have perimeter lighting and an office trailer to house trailer inspection and waste shipping personnel.

Currently, the site of the proposed Truck Trailer Staging Area is covered by a pine tree forest. The pine trees will be cut down and mulched. The mulch will be reused at the FEMP for habitat reconstruction. The entire area will be cleared and regraded, and a 12-inch compacted gravel base will be installed to create the staging area.

Container Staging Area

The Building 30/45 parking lot will be turned over to the Silos Project to be used as the Container inventory buffer storage area. Truck deliveries of containers will enter the staging area from the new access roadway. It is assumed that a minimum of 300 containers will be stored in this area to serve as a buffer for disruptions in supplier deliveries.

Truck-scale Facility

Adjacent to the Truck Trailer Staging Facility and along the new Silos Access Road, the RIMIA facility truck-scale will be relocated by others. A trailer will be installed to house scale attendants and waste management personnel to finalize shipping paperwork. Overhead power will be extended to the Truck-scale Facility.

Access Facility

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Adjacent to the new Silos Access Road entrance, a trailer will be installed to serve as an access control. Security personnel will be located at this facility to sign-in drivers and inspect shipments. Overhead power for this facility will be extended from Willey Road.

In addition to the remediation of Silos 1 and 2 material, the project will consist of the safe shutdown and D&D of the Silos 1 and 2 treatment facility and support facilities, including the TTA and the RCS. The object of safe shutdown will be to place the facilities in a controlled state ready for dismantlement.

Project Interface

During the performance period of this project, there will be other project activities occurring adjacent to the Silos 1 and 2 Project boundaries under separate contracts. Fluor Fernald, will be responsible for integration and coordination of field activities between the contractors. The Silos 1 and 2 Project Team will participate in work coordination meetings with corresponding project teams and coordinate work tasks accordingly through Fluor Fernald, with all other contractors. The following is a list of known projects expected to be in progress during the performance of this project that will require some degree of interface:

- Waste Pits Remedial Action Project - This project is located to the north and east of the Silos 1 and 2 Project work zone area. This project involves the remediation of the waste pits comprising Operable Unit 1. The project uses the Infrastructure road for deliveries.

- AWR Project – This project is located west of the Silos 1 and 2 Project work zone area. The project scope involves the removal and transfer of material from Silos 1 and 2 and the decant sump tank to temporary storage tanks and the construction of a Radon Control System to control the release of radon from the staged Silos 1 and 2 material. This facility will be turned over to the Silos 1 and 2 Project. Its waste transfer system will supply the feed material to the Silos 1 and 2 treatment facility. The RCS will remain operational during the Silos 1 and 2 Remediation Project.

- Silo 3 Project – This project is located adjacent to north of the Silos 1 and 2 Project Work Zone area. It will involve the removal, treatment, packaging, and transfer of material from Silo 3 to the Waste Pits Remedial Action Project for shipment to Envirocare. Utilities, traffic and personnel access will have to be closely coordinated between the two projects.

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- Vitrification Pilot Plant – This facility is adjacent and north of the Silos 1 and 2 Project work zone area. This facility will be converted to house the Maintenance Shop which will serve as a common support facility for the AWR, Silo 3, and Silos 1 and 2 Project. In addition, existing areas within this facility, such as the electrical room, will provide power and communications for the various on-going silos projects.

- The South Field Extraction – This project is not located in the general vicinity of the Silos 1 and 2 Project work zone area but has a potential impact on the Silos 1 and 2 remediation Contractor. The South Field Contractor will be using the Haul Road, East of the Silos 1 and 2 Project work zone area, to transfer potentially contaminated soils from its location, north to the OSDF.

The development of the Silos 1 and 2 Project safety basis documentation shall be coordinated with these projects. Unreviewed safety questions (USQs) may arise between the projects whose resolution must not only be integrated into the approved safety basis for the Silos 1 and 2 Project, but each other projects' safety basis as well.

In addition to the remediation of Silos 1 and 2 material, the project will consist of the safe shutdown and D&D of the Silos 1 and 2 treatment facility and support facilities, including the TTA and the RCS. The object of safe shutdown will be to place the facilities in a controlled state ready for dismantlement.

1.4.1 HS1AA - Project Oversight

The scope of Project Oversight consists of these activities needed to support the implementation of the Silos 1 and 2 Project and the documentation required, under the terms of the Site Closure Contract, to demonstrate the ability to execute the Silos 1 and 2 Project. The project documents represent the highest-level project documents generated and effectively describe the methods and reflect the FEMP Programs and Plans to use in order to complete the defined scope of work. The Project Oversight tasks consists of the following ~~two (2)~~ three (3) tasks:

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- 1) Project Management; and
- 2) Project Documentation; and
- 3) Division Project Management (begins fourth quarter of FY-06).

1.4.2 HS1AB - Design Data Development

The scope of Design Data Development consists of collection of project-specific data to understand the physical and chemical characteristics of the proposed treatment formulation for chemical stabilization and to support the development of the design of the Silos 1 and 2 treatment process, support facilities, and waste container design. The Design Data Development task will be accomplished through a joint effort between Duratek and the Silos 1 and 2 Site Engineering Team. The Design Data Development task consists of the following tasks:

- 1) Design Data Development Work Plan;
- 2) Laboratory Work Package;
- 3) Collect and Ship Silo Material;
- 4) Design Data Development Programs; and
- 5) Final Report.

1.4.3 Various - ~~Engineering and~~ Design

The scope of Engineering and Design consists of development of engineering, safety, and regulatory documentation that are necessary to support design of the Silos 1 and 2 treatment process, support facilities, and waste containers design from conceptual through final design phases. ~~The engineering and design activities will be managed by Duratek. Jacobs Engineering will be responsible for the detailed engineering and design for the Silos 1 and 2 Project. Fluor Fernald Site Engineers will be responsible for developing specified supporting documentation. The Design task consists of the following subtasks:~~

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- ~~1) Title I and II Design;~~
- ~~2) Title III Services;~~
- ~~3) Container Design and Testing;~~

- 4) Safety Basis; and
- 5) Regulatory Packages.

Engineering and Design also includes the engineering support required during the Construction, Startup, operations, and D&D phases of this project. The overall engineering and design activities will be managed by Fluor Fernald. Jacobs Engineering will be responsible for the detailed engineering and design. Fluor Fernald site engineers will be responsible for developing specified supporting documentation. The Engineering and Design scope consists of the following tasks, with the associated charge numbers shown in parenthesis:

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- 1) Conceptual Design (HS1AC - Fluor Fernald, HS1AE - Jacobs Engineering);
- 2) Preliminary Design (HS1AV - Fluor Fernald, HS1AW - Jacobs Engineering);
- 3) Final Design (HS1AX - Fluor Fernald, HS1AY - Jacobs Engineering);
- 4) Engineering Support of Construction, Startup, Operations, and D&D (HS1A1 - Fluor Fernald, HS1A2 - Jacobs Engineering);
- 5) Container Design and Testing (Various);
- 6) Safety Basis (Various); and
- 7) Regulatory Packages (Various);

1.4.4 HS1AD - Construction Management

The scope of Construction consists of these activities necessary to support construction including reviews, infrastructure coordination, planning and bidding support, subcontract oversight, and acceptance testing. Fluor Fernald will act as the General Contractor for construction of all the Silos 1 and 2 remediation and support facilities. The design and specifications of the construction scope will be divided into logical bid packages by discipline (i.e., Civil, Mechanical, and Electrical). Fixed-Price Contracts will be secured through an IFB process for each package. The Construction task consists of the following subtasks:

- 1) Construction Design Support;
- 2) Construction IFB Support; and
- 3) Construction Contract Management.

1.4.5 HS1AF - Subcontracts Miscellaneous

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The scope of this task consists of long lead procurement, advanced construction packages and miscellaneous subcontracted services to support miscellaneous work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.

1.4.6 HS1AG - Electrical Subcontract

The scope of this task consists of electrical work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.

1.4.7 HS1AH - Mechanical Subcontract

The scope of this task consists of mechanical work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.

1.4.8 HS1AJ - Civil Subcontract

The scope of this task consists of civil work performed by a subcontractor in support of construction activities for the Silos 1 and 2 Project.

1.4.9 HS1AK - Startup and Readiness

The scope of Startup and Readiness consists of those activities necessary to demonstrate that the project has been properly constructed and ready for operations and that the workforce has been properly trained and is ready to safely operate the facility. The startup and readiness activities include project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design basis. Additionally, the scope includes an evaluation of operational readiness by Fluor Fernald and a subsequent readiness evaluation by DOE-FEMP. The Startup and Readiness task consists of the following tasks:

- 1) Startup Management;
- 2) Operations and Maintenance Procedures Development;
- 3) Training;
- 4) SOT; and
- 5) ORR.

1.4.10 HS1AL - Operations and Maintenance

The scope of Operations and Maintenance consists of those activities necessary to support the proper operation of the TTA, the Radon Control System, the Silos 1 and 2 treatment process, and all support facilities. The scope will include retrieval of material from the TTA tanks, treatment of material to meet the NTS WAC, and treatment of radionuclides, particulate, and radon in the RCS. The Operations and Maintenance task consists of the following tasks:

- 1) Waste Transfer and Treatment; and
- 2) RCS and TTA Operations.

1.4.11 HS1AM - Waste Management

The scope of Waste Management consists of those activities necessary to support proper packaging, transportation, and disposal of treated Silos 1 and 2 material. In addition, the scope consists of those activities necessary for the proper management of secondary waste generated during operations. This task will include procurement of containers for treated Silos 1 and 2 material under a fixed-unit price contract, certification of treated Silos 1 and 2 waste against the NTS WAC, and transportation and disposal of waste at the NTS. The Waste Management task will consist of the following tasks:

- 1) Container Acquisition;
- 2) Container Management;
- 3) Waste Certification;
- 4) Container Transportation; and
- 5) Disposal.

1.4.12 HS1AN - Facility Shutdown

The scope of Facility Shutdown consists of those activities necessary to support safe shutdown of the TTA, RCS, Silos 1 and 2 treatment process, and support facilities. The scope of Facility Shutdown includes: isolation of utilities; establishment of temporary utilities; removal and treatment of hold-up material; and gross decontamination. Fluor Fernald will perform safe shutdown activities using FAT&LC personnel in accordance with the Collective Bargaining Agreement. The Facility Shutdown task consists of the following tasks:

- 1) Facility Shutdown Work Plan; and
- 2) Facility Shutdown.

1.4.13 HS1AP - D&D Support

The scope of D&D Support consists of those activities necessary to support D&D of the TTA, RCS, Silos 1 and 2 treatment process, and support facilities. Included in the scope are those activities necessary to support selection of a subcontractor to perform D&D and the necessary activities to manage the D&D contract. The Silos 1 and 2 Site Engineering Team will develop a performance specification to procure the services of a qualified contractor to perform D&D of the OU4 structures and remediation facilities. The D&D Support task consists of the following tasks:

- 1) D&D Implementation Plan;
- 2) Develop D&D RFP;
- 3) Bid and Award D&D Contract; and

4) D&D Contract Management and Support.

1.4.14 HS1AR - D&D Contract

The scope of this activity involves only the work performed by a qualified contractor under the terms and conditions of a Fixed-Price Contract. The contractor will be responsible for D&D of the OU4 structures and remediation facilities. ~~These facilities include the Silos Maintenance Shop, the RTS, the RCS, the TTA, the Silos support trailers, Silos 1, 2, 3, and 4, and the Silo 3 remediation facility.~~ These facilities include the Maintenance Shop (former Vitrification Pilot Plant), the RTS, the RCS, the TTA, the Silos support trailers, Silos 1, 2, 3, and 4, the Silo 3 remediation facility, and the Silos 1 and 2 remediation and support facilities.

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1.5 PROJECT PLAN/TECHNICAL SCOPE AND QUANTIFICATION

1.5.1 HS1AA - Project Oversight

The scope of the Project Oversight charge number HS1AA for the Silos 1 and 2 Project is defined by two project tasks: Project Management and Project Documentation.

1) Task #1 - Project Management

1.1) Plan/Scope - Project Management

The scope of the Project Management task consists of those project related activities which are needed to support the implementation of the Silos 1 and 2 Project. These tasks include, maintenance of this closure plan, quarterly updates to the baseline risk management plan (2500-RP-0038), workforce planning, daily filing and maintenance of project documentation and records, annual training updates for matrixed project personnel, contract administration, engineering and design oversight and support, regulatory submittal support, procurement support, stakeholder support, project-specific clerical support, quality assurance and operational readiness self-assessments, audits, surveillances, inspections, and client interface.

The duration of the Project Management activities are dependent upon the duration of the entire Silos 1 and 2 Project. Currently, this hammock activity is logically tied to begin with the start of the preparation of the Design Basis Package (Activity 101615) and ends with the completion of Project Closeout (Activity 101400). Progress will be apportioned based upon the completion of project milestones throughout each of the fiscal years.

1.2) Quantification - Project Management

The following **Table 1.5-1** summarizes the resources planned for the Project Management activities.

**TABLE 1.5-1
 FISCAL YEAR PROJECT MANAGEMENT RESOURCES (FTES) SUMMARY**

RESOURCE CODE	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08
SECRET	0.75	1.00	1.00	1.00	1.00	1.00	1.00	0.75
DEPADM	0.25	1.00	1.00	1.00	1.00	1.00	1.00	0.75
TECWRT			1.00	1.50	1.00	0.60	0.10	
GNSMGR	0.08	0.30	0.65	1.00	1.00	1.00	1.00	0.75
PRJMGR	0.50	0.88	1.00	1.00	1.00	1.00	1.00	0.75
PJCEST	0.25		0.80	1.00	0.16			
TPSREP	0.75	1.00	1.00	1.00	1.00	1.00	1.00	0.75
PRJMGR	0.08	0.20	0.20	0.43	1.00	1.00	1.00	0.75
PRJMGR	0.75	1.00	1.00	1.00	1.00	1.00	1.00	0.75
PURMGR	0.08	0.15	0.35	0.50	0.50	0.35	0.20	0.16
BUYCON	0.15	0.68	1.25	1.25	1.00	1.00	1.00	0.75
MPCREP						0.50	2.00	1.00
TPSREP	0.08	0.20	0.20	0.20	0.50	0.50	0.50	0.38
TPSMGR	0.08	0.35	1.00	1.00	1.00	1.00	1.00	0.75
TPSREP		1.25	1.38	0.50	0.50	0.30	0.30	0.23
INDHYG		0.30	0.30	0.35	0.88	1.00	1.00	0.63
FPRENG		0.10	0.10	0.10	0.10	0.10	0.10	0.08
TRNREP	0.10	0.20	0.50	0.85	1.00	0.75	0.35	0.08
QACENG	0.05	0.20	0.20	0.20	0.50	1.00	0.88	0.30
QACMGR	0.05	0.35	0.50	0.50	1.00	1.00	1.00	0.38
TOTAL	3.98	9.15	13.43	14.38	15.14	15.10	15.43	9.96
	4.0	9.16						

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TABLE 1.5-1

FISCAL YEAR PROJECT MANAGEMENT RESOURCES (FTES) SUMMARY

Resource Code	FY-01			FY-02			FY-03			FY-04			FY-05			FY-06			FY-07			FY-08			
	011	021	031	041	011	021	031	041	011	021	031	041	011	021	031	041	011	021	031	041	011	021	031	041	
BUYCON	0.2	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CLERKS	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
CNSMGR	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
CSTAN	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
DEPADM	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
ENGINR	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
FFPRENG	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
INDHYG	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
MNTMGR	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

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 September 2001

Resource Code	FY-01			FY-02			FY-03			FY-04			FY-05			FY-06			FY-07			FY-08			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
MPCREP																									
PJCSCH																									
PJUREP																									
PRGMGR																									
PRJMGR																									
PRJMGR																									
PRJMGR																									
PURMGR																									
OACMGR																									
RADENG																									
SAHMGR																									
SECRET																									
SECRET																									
TECWRT																									

2) Task #2 - Project Documentation

Various project documents will be prepared to demonstrate the ability to execute the Silos 1 and 2 Remediation Project, as required by the terms of the Site Closure Contract under this Closure Plan. The project documents will represent the highest-level project documents generated, and effectively describe the methods and reflect the FEMP Programs and Plans that will be used in order to complete the defined scope of work. The execution of activities will be consistent with the methods described in these documents.

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The scope, schedule, and resources of Project Documentation will be managed by the following five (5) key documents and/or activities:

- 1) Silos Project Execution Plan (PEP);
- 2) Training and Qualification Program(T&QP);
- 3) Quality Assurance Job Specific Plan (QAJSP);
- 4) Work Force Planning; and
- 5) Project Closure.

The schedule for all the Project Documentation activities is summarized under the Activity Hammock No. 100110. The resources will be managed and reported under charge number HS1AA. The following sections describe the scope, schedule, and planned resources for these key activities.

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2.1) Subtask #1 – Silos Project Execution Plan

2.1)1 Plan/Scope – Silos Project Execution Plan

~~The Silos Project Management (Division Level) will prepare a single PEP for the entire Silos Project in FY-01. The scope and resources are planned in HPM1A.~~

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~~Following approval of the Silos 1 and 2 baseline, assumed to be October 1, 2001, the Silos 1 and 2 PEP will be revised by the Silos Division 1 and 2 Project Manager and project team. The revised Silos PEP will reflect include the new path forward for the Silos 1 and 2 Project and satisfy the requirements of FEMP Procedure No. MS-1021, Rev. 3. The Silos PEP will reflect the review and incorporation of pertinent FEMP requirements and implementation documents into project planning and will state the mission, organizational roles and responsibilities, scope, project execution approaches, and deliverables throughout the life of the project. The Silos PEP will identify the ties between the execution of the remediation project and the FEMP requirements.~~

The SiLOS PEP will be maintained throughout the duration of the Silos Project. The SiLOS PEP will be reviewed annually and revised as needed, during the third quarter of following each fiscal year. The maintenance of the PEP will be the responsibility of the Silos Project Management HPM1A account for fiscal years FY-02 through FY-06.

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~~The preparation of the revised Silos 1 and 2 PEP will be initiated following completion of the FEMP's baseline process. The scope of the Silos 1 and 2 PEP will be tracked by the following activities in Table 1.5-2.~~

**TABLE 1.5-2
 FY02 SILOS PEP SUMMARY**

ACTIVITY NUMBER	DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
112021	SILOS PEP (FY02) (HAMMOCK)	105	--
112055	PREPARE SILOS PEP (START)	0	20%
112055	PREPARE SILOS PEP (COMPLETE)	60	60%
112065	REVIEW SILOS PEP	20	75%
112057	FINALIZE SILOS PEP	20	95%
112058	APPROVE SILOS PEP	5	100%

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~~Progress on key activities will be tracked and reported based upon the designated 20%, 60%, 75%, 95%, and 100% milestones identified with the completion of the respective activity.~~

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Beginning with FY03~~7~~ through FY08, annual revisions to the SiLOS PEP will be initiated during the third quarter of each fiscal year by the Silos 1 and 2 Project. Necessary revisions will be identified through a self-assessment performed by selected project team members. All annual revisions to the SiLOS PEP would be incorporated and approved by the following schedule summarized in Table 1.5-3.

**TABLE 1.5-3
 SILOS PEP ANNUAL REVISION SCHEDULE SUMMARY FOR FY-07 AND FY-08**

ACTIVITY NUMBER	DESCRIPTION	DURATION (Workdays)	MILESTONE
HAMMOCK	FY0X ANNUAL <u>SILOS</u> PEP REVISION SCHEDULE (Hammock)	60	--
#1	PREPARE <u>SILOS</u> PEP SELF ASSESSMENT	10	15%
#2	IDENTIFY <u>SILOS</u> PEP REVISIONS	10	35%
#3	REVISE <u>SILOS</u> PEP	20	65%
#4	REVIEW REVISED <u>SILOS</u> PEP	10	85%
#5	FINALIZE AND APPROVE <u>SILOS</u> PEP	10	100%
130200	FY03 ANNUAL <u>SILOS</u> PEP REVISION (Hammock)	60	--
130300	FY04 ANNUAL <u>SILOS</u> PEP REVISION (Hammock)	60	--
130400	FY05 ANNUAL <u>SILOS</u> PEP REVISION (Hammock)	60	--
130500	FY06 ANNUAL <u>SILOS</u> PEP REVISION (Hammock)	60	--

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130600	FY07 ANNUAL SILOS PEP REVISION (Hammock)	60	--
130700	FY08 ANNUAL SILOS PEP REVISION (Hammock)	60	--

2.1)2 Quantification – Silos Project Execution Plan

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Fluor Fernald, Silos 1 and 2 Site Engineering team members will support the Silos 1 and 2 Project Manager in the preparation of the Silos PEP and all annual revisions in FY-07 and FY-08. The following ~~Tables 1.5-4 and 1.5-5~~ summarizes the resources required to prepare and revise the Silos 1 and 2 PEP.

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TABLE 1.5-4
FY02 SILOS PEP PREPARATION RESOURCE SUMMARY

RESOURCE CODE	FY02 ACTIVITY NO. 112021 TOTAL RESOURCES (FTEs)
SECRET	0.05
DEPADM	0.1
CNSMGR	0.05
PRJMGR	0.3
TPSREP	0.25
PURMGR	0.05
BUYCON	0.05
TPSMGR	0.05
TRNREP	0.05
QACENG	0.05
QACMGR	0.05
TOTAL	1.05

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TABLE 1.5-5
SILOS PEP ANNUAL REVISION RESOURCE SUMMARY

RESOURCE CODE	FY037 -FY08 HAMMOCKS TOTAL RESOURCES (FTE)
SECRET	0.05
DEPADM	0.10
CNSMGR	0.05
PRJMGR	0.15
TPSREP	0.05
PURMGR	0.05
BUYCON	0.05
TPSREP	0.05
TPSMGR	0.05
TRNREP	0.05
QACENG	0.05
QACMGR	0.05
TOTAL	0.75

2.2) Subtask #2 - Training and Qualification Program

2.2)1 Plan/Scope - Training and Qualification Program

The Silos Project Management (Division Level) will prepare and maintain a T&QP for the Silos 1 and 2 Project. The scope and resources are planned in HPM1A.

The existing Silos 1 and 2 Project Training and Qualification Program, Rev. 3, will be revised to reflect the new path forward for Silos 1 and 2 Project and pertinent FEMP requirements.

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The T&QP identifies specific training and qualification requirements for Silos 1 and 2 Project personnel and other administrative and support personnel within the Silos Division of the FEMP as documented in the Silos 1 and 2 PEP.

The training and qualification requirements of project personnel described in the T&QP is intended to satisfy the requirements of Chapter I and IV of DOE Order 5480.20A.

~~The preparation of the Silos 1 and 2 T&QP will be initiated following completion of the Silos 1 and 2 PEP. The scope of the Silos 1 and 2 T&QP will be tracked by the following activities in Table 1.5-6.~~

**TABLE 1.5-6
 FY02 T&QP SCHEDULE SUMMARY**

ACTIVITY NUMBER	DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
112016	T&QP (HAMMOCK)	70	--
110104	PREPARE DRAFT T&QP	25	35%
110108	REVIEW DRAFT T&QP	20	65%
110112	FINALIZE T&QP	20	95%
110116	APPROVAL/ACCEPTANCE T&QP	5	100%

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~~Progress on key activities will be tracked and reported based upon the designated 35%, 65%, 95%, and 100% milestones identified with the completion of the respective activity.~~

Beginning with FY03~~7~~ through FY08, annual revisions to the T&QP will be initiated during the third quarter of each fiscal year by the Silos 1 and 2 Project. Necessary revisions will be identified through a self-assessment performed by several project team members. All revisions to the T&QP would be incorporated and approved by the following schedule summarized in **Table 1.5-7**.

**TABLE 1.5-7
 ANNUAL T&QP REVISION SCHEDULE SUMMARY FOR ~~FY-07 AND FY-08~~**

ACTIVITY NUMBER	DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HAMMOCK	FY0X ANNUAL T&QP REVISION (HAMMOCK)	60	--
#1	PERFORM SELF ASSESSMENT	10	15%
#2	IDENTIFY T&QP	10	35%
#3	REVISE T&QP	20	65%
#4	REVIEW REVISED T&QP	10	85%
#5	FINALIZE & APPROVE T&QP	10	100%
140300	FY03 ANNUAL T&QP REVISION (HAMMOCK)	60	--
140400	FY04 ANNUAL T&QP REVISION (HAMMOCK)	60	--
140500	FY05 ANNUAL T&QP REVISION (HAMMOCK)	60	--
140600	FY06 ANNUAL T&QP REVISION (HAMMOCK)	60	--
140700	FY07 ANNUAL T&QP REVISION (HAMMOCK)	60	--
140800	FY08 ANNUAL T&QP REVISION (HAMMOCK)	60	--

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2.2)2 Quantification - Training and Qualification Program

Fluor Fernald and Silos 1 and 2 Site Engineering Team members will support the Silos 1 and 2 Project Manager in the preparation of the T&QP and all annual revisions in ~~FY-07 and FY-08~~. The following ~~Tables 1.5-8 and 1.5-9~~ summarizes the resources required to prepare and revise the T&QP.

**TABLE 1.5-8
 FY02 T&QP PREPARATION RESOURCE SUMMARY**

RESOURCE CODE	FY02 HAMMOCK TOTAL RESOURCES (FTES)
SECRET	0.05
DEPADM	0.10
TPSREP	0.05
PRJMGR	0.05
TRNREP	0.05
QACENG	0.05
QACMGR	0.05
TOTAL	0.40

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**TABLE 1.5-9
 T&QP ANNUAL REVISION RESOURCE SUMMARY**

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RESOURCE CODE	FY037-FY08 HAMMOCKS TOTAL RESOURCES (FTES)
SECRET	0.05
DEPADM	0.10
PRJMGR	0.05
TRNREP	0.05
QACMGR	0.05
TOTAL	0.30

2.3) Subtask #3 - Quality Assurance Job Specific Plan

2.311 Plan/Scope - Quality Assurance Job Specific Plan

The Silos Project Management (Division Level) will prepare and maintain the QAJSP for the Silos 1 and 2 Project. The scope and resources are planned in HPM1A.

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A QAJSP will be prepared for the Silos 1 and 2 Project. The QAJSP process outlined in the FEMP Procedure QA-0009, Rev. 3, is designed to implement the requirements of the FEMP Quality Assurance Program (RM-0012) into project/program planning. The QAJSP will direct activities, to ensure appropriate requirements, are provided in project documents.

~~The preparation of the Silos 1 and 2 QAJSP will be initiated following completion of the Silos 1 and 2 PEP. The scope of the Silos 1 and 2 QAJSP will be tracked by the following activities in Table 1.5-10.~~

**TABLE 1.5-10
 FY02 QAJSP SCHEDULE SUMMARY**

ACTIVITY NUMBER	DESCRIPTION	DURATION (Workdays)	MILESTONE
112008	QAJSP HAMMOCK	70	—
100120	PREPARE DRAFT QAJSP	25	35%
100124	REVIEW DRAFT QAJSP	20	65%
100128	FINALIZE QAJSP	2	95%
100132	APPROVAL/ACCEPT QAJSP	5	100%

~~Progress on key activities will be tracked and reported based on the designated 35%, 65%, 95%, and 100% milestones identified with the completion of the respective activity.~~

Beginning with FY03~~7~~ through project completion in FY08, annual revisions to the QAJSP will be performed in parallel to the ~~Silos~~ PEP revisions ~~by the Silos 1 and 2 Project~~. Necessary revisions will be identified through a joint self-assessment performed by selected project team members.

2.3)2 Quantification - Quality Assurance Job Specific Plan

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~~Fluor Fernald Silos 1 and 2 Quality Assurance (QA) team members will support the Silos 1 and 2 Project Manager in the preparation of the QAJSP and all annual revisions. The following Table 1.5-11 summarizes the resources required to prepare and revise the QAJSP.~~

**TABLE 1.5-11
 QAJSP RESOURCE SUMMARY**

RESOURCE CODE	FY02 HAMMOCK TOTAL RESOURCES
QACENG	0.05
QACMGR	0.05
TOTAL	0.10

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Since the ~~Silos~~ PEP and QAJSP will be revised together on an annual basis, all Resources necessary to support annual revisions to the QAJSP are covered in the ~~Silos~~ PEP resource planning.

2.4) Subtask #4 - Workforce Planning

2.4)1 Plan/Scope - Workforce Planning

In order to ensure that a sufficient workforce is identified, properly trained and ready to operate the Silos 1 and 2 remediation facilities, the Silos 1 and 2 Project team must perform proper work force planning. As the Final Design Package nears completion, the Silos 1 and 2 Site Engineering will be responsible for developing a detailed Operations Schedule which also takes into consideration the treated Silos 1 and 2 material shipping schedule. The Operations and Maintenance Manager will provide manpower crew staffing and support requirements to support the Operations Schedule. The staffing requirements will be based upon the unit operations in the final design, job task analyses, and labor descriptions. A Labor Utilization Plan will be developed.

The Silos 1 and 2 Project team will meet with the FEMP Industrial Relations and FAT&LC representatives and reach a mutual agreement on the labor staffing for the project. The job positions will be posted, and the positions will be filled in accordance with FEMP Labor Agreement.

The schedule for the workforce planning is summarized by the Activity Hammock No. 100020, entitled, "Workforce Planning," having a total duration of 250 days. **Table 1.5-12** summarizes the activities and the milestones for reporting performance.

**TABLE 1.5-12
 WORKFORCE PLANNING SCHEDULE SUMMARY**

ACTIVITY NUMBER	DESCRIPTION	DURATION (Workdays)	MILESTONE
100020	Workforce Planning (Hammock)	250	-
109910	Detailed Operations Schedule	66	25%
109520	Joint Fluor Fernald/FAT&LC Meetings	40	50%
109540	Workforce Utilization Plan	70	75%
109560	FAT&LC Workforce Selection	70	100%

2.4)2 Quantification - Workforce Planning

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The Silos 1 and 2 Project team resources to support the workforce planning process are included in the Project Management labor resources, (~~Section 1.5.1.1~~ **Section 1.5.1, Task 1, Subtask 2**).

2.5) Subtask #5 - Project Closure

2.5)1 Plan/Scope - Project Closure

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Although project documentation will be managed on a day-to-day basis throughout the life of the Silos 1 and 2 Project (~~Section 1.5.1.1~~), a significant effort must be planned in order to closeout the project in accordance with FEMP Procedures.

In accordance with FEMP Procedure No. ED-12-9004, the Project Management Team must ensure that all necessary actions have been completed to closeout the Silos 1 and 2 Project. The primary objective is to resolve all outstanding issues, document the disposition of all property, disposition all project records, issue a Project Closure Report. In addition, the project team will perform the CD-4 self-assessment subject to DOE approval (Section 1.2.3).

Project Closure Report

FEMP Procedure No. ED-12-9004 identifies the process for preparing the project closeout report and provides a recommended format for the report. Since the final stage of the Silos 1 and 2 Project is essentially a D&D Project, the format of the project closure report will follow the guidelines for a D&D project.

Archive Project Documentation

FEMP Procedure No. ED-12-9004, "Project Closeout", and FEMP Procedure No. ED-12-5001, "Project Document Control", identifies the process for ensuring that all project documentation is properly assembled, controlled, and archived. At project completion, the Silos 1 and 2 Project Management Team will review the content of the project files and assemble any documents not previously issued by ECDC. The project management team will review the documents for retention of the latest revisions, proper labeling, discard of obsolete or inconsequential documents, and ensure that all documents to ECDC, including photographs and videos. ECDC will record and transmit all the project documentation to the Records Center for archiving.

Project Closeout

The Silos 1 and 2 Project Management team must ensure that the following actions have been completed during "Project Closeout", Activity No. 101400:

- Obtain proper construction records from construction management/oversight and Acquisitions as appropriate and verify all contractual work is completed and closed. This includes verification that all Purchase Orders and Service Contracts for the project have been closed out and final payment has been made.
- Verify all regulatory commitments and contractual requirements are completed and approved. Verify all documents are complete and appropriately filed. This includes requirements under RM-0033, Management of Government Property and ED-12-8002, Property Turnover.
- Prepare Control Account termination forms for Control Account Managers (CAMs) signature. This includes completion of Control Account/Charge Number Change Form per PCS-008, Work Authorization.

EM-PDRI CD-4 Self Assessment

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~~In support of the application of DOE Order 413.3 to the Silos 1 and 2 Project, the project team will perform a self-assessment of the project's maturity using the process described in Section 1.2.3 of this Closure Plan. It is assumed that DOE review and approval of the EM-PDRI assessment report will only take 20 work days. The Project Closure Report will also be included in this information package to support the EM-PDRI assessment.~~

The schedule for performance of the project closure activities is summarized under the Activity Hammock No. 101450, Project Closure Documentation. The resources will be managed and reported under charge number HS1AA. Table 1.5-13 summarizes the activities and their durations (workdays) for the performance of the project closure activities and the milestones for reporting performance.

**TABLE 1.5-13
 PROJECT CLOSURE SCHEDULE SUMMARY**

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ACTIVITY NUMBER	DESCRIPTION	DURATION (Workdays)	MILESTONE
101450	Project Closure Documentation	150	--
101455	Develop Project Closure Report (Start)	0	20%
101455	Develop Project Closure Report (Complete)	60	50%
101470	Review Project Closure Report	20	67%
101475	Revise Project Closure Report	30	90%
101478	Approve Project Closure Report	10	100%
101480	Archive Project Documentation	30	50/100%
101400	Project Closeout	30	50/100%
113800	EM-PDRI CD-4 Project Closeout	50	50/100%

2.5)2 Quantification - Project Closure

Table 1.5-14 summarizes the labor resources (FTEs) required for the performance of the Project Closure Activities. Silos 1 and 2 Site Engineering personnel will be responsible for performing the site closure activities.

TABLE 1.5-14
PROJECT CLOSURE RESOURCE SUMMARY

RESOURCE CODE	ACTIVITY NO. 101450 TOTAL RESOURCES (FTES)
SECRET	0.15
DEPADM	0.30
TPSREP	0.30
PRJMGR	0.10
MPCREP	0.50
TOTAL	1.35

3) Task #3 – Division Project Management

Beginning the fourth quarter of FY06, the Silos Division Project Management scope will be transferred to the Silos 1 and 2 Project. At this point in the Silos Project schedule, the Silos 1 and 2 Project will be the only active Silos Project and therefore, does not warrant a separate project management team at the Division level.

This scope of work includes management of the Silos Project within the overall FEMP site mission and coordination with other FEMP projects. Division Project Management provides resources for managing the Silos 1 and 2 Project on a divisional level. The Division Project Management overall scope is comprised of the following tasks:

- Project Management
- Administration
- Environmental Compliance
- Project Controls
- Public Relations
- Readiness and Assessments

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3.1) Subtask #1 - Project Management

3.1.1) Plan/Scope - Project Management

Silos project management provides for a technically qualified team responsible for executing the remediation of the Silos program (Operable Unit 4), which consists only of the Silos 1 and 2 Project. The project management team provides oversight of the technical program, provides day-to-day division management and interfaces with the programmatic areas. In addition, this scope will include subcontracts to provide for a CAT (3 members) to perform as an independent advisory panel to the DOE-FEMP. The CAT reviews technical documents, interviews Fluor Fernald staff, interacts with regulators and the public and provides written reports. The CAT will be active on the Silos Project through substantial completion of the remediation (FY-07).

The following are additional scope elements provided for in this task:

- Public meetings lead for Silos, provide assistance in response to stakeholder inquires.
- Insure Silos Project activities comply with all applicable safety regulations, policies, and DOE Orders, regulatory agreements/regulations, etc.

- Provide oversight of cost and schedule in accordance with baseline and Silos Project requirements.
- Manage preparation, review and implementation of departmental procedures.
- Insure integration with and support of site-wide programs, such as Technology Programs, Legal Affairs, Project Controls, etc.

3.1)2 Quantification – Project Management

The resources necessary to support project management are summarized in Table 1.5-14a. The project management manpower requirements planned under Task #1, Section 1.2) are adequate to perform this task.

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Table 1.5-14a
 Critical Analysis Team - Subcontract

Description	FY-06 (4Q)	FY-07	FY-08
Labor @ \$150/hour	\$81K	\$81K	\$0K
Travel based on 2 trips @ \$2,500 and 1 trip @ \$3,000 for 3 CAT members	\$24K	\$24K	\$0K

3.2) Subtask #2 – Administration

3.2)1 Plan/Scope – Administration

This scope includes the management of the Silos Project administrative functions, specifically, administrative staff integration, Human Resources interface, space coordination, property management, records management, document control, procedure coordination, computer allocation, Occurrence Reporting and Processing (OPR) system, commitment and action item tracking, document reviews coordination, training, safety and recognition coordination. Silos administrative scope will also include the procurement of office supplies, office equipment and credit card purchases. In addition, performance assessments, electronic timesheets, overtime requests, signature authorization, management distribution, organization charts, and alternate work schedules shall be monitored and managed in the administrative work scope.

3.2)2 Quantification – Administration

The administration resources necessary to support division project management are summarized in Table 1.5-14b. Resources begin with the fourth quarter of FY-06.

Table 1.5-14b
 Administration - Manpower Requirements

Resource Code	FY-06 (4Q)	FY-07	FY-08
Clerk	1.0	1.0	1.0

3.3) Subtask #3 - Environmental Compliance

3.3)1. Plan/Scope - Environmental Compliance

This scope is to provide environmental compliance to integrate Silos activities with site-wide environmental programs. The primary functions under this work scope are to interpret environmental regulations/requirements and to develop compliance strategies.

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The Environmental Compliance lead will act as the point of contact for regulatory agencies within the Silos Project. Remedial Design and Remedial Action work plans will be coordinated, issued, and comments resolved under the specific project scope of work.

3.3)2. Quantification - Environmental Compliance

The environmental compliance resources necessary to support division project management are summarized in Table 1.5-14c. Resource begins with the fourth quarter of FY-06.

Table 1.5-14c
 ENVIRONMENTAL COMPLIANCE - MANPOWER REQUIREMENTS

Resource Code	FY-06 (4Q)	FY-07
Technical/Program Support Representative	0.4	0.4

3.4) Subtask #4 - Project Controls

3.4)1. Plan/Scope - Project Controls

The scope includes the general implementation of Site Project Control procedures. Coordinate the definition of project work scope and preparation of the Work Breakdown Structure. Insure all work authorization procedures are followed. Develop resource-loaded

baseline schedules and a Performance Measurement Baseline (PMB). Control the PMB through the change control process. Insure all work is coordinated with Project Managers (PM) and Control Account Managers (CAM) in establishing budgets, developing and maintaining detailed plans and schedules, accumulating cost information, measuring performance against the PMB, performing variance analysis, developing forecast information, and managing funds. Provide internal cost and schedule reports and trend analysis. Maintain accurate accrual and commitment lists. Provide status for the preparation of the monthly Project Manager's Progress Report, the quarterly Integrated Planning, Accountability and Budgeting systems (IPABS) Report, the Monthly Program Status Review, the Mid-Year Review, and the Year End Review. Provide input as requested for the Site Specific Plan, and any audits. Provide cost and schedule information as requested by DOE, Silos Project departments, and Project Integration.

3.4)2 Quantification – Project Controls

The project control resources necessary to support division project management are summarized in Table 1.5-14d. Resources begin with the fourth quarter of FY-06.

Table 1.5-14d
PROJECT CONTROLS - MANPOWER REQUIREMENTS

R1- F07- 056	Resource Code	FY-06 (4Q)	FY-07	FY-08
	Cost Analyst	1.0	1.0	1.0
Scheduler	1.0	1.0	1.0	

3.5 Subtask #5 - Public Relations

3.5)1: Plan/Scope – Public Relations

The Silos project public relations scope is to provide support to maintain public involvement throughout the remediation of the Silos area (Operable Unit 4). The scope includes interfacing with and supporting the public relations group to facilitate communication activities associated with stakeholders, community, township, Citizen's Task Force, Fernald Residents for Environmental Safety and Health meetings, public meetings and workshops both at Fernald and in Nevada. The goal is to efficiently communicate and align with critical stakeholders.

3.5)2 Quantification – Public Relations

This subtask will be performed by the Project Manager and the Environmental Compliance lead. The manpower requirements planned under Task #1, Section 1.2) are adequate to perform this task.

3.6) Subtask #6 - Readiness and Assessments

3.6)1 Plan/Scope - Readiness and Assessments

Provides for management and coordination of Silos project readiness, quality, assessments, and programmatic requirements resulting from both internal and external reviews.

The scope of work includes management and policy development for all facets of operational readiness, ensuring that the facility and personnel are prepared to operate safely and effectively. As the Silos Project includes Hazard Category 3 facilities, ORRs are anticipated; therefore, the Silos Division management will coordinate with the Operations Assessment Program staff to ensure successful development and implementation of a Readiness Plan of Action leading to the final readiness assessments (RA, SSR, ORR).

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This scope includes the general participation, interview, program support, and program evaluation for assessments performed by both internal and external sources. The following groups are typically involved in such assessments: Critical Analysis Team, Defense Nuclear Facility Safety Board, JCE Team, DOE-HQ, National Academy of Sciences, Inspector General, Association of Toxic Substance and Disease Registry, Stakeholder Committees, Corp. of Engineers, and the GAO. Support personnel from the projects will charge to their respective projects while participating in reviews and assessments.

In addition, this scope includes the development and management of the Silos Division programs for Quality Assurance. This will include coordinating and performing project self-assessments as well as supporting the efforts of the independent QA and QC functions.

3.6)2 Quantification - Readiness and Assessments

The manpower requirements planned under Task #1, Section 1.2) are adequate to perform this task.

3.7) Subtask #7 - Other Direct Costs

3.7)1 Plan/Scope - Other Direct Costs

The materials and other direct costs required to perform the scope of work for all Project Management tasks (#1-6) are summarized in Table 1.5-14e.

Table 1.5-14e

Materials and Other Direct Costs

R1- F07- 056	1.5.1.1.1 Item	1.5.1.1.2 Basis	1.5.1.1.3 Cost
	Office Supplies & Equipment	FY-00 Actuals	\$30,000 / Year / FY-06 through FY-08
	Memberships	5 / Year @ \$200 ea.	\$ 1,000 / Year / FY-06 through FY-08
	Meetings and Conferences	FY-00 Actuals	\$ 4,000 / Year / FY-06 through FY-08
	Travel	Six Trips / Year Various Locations	\$12,800 / Year / FY-06 through FY-08
	Registration Fees	FY-00 Actuals	\$ 2,500 / Year / FY-06 through FY-08

3.8) Subtask #8 - Site Environmental, Safety, and Health Radiological Control

3.8)1. Plan/Scope - Site Environmental, Safety, and Health Radiological Control

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In the third quarter of FY06, most or all of the programmatic activities of Environmental Compliance, Occupational Safety & Health, Safety Analysis, Integrated Safety Management, and Radiological Control will be consolidated into a single programmatic ES&H organization, and assigned to the Silos Project. The oversight and assessment functions of these disciplines may be assigned to Silos Project at that time, or may be retained in a separate oversight organization. The programmatic ES&H organization will continue to be responsible for sitewide programs in these disciplines, even though it will be located in a project organization, rather than a separate programmatic organization. The manpower required by this organization is being entered on the Environmental Compliance, Occupational Safety & Health, Integrated Safety Management, and Radiological Control manpower sheets, however, to ensure that the manpower requirement for this scope is captured in the baseline effort.

In keeping with the consolidation of programmatic functions of the Environmental Compliance, Occupational Safety & Health, Safety Analysis, Integrated Safety Management and Radiological Control functions, certain assumptions have been made. The functions to be consolidated have certain general functions in common such as:

- Program Documentation
- Record keeping/Reporting
- (RCRA, OSHA, Workman's Comp, Radiation Exposures, Chemical Exposures)
- Permitting
- Event Investigation
- PAAA Evaluation (Rad, SA)
- Compliance Training/Qualifications

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Independent assessment and oversight functions of these disciplines may also be included in this consolidation or may be consolidated elsewhere in an independent oversight organization.

3.8)2. Quantification - Site Environmental, Safety, and Health Radiological Control

In FY06 responsibility for most or all ES&H Rad Control scope will be transferred to the Silos Project, however in this Baseline the scope and budget for this function are included in PBS-12 through project completion.

1.5.2 HS1AB - Design Data Development

Laboratory tests will be conducted to collect process-specific data to understand the physical and chemical characteristics of the proposed treatment formulation for chemical stabilization and to support the development of the preliminary design for the Silos 1 and 2 treatment process, support facilities, and waste container design.

The scope, schedule and resources for the Design Data Development will be managed by the following five (5) key activities:

- Design Data Development Work Plan;
- Laboratory Work Package;
- Collect and Ship Silo Material;
- Design Data Development Programs; and
- Final Report.

The schedule for all the Design Data Development activities is summarized under the Activity Hammock No. 102200. The resources will be managed and reported under charge number HS1AB. The following sections describe the scope, schedule and planned resources for these key activities.

1) Task #1 - Design Data Development Work Plan

1.1) Plan/Scope - Design Data Development Work Plan

Duratek personnel will be responsible for the development of the Design Data Development Work Plan. The Silos 1 and 2 Site Engineering Team will prepare the Design Data Development Work Plan in a joint effort with the Duratek Technical Support Team. The work plan will define the test objectives and describe: the scope of the testing; laboratory and analysis methods; data collection; deliverables; project management; and the reporting process. The work plan will describe the details of accomplishing bench-scale and pilot scale testing (discussed in more detail in ~~Section 1.5.2.4~~ Section 1.5.2, Task 4).

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Table 1.5-15 summarizes the activities and their duration (workdays) for the development of the Design Data Development Work Plan. It is assumed that Design Data Development testing cannot begin until the work plan and laboratory work package documentation is approved.

**TABLE 1.5-15
 DESIGN DATA DEVELOPMENT WORK PLAN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102202	Design Data Development Work Plan (Hammock)	120	--
102203	Define Data Needs	30	25%
102204	Prepare Design Data Development Work Plan	40	50%
102208	Fluor Fernald Review and Comment Work Plan	20	70%
102212	Incorporate Review Comments – Work Plan	20	90%
102216	Fluor Fernald Acceptance Work Plan	10	100%

All activities are assumed to have a “finish to start” relationship. The project schedule and planned resources also assume that Fluor Fernald will provide a copy of the Work Plan to DOE for information only. Progress on the key activities will be tracked and reported based upon the designated 25%, 50%, 70%, 90%, and 100% milestones identified with the completion of the respective activity.

1.2) Quantification - Design Data Development Work Plan

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Table 1.5-16 summarizes the labor resources required for the preparation of Design Data Development Work Plan. ~~It is assumed that two full time employees (FTEs) of Fluor Fernald Site Engineering and two FTEs of Duratek personnel will be required to develop the work plan.~~ It is assumed Fluor Fernald Site Engineering and Duratek personnel will develop the work plan.

**TABLE 1.5-16
 DESIGN DATA DEVELOPMENT WORK PLAN RESOURCE SUMMARY**

RESOURCE CODE	ACTIVITY NO. 102202 TOTAL RESOURCES
LABOR (FTEs)	
ENGPRG	1.15
RADTEG	0.05
TPSREP	0.50
Total FTEs	1.70
Other Direct Costs (ODCs)	\$500

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TABLE 1.5-16

DESIGN DATA DEVELOPMENT WORK PLAN RESOURCE SUMMARY

RESOURCE CODE	ACTIVITY NO. 102202 - TOTAL RESOURCES					
	JAN	FEB	MAR	APR	MAY	JUNE
LABOR (FTEs)						
ENGPRC	0.5	0.5	0.25	0.2	0.2	0.2
TPSREP	0.5	0.25	0.25	0.25	0.25	0.25
TPSREP	0.3	0.3	0.3	0.3	0.3	0.3

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2) Task #2 - Laboratory Work Package

2.1) Plan/Scope - Laboratory Work Package

It is planned that a portion of the Silos 1 and 2 laboratory testing identified in the work plan will be performed at the FEMP site. This testing would be performed by Fluor Fernald personnel under the direction of the Duratek Design Data Development Manager.

Pursuant to FEMP Procedure MS-1027, Laboratory Building Work Planning and Management, a work plan and all pertinent supporting documentation (i.e., permits, procedures, etc.) shall be prepared, reviewed and approved by appropriate personnel, prior to initiating any laboratory activities at the FEMP. The documentation is a comprehensive package which identifies the scope of work, defines responsibilities of project personnel, identifies prerequisites to performing specific activities, identifies health and safety hazards and mitigators, defines procedures to be followed, disposition of all waste generated, drivers, checklists, appropriate permits and sign-offs.

Table 1.5-17 summarizes the subactivities and their (workdays) for the development of the laboratory work package documentation. It is assumed that preparation of the laboratory work package cannot begin until the draft work plan is approved.

**TABLE 1.5-17
 SCHEDULE SUMMARY FOR LABORATORY WORK PACKAGE**

ACTIVITY NUMBER	DESCRIPTION	DURATION (Workdays)	MILESTONE
102280	Prepare Laboratory Work Package (Hammock)	30	--
102281	Draft Laboratory Work Package	15	50%
102282	Review and comment	5	65%
102283	Incorporate comments and revise	5	85%
102284	Approve Laboratory Work Package	5	100%

All activities are assumed to have a "finish to start" relationship. The project schedule and planned resources also assume that Fluor Fernald will provide a copy of the Laboratory Work Package to DOE for information only. Progress on key activities will be tracked and reported based upon the designated 50%, 65%, 85%, and 100% milestones identified with the completion of the respective activity.

2.2) Quantification - Laboratory Work Package

The labor resources (FTEs) required for the preparation of the Laboratory Work Package are planned in the Project Management (Charge No. HS1AA) labor hours.

3) Task #3 - Collect and Ship Silo Material

3.1) Plan/Scope - Collect and Ship Silo Material

Silos 1 and 2 Site Project Engineering will be responsible for coordinating all FEMP support organization activities associated with locating the archived Silos 1 and 2 material, preparing the samples for shipment, and transportation of the samples to the Duratek laboratories. Duratek laboratory representatives will be required to support Fluor Fernald in the preparation of the shipping documentation for the Silo material.

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~~The schedule for collecting and shipping the Silo material is summarized in Table 1.5-18. The schedule for collecting and shipping the surrogate chemicals and silo material is summarized in Table 1.5-18.~~

Table 1.5-18

COLLECT AND SHIP SILO MATERIAL SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102235	Collect and Ship Silo Material (Hammock)	110	-

102240	Locate and Package Silos 1 and 2 Archive Material	60	50/100%
102218	Provide Material for Design Data Development Program	30	0/100%

The progress for this effort will be tracked and reported based upon the use of 50/100% and 0/100% milestones as noted in **Table 1.5-18**.

3.2) Quantification - Collect and Ship Silo Material

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~~It is estimated that five hundred man-hours would be required to locate the archived Silos material, prepare the samples for laboratory testing, and prepare the documentation for shipment. FEMP laboratory personnel and Silos 1 and 2 Project team members would be required to locate the archived Silos 1 and 2 material.~~ In addition, approximately 500 lbs. of surrogate material will be required to perform physical testing for the process design. It is planned that 500 lbs. of various chemicals, laboratory equipment and supplies will be procured to complete the data development program. Other direct costs associated with this work includes PPE, packaging, and transportation carrier services. These resources are summarized in **Table 1.5-19**.

TABLE 1.5-19
COLLECT AND SHIP SILO MATERIAL RESOURCE SUMMARY

R1- F07- 026	RESOURCE CODE	ACTIVITY NO. 102235 TOTAL RESOURCES
		LABOR (FTEs)
	ENGPRG	0.16
	LABTEC	0.52
	Subtotal FTEs	0.68
R1- F07- 014	ODCs	
	Transport Carrier	\$5,000
	Consumables	\$2,500
	Surrogate Chemicals	\$30,000
	Sales Tax (6%)	\$2,250
	Equipment Purchase	\$20,000
	Subtotal ODCs	\$62,500 \$39,750

TABLE 1.5-19

COLLECT AND SHIP SILO MATERIAL RESOURCE SUMMARY

R1- F07- 026	RESOURCE CODE	ACTIVITY NO. 102235 - TOTAL RESOURCES						
		FEB	MAR	APR	MAY	JUN	JUL	AUG
	LABOR (FTEs)							
	ENGPRG		0.25			0.2		
	S&HTEC						0.1	0.1
	TPSREP	0.25	0.25	0.25	0.25	0.5		
	TPSREP					0.3	0.3	0.3
	LABTEC						2.6	2.6
	LABMGR						0.1	0.1
	RADTEC			0.1	0.1	0.1		
	ODCs							

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	FEB	MAR	APR	MAY	JUN	JUL	AUG
Transport Carrier							\$5,000
Consumables							\$2,500
Surrogate Chemicals							\$30,000
Sales Tax (6 %)							\$2,250
Equipment Purchase							\$20,000
Subtotal ODCs							\$62,500 \$39,750

4) Task #4 Design Data Development Programs

4.1) Plan/Scope Design Data Development Programs

The Design Data Development Program will be conducted in two (2) phases. The first phase of testing will be conducted on a laboratory scale using archived Silos 1 and 2 material and surrogate materials with the following objectives:

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- Optimize waste loading (wt %) of the Silos 1 and 2 material using a phosphate-based formulation with selective additives;
- Verify optimal treatment formulation meets the NTS WAC;
- Identify treated waste product's physical (i.e., mixing and curing characteristics), chemical and radiological characteristics; and
- Identify process control parameters and establish operating envelope (identification of additives and additive ratios, process set points and limits).

A second phase of testing will be conducted on a pilot scale basis using a non-radioactive physical surrogate of the Silos 1 and 2 material with the following objectives:

- Understand the material handling properties of the Silos 1 and 2 material (i.e., slurry, settling);
- Evaluate the performance of key process equipment (i.e., filtration system, ribbon

- mixer, etc.);
- Establish the design basis for equipment sizing, support systems, facility layout, etc.; and
- Understand the effects of waste loading variations on the process.

Both phases of the Design Data Development Program will be conducted in parallel. The pilot scale testing will be conducted at the Clemson Environmental Technical Laboratory, and the analytical testing services will be provided by independent testing laboratory.

The schedule for performing the Design Data Development laboratory activities is summarized in Table 1.5-20.

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Table 1.5-20
DESIGN DATA DEVELOPMENT TESTING SCHEDULE SUMMARY
DESIGN DATA DEVELOPMENT PROGRAM SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102215	Design Data Development Program (Hammock)	80	-
102220	Start Design Data Development Program (Phase I and II)	20	0/100%
102244	Complete Design Data Development Program (Phase I and II)	60	50/100%

The progress for this effort will be tracked and reported based on the use of 0/100% and 50/100% milestones as noted in Table 1.5-20.

4.2) Quantification - Design Data Development Programs

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It is estimated that three hundred samples will be generated and analyzed during the Phase I and II Design Data Development Testing Programs. A summary of the samples and analytical costs for the samples is provided in Table 1.5-21.

Table 1.5-21
DESIGN DATA DEVELOPMENT TEST PARAMETERS

SAMPLES		ANALYTICAL TESTS		DISPOSAL	TOTAL COST (\$)
TYPE	QTY.	TCLP (Metals-Only)	PAINT FILTER		
Treated Silo Material (solid)	200	100	100	200	
Filtrate (liquid)	100	50	50	100	

Total Samples	150	150	300	
Cost/Test	\$500	\$100	\$100	
Total Costs	\$75,000	\$15,000	\$30,000	\$120,000

Table 1.5-22 summarizes the resources required for the performance of the Phase I and II Design Data Development Programs.

Table 1.5-22
PHASE I AND II DESIGN DATA DEVELOPMENT RESOURCE SUMMARY

RESOURCE CODE	ACTIVITY NO. 102215 TOTAL RESOURCES
Labor (FTEs)	
ENGPRC	1.25
S&HTEC	0.075
TPSREP	0.625
DURATEK Consultant (TPHO)	0.5
DURATEK Consultant (TPHO)	0.1
LABTEC	2.15
LABMGR	0.075
Subtotal FTEs	4.775
ODCs	
Equipment Purchase/Rental	\$40,000 \$25,000
Subcontract (task order) With UC	\$199,000
Consumables	\$20,000 \$10,000
Travel	\$56,000
Sales Tax (6%)	\$2,100
Subtotal ODCs	\$166,000 \$236,100

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~~5) Task # 5 Final Report~~

~~5.1) Plan/Scope Final Report~~

~~A Final Report will be prepared by Fluor Fernald Site Engineering personnel, peer reviewed by selected project personnel and finalized. The Final Report will present and summarize the data generated during both phases of the laboratory testing. The final report will contain the following information (as a minimum):~~

- ~~• Description of the characteristics of a desired grout;~~

- ~~Description of the surrogate(s) used and how it is to be validated;~~
- ~~Description and tabulation of all grout formulations tried;~~
- ~~Summary of results on methods used to obtain desired moisture content of Silos 1 and 2 materials with BentoGrout™ prior to treatment;~~
- ~~Summary of results (both bad and good) for each grout formulation used;~~
- ~~Summary of tests and results for desired formulation;~~
- ~~Summary of desired formulation operating envelope based on test results;~~
- ~~Summary of process control parameters, ranges, setpoints and limits for desired formulation;~~
- ~~Summary of results of grout formulations made with actual Silos 1 and 2 material;~~
- ~~Comparison of the results between the grouts made with surrogates and actual Silos 1 and 2 material, where differences in results shall be quantified and explained (as possible);~~
- ~~Evaluation of why the desired grout formulation(s) is optimal for (1) ease of processing, (2) robustness, (3) waste loading, and (4) container and shipping impacts;~~
- ~~Discussion of requirements for the process control system for the remediation facility can measure, respond, and control within the desired formulation's operating envelope.~~

The schedule for completing the final report is summarized by the following activities in ~~Table 1.5-23.~~

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**Table 1.5-23
 FINAL REPORT SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102223	Final Report (HAMMOCK)	60	--
102224	Prepare Report (START)	0	20%
102224	Prepare Report (COMPLETE)	30	50%
102228	Peer Review	10	65%
102232	Incorporate Review Comments Final Report	20	80%
102236	Fluor Fernald Acceptance of Final Report	10	100%

~~Progress on these activities will be tracked and reported using 20%, 50%, 65%, 80%, and 100% milestones as noted.~~

Completion of the laboratory testing and subsequent final report are key predecessor activities to completing the Final Container Design Package for the Silos 1 and 2 material and completing the Conceptual Design for the remediation facility.

4) Task #4 - Design Data Development Programs

4.1) Plan/Scope - Design Data Development Programs

The Design Data Development Program will be conducted at the University of Cincinnati. The testing will be conducted on a laboratory-scale basis using archived Silos 1 and 2 material and surrogate materials with the following objectives:

- Optimize waste loading (wt %) of the Silos 1 and 2 material using a phosphate-based formulation with selective additives;
- Verify optimal treatment formulation meets the NTS WAC;
- Identify treated waste product's physical (i.e., mixing and curing characteristics), chemical and radiological characteristics; and
- Identify process control parameters and establish operating envelope (identification of additives and additive ratios, process set points and limits);
- Understand the material handling properties of the Silos 1 and 2 material (i.e., slurry, settling);
- Evaluate the performance of key process equipment (i.e., filtration system, ribbon mixer, etc.);
- Establish the design basis for equipment sizing, support systems, facility layout, etc.; and
- Understand the effects of waste loading variations on the process.

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The schedule for performing the Design Data Development laboratory activities is summarized in Table 1.5-20:

**TABLE 1.5-20
 DESIGN DATA DEVELOPMENT PROGRAM SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102215	Design Data Development Program (Hammock)	80	
102220	Start Design Data Development Program	20	0/100%
102244	Complete Design Data Development Program	60	50/100%

The progress for this effort will be tracked and reported based on the use of 0/100% and 50/100% milestones as noted in Table 1.5-20.

4.2) Quantification - Design Data Development Programs

It is estimated that three hundred samples will be generated and analyzed during the Design Data Development Testing Programs. A summary of the samples and analytical costs for the samples is provided in Table 1.5-21.

TABLE 1.5-21
 DESIGN DATA DEVELOPMENT TEST PARAMETERS

SAMPLES		ANALYTICAL TESTS			TOTAL COST (\$)
TYPE	QTY.	TCLP (Metals Only)	PAINT FILTER	DISPOSAL	
Treated Silo Material (solid)	200	100	100	200	
Filtrate (liquid)	100	50	50	100	
Total Samples		150	150	300	
Cost/Test		\$500	\$100	\$100	
Total Costs		\$75,000	\$15,000	\$30,000	\$120,000

Table 1.5-22 summarizes the resources required for the performance of the Design Data Development Programs.

TABLE 1.5-22
 DESIGN DATA DEVELOPMENT RESOURCE SUMMARY

RESOURCE CODE	ACTIVITY NO. 102215	TOTAL RESOURCES
Labor (FTEs)		
ENGPRC		1.25
S&HTEG		0.075
TPSREP		0.625
DURATEK Consultant (TPHO)		0.5
DURATEK Consultant (TPHO)		0.1
LABTEG		2.15
LABMGR		0.075
Subtotal FTEs		4.775
ODCs		
Equipment Purchase/Rental		\$25,000
Consumables		\$10,000
Sales Tax (6%)		\$2,100
Subcontract (Task Order) with UC and Clomson		\$199,000
Subtotal ODCs		\$236,100

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TABLE 1.5-22

DESIGN DATA DEVELOPMENT RESOURCE SUMMARY

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RESOURCE CODES	ACTIVITY NO. 102215 - TOTAL RESOURCES				
	SEP	OCT	NOV	DEC	JAN
LABOR (FTEs)					
LABMGR	0.1				
LABTEC	2.6	1.7			
S&HTEC	0.1				
TPSREP	0.3	0.3	0.20	0.15	0.15
ODCs					
Equipment Purchase/Rental	\$25,000				
Consumables	\$10,000				
Sales Tax (6%)	\$2,100				
Subcontract (Task Order) with UC and Clemson	\$297,000				
Subtotal ODCs	\$334,100				

5) Task #5 - Final Report

5.1) Plan/Scope - Final Report

A Stabilization Test Report will be developed as a final report for activities performed during design data development. This report will include the results of the tests, treatments, and verifications done on the waste samples. Specifically, the report will include the following information:

- Description of apparatus and procedures used;
- The number of experimental runs and the conditions for each run;
- Tabulated test results;
- Demonstration that the minimum performance criteria were met;
- Description of the sampling and analysis procedures, including QA/QC procedures used to assure the validity of the results at the required level;
- Settling rate curves;
- Percent solids in the supernatant and settled phases;
- Optimum and alternative formulations for each sample;
- Description of additives;
- Mass and volume change per definitions given in the Laboratory Test Plan;
- Discussion of results;
- Summarization of the results;
- Evaluation and description of the operating envelope of the recipe(s); and
- Evaluation of process parameters that will be needed to control and maintain the process within the operating envelope of the recipe(s).

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In addition, the following observations and comments specific to this project may be presented and discussed as appropriate:

- Curing time;
- Volume increase;
- Type of mixing (i.e., batch or continuous);
- Heat generation;
- Contact time in the mixer (minimum and maximum);
- Handling characteristics and hazards associated with reagents; and
- Handling characteristics of the mixture before curing.

The schedule for completing the final report is summarized by the following activities in Table 1.5-23.

**TABLE 1.5-23
 FINAL REPORT SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102223	Final Report (HAMMOCK)	60	
102224	Prepare Report (START)	0	20%
102224	Prepare Report (COMPLETE)	30	50%
102228	Peer Review	10	65%
102232	Incorporate Review Comments Final Report	20	80%
102236	Fluor Fernald Acceptance of Final Report	10	100 %

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Progress on these activities will be tracked and reported using 20%, 50%, 65%, 80%, and 100% milestones as noted.

Completion of the laboratory testing and subsequent final report are key predecessor activities to completing the Final Container Design Package for the Silos 1 and 2 material and completing the Conceptual Design for the remediation facility.

5.2) Quantification - Final Report

Fluor Fernald Site Engineering project team representatives will prepare the Final Report with technical input from the chemical stabilization consultants. The draft Final Report will be peer reviewed prior to its finalization. The following Table 1.5-24 summarizes the resources necessary to prepare, review, and issue the report.

**TABLE 1.5-24
 FINAL REPORT RESOURCE SUMMARY**

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RESOURCE CODE	ACTIVITY NO 102223 TOTAL RESOURCES
Labor	
Duratek (TPHO)	0.1
Duratek (TPHO)	0.1
TPSREP	0.65
LABTEC	0.56
ENGPRC	1.3
Total FTEs	2.71
ODCs	\$500

TABLE 1.5-24

FINAL REPORT RESOURCE SUMMARY

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RESOURCE CODE	ACTIVITY NO. 102223 - TOTAL RESOURCES				
	OCT	NOV	DEC	JAN	FEB
LABOR (FTEs)					
TPSREP		0.10	0.15	0.35	0.5
ODCs	\$250			\$250	

1.5.3 HS1AC Design

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The engineering and design activities for the Silos 1 and 2 Project will be managed by Duratek. Jacobs Engineering will be responsible for the detailed engineering and design for the Silos 1 and 2 Project. Fluor Fernald Site Engineers will be responsible for developing specified supporting documentation. Appendix A provides a listing of all project deliverables, including a brief definition and organizational responsibility assignments for the preparation of each document.

~~The scope, schedule and resources for the Silos 1 and 2 Design will be managed by the following five (5) activities:~~

- ~~• Title I and II Design;~~
- ~~• Title III Services;~~
- ~~• Container Design and Testing;~~
- ~~• Safety Basis Documentation;~~
- ~~• Remedial Design/Remedial Action Deliverables.~~

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~~The schedule for all the design activities is summarized under one Activity Hammock No. 101600, entitled "Engineering, Design, and CFC." The resources will be managed and reported under charge number HS1AC. The following sections describe the scope, schedule, and planned resources for these key activities.~~

1) ~~Task #1 Title I and II Design~~

~~In support of the baseline procurement strategy, the Title I and II design approach will facilitate preparation of multiple IFB packages or RFP. Jacobs Engineering will prepare the deliverables identified in Attachment A including drawings, specifications, cost estimates, and specified technical documentation, which become key components of the IFB Package prepared by Fluor Fernald. The IFB packages will be logically divided into the following packages:~~

- ~~• Electrical;~~
- ~~• Mechanical;~~
- ~~• Civil; and~~
- ~~• Container (prepared by Duratek).~~

~~During Title I and II design, Jacobs Engineering and Fluor Fernald will identify the need to initiate long lead procurement activities for specific pieces of equipment or systems. Considerations for long lead procurement will include: those items whose vendor specific design could impact the project's safety basis or final design of the remediation and/or support facilities; any items whose early procurement can mitigate project schedule risk; and any expensive items, whose early procurement can help balance site fiscal funding.~~

~~The scope, schedule, and resources for the Title I and II design effort for the Silos 1 and 2 Project will be planned, managed, and reported under the following Hammock Activities:~~

- ~~1) Design Basis Package;~~
- ~~2) Conceptual Design Package;~~
- ~~3) Preliminary Design Package; and~~
- ~~4) Final Design Package.~~

~~These Hammock Activities summarize the logical development of the Silos 1 and 2 Title I and II Design effort. The transition between stages will be seamless, based upon close working relationships of the integrated design team.~~

~~1.1) Subtask #1 Design Basis Package~~

~~1.1)1 Plan/Scope Design Basis Package~~

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~~Fluor Fernald Silos 1 and 2 Site Engineering will prepare a "Design Basis Package" which will serve as the basis for the Conceptual Design Package, Preliminary Design Package, Final Design Package and Container Design activities performed by Jacobs Engineering and Duratek Services for the Silos 1 and 2 Project. The purpose of the Design Basis Package is to facilitate the development of the technical baseline for the engineering and design concept(s) and to establish the appropriate integration of safety, technical, and regulatory requirements into the design. The scope of the Design Basis Package includes the following key documentation package:~~

- ~~• List of Project Deliverables and Definitions;~~
- ~~• Design Basis and Assumptions;~~
- ~~• Functional and Technical Requirements;~~
- ~~• Conceptual Design Information; and~~
- ~~• Project Schedule/Budget.~~

~~The Design Basis Package will take advantage of previous technical efforts undertaken in support of the Silos 1 and 2 Project. The Design Basis Package includes pertinent functional requirements, administrative, technical, safety, and regulatory requirements, design criteria and related conceptual design information extracted from the following Silos 1 and 2 documents:~~

- ~~• Revised Silos 1 and 2 Feasibility Study, Appendix G;~~
- ~~• Draft Silos 1 and 2 RFP, Part 7, Technical Requirements document; and~~
- ~~• Draft Silos 1 and 2 RFP, Part 8, Safety Requirements document.~~

~~A peer review of this information will be performed to ensure the "Design Basis Package" provided to Jacobs Engineering reflects the current path forward for the remediation of the Silos 1 and 2 and includes only those essential requirements and criteria to ensure the remediation is performed in a safe contractual and regulatory compliant manner.~~

~~The Silos 1 and 2 Site Engineering Team will conduct a presentation of the completed Design Basis Package with Jacobs Engineering, to "kickoff" the conceptual design effort. The Design Basis Package will be issued as a unique record and be revised according to the Record Management Program.~~

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~~The Design Basis Package is represented by Activity Number 101615, "Design Basis Package", having 63 days of duration. Upon completion of the Design Basis Package, Fluor Fernald, Silos 1 and 2 Site Engineering will conduct a one-day "kick-off meeting" with Jacobs Engineering team members at their offices in Oak Ridge, Tennessee.~~

~~1.1)2 Quantification Design Basis Package~~

~~Table 1.5-25 summarizes the resources for the preparation of the "Design Basis Package."~~

**TABLE 1.5-25
 DESIGN BASIS PACKAGE RESOURCE SUMMARY**

RESOURCE CODE	TOTAL RESOURCES
Labor (FTEs)	
ENGPRG	1.2
TPSREP	1.0
PRJMGR	1.0
Subtotal FTEs	3.2
ODC's	
Travel (5) 3-Day Trips @ \$855/trip	\$4275

~~1.2) Subtask #2 Conceptual Design Package~~

~~1.2)1 Plan/Scope Conceptual Design Package~~

~~Following the completion of the "kick off meeting" between Jacobs Engineering and the Silos 1 and 2 Site Engineering team, Jacobs Engineering will develop the information and documentation that is needed to complete the conceptual design phase of the Silos 1 and 2 Project. Jacobs Engineering will assemble a Conceptual Design Package which establishes the projects technical baseline and meets the intent of the FEMP Procedures:~~

- ~~• ED 12 4001, Functional Requirements;~~
- ~~• ED 12 4002, Conceptual Design Report;~~
- ~~• ED 12 4003, Design Criteria Package; and~~
- ~~• ED 12 4004, Design Package.~~

~~Selected Silos 1 and 2 Site Engineering team members will assist Jacobs Engineering throughout the development and preparation of the Conceptual Design Package and participate in over the shoulder reviews to expedite the preparation of the required documentation. Silos 1 and 2 Safety Analysis team members will closely interface with Jacobs Engineering throughout the development of the Conceptual Design Package to ensure consistency, continuity, and completeness with the Safety Basis Documentation and the engineering and design documentation.~~

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~~The schedule for the Conceptual Design Package is summarized by the Activity Hammock No. 101666 entitled, "Conceptual Design Package," having a total of 80 days of duration. Jacobs Engineering will provide a more detailed resource loaded schedule, including activity milestones, within 60 days following the kickoff of the Title I and II design. Upon review and acceptance by the Silos 1 and 2 Site Engineering team, this schedule will be incorporated into the Silos 1 and 2 baseline closure planning documents.~~

1.2)2 Quantification Conceptual Design Package

~~The planned resources for the Silos 1 and 2 Conceptual Design Package are summarized in Table 1.5-26. Project management and oversight labor is planned under, Project Management (Charge No. HS1AA).~~

**TABLE 1.5-26
 CONCEPTUAL DESIGN PACKAGE RESOURCE SUMMARY**

RESOURCE CODE	CONCEPTUAL DESIGN PACKAGE ACTIVITY NO. 101666 TOTAL RESOURCES			
	APR 01	MAY 01	JUN 01	JUL 01
Labor (FTEs)				
JACOBS (TPHO)	32	32	32	39
DEPADM	-	-	-	1
ENGINR	-	-	-	0.5
PRJMGR	1	1	1	1
TPSREP	0.5	0.5	0.5	1
ENGPRC	0.5	0.5	0.5	-
TPSREP	1	1	1	1
ENGELE	-	-	-	0.5
ODCs				
TRAVEL TO OAK RIDGE	\$4275	\$4275	\$4275	\$4275

~~1.3) Subtask # 3 Preliminary Design Package~~

~~1.3)1 Plan/Scope Preliminary Design Package~~

~~The Preliminary Design Package will be prepared and verified by Jacobs Engineering consistent with the requirements of FEMP Procedure No. ED 12-4004, Design Package. The documentation, which comprises the Preliminary Design Package, including the expected level of detail of the components, is identified in Appendix A.~~

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~~The Preliminary Design Package will demonstrate the appropriate integration of requirements and criteria into the design, and once approved, will establish the technical baseline for configuration management. The scope of the Preliminary Design Package will include all systems identified in the Design Basis Package, as well as all support systems required by the Jacobs Engineering design concept.~~

~~Selected Silos 1 and 2 Site Engineering team members will assist Jacobs Engineering throughout the development and preparation of the Preliminary Design Package and will participate in "over the shoulder" reviews to expedite the preparation of the required documentation. Fluor Fernald Safety Analysis team members will closely interface with Jacobs Engineering throughout the development of the Preliminary Design Package to ensure consistency, continuity, and completeness with the Safety Basis Documentation (Section 1.5.3.4). The Silos 1 and 2 site Engineering team will involve all appropriate parties (i.e., construction, operations, etc.) in the review of the design package, so that the verification of the Preliminary Design Package will satisfy the requirements of FEMP Procedure Number, ED 12-4010, Design Verification. The entire Preliminary Design Package will be issued by the Silos 1 and 2 Project Team as a formal submittal for internal review. DOE-FEMP will be provided an informational copy to stay abreast of design status.~~

~~Individual components and documents supporting the Preliminary Design Package may be submitted, as they become available to expedite the final review process and to allow comments to be resolved and incorporated into follow-on revisions. Each document will be issued as a unique record through the FEMP ECDC and be revised accordingly from its previous submittal according to the Record Management Program (to include Configuration Management).~~

~~Specific components of the Preliminary Design Package will be extracted and combined with other project related documents and submitted to the EPA/OEPA under the Remedial Design Package for review and approval (see Section 1.5.3.5.2).~~

The Silos 1 and 2 Site Engineering Team will be responsible for obtaining geotechnical samples and analysis from eight (8) soil borings located within the boundaries of the Silos 1 and 2 remediation facilities footprint to support the Jacobs design effort. The soil borings will be provided through a new services contract and the geotechnical analysis of the soil borings and summary report will be obtained through the amendment of an existing FEMP subcontract with ATEC, Inc. Based upon past experience, the cost of the soil borings, geotechnical analysis and summary report is planned at \$50,000.

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The schedule for the Preliminary Design Package is summarized by the Activity Hammock No. 101670, entitled, "Preliminary Design Package," having a total of 200 days of duration. Jacobs Engineering will provide a more detailed resource loaded schedule, including activity milestones, within 60 days following the kick-off of the Title I and II design. Upon review and acceptance by the Silos 1 and 2 Site Engineering Team, this schedule will be incorporated into the Silos 1 and 2 baseline closure planning documents.

1.3)2 Quantification Preliminary Design Package

The planned resources for the Silos 1 and 2 Preliminary Design Package are summarized in the following Table 1.5-27.

**TABLE 1.5-27
 PRELIMINARY DESIGN PACKAGE RESOURCE SUMMARY**

RESOURCE CODE (FTEs)	2001					2002				
	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
LABOR (FTEs)										
JACOBS (TPHO)	39	39	44	44	44	44	44	44	44	22
DURATEK (TPHO)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DURATEK (TPHO)	0.05	0.05	0.05	-	-	-	-	-	-	-
CLERKS	-	-	1	1	1	1	1	1	1	0.5
DEPADM	1	1	1	1	1	1	1	1	1	0.5
ENGINR	0.5	0.5	0.5	0.5	0.5	1	1	1	1	0.5
PRJMGR	1	1	1	1	1	1	1	1	1	0.5
TPSREP	1	1	1	1	1	2	2	2	2	1
ENGPRC	-	-	-	-	-	2	2	2	2	1
TPSREP	1	1	1	1	1	1	1	1	1	0.5
ENGELE	0.5	0.5	1	1	1	1	1	1	2	1
WSTENG	-	-	-	-	-	-	-	-	1	0.5
WSTMGR	-	-	-	-	-	-	-	-	0.1	0.05
ODGS										
FILTRATION SUBCONTRACT	\$12,500									\$9000
GEO TECH SUBCONTRACT	\$50,000									
TRAVEL TO OAK RIDGE										
GAT CONTRACT	\$6,000									

~~1.4) Subtask # 4 Final Design Package~~

~~1.4)1 Plan/Scope Final Design Package~~

~~The Final Design Package will be prepared and verified by Jacobs Engineering consistent with the requirements of FEMP Procedure No. ED 12-4004, Design Package. The documentation, which comprises the Final Design Package, including the expected level of detail of the components, is identified in **Appendix A**.~~

~~The Final Design Package will demonstrate the appropriate integration of requirements and criteria into the design, and once approved, will include certified for construction (CFC) drawings and specifications for the IFB Packages.~~

~~Selected Silos 1 and 2 Site Engineering team members will assist Jacobs Engineering throughout the development and preparation of the Final Design Package and will participate in "over the shoulder" reviews to expedite the preparation of the required documentation. Fluor Fernald Safety Analysis team members will closely interface with Jacobs Engineering throughout the development of the Final Design to ensure consistency, continuity, and completeness with the Safety Basis Documentation (**Section 1.5.3.4**). The Silos 1 and 2 Site Engineering team will involve all appropriate parties (i.e., construction, operations, etc.) in the review of the design package, so that the verification of the Final Design Package will satisfy the requirements of FEMP Procedure Number, ED 12-4010, Design Verification. The entire Final Design Package will be issued by the Silos 1 and 2 Project Team as a formal submittal for internal review. DOE FEMP will be provided an informational copy to stay abreast of the design status.~~

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~~Individual components and documents supporting the Final Design Package may be submitted, as they become available to expedite the final review process and to allow comments to be resolved into follow-on revisions. Each document will be issued as a unique record through the FEMP ECDC and be revised accordingly from its previous submittal according to the Record Management Program (to include Configuration Management).~~

~~EM-PDRI CD 2/3 Self Assessment~~

~~In support of the application of DOE Order 413.3 to the Silos 1 and 2 Project, in parallel and just prior to the completion of the Final Design Package, the project team will perform a self assessment of the project's maturity using the process described in Section 1.2.3 of this Closure Plan. It is assumed that DOE review and approval of the EM-PDRI assessment report at this CD 2/3 milestone will only take 20 days. DOE's comments or recommendation will be appropriately incorporated in the Silos 1 and 2 Project Documentation.~~

The schedule for the Final Design Package is summarized by the Activity Hammock No. 101720, Final Design package, having a total of 238 days of duration. Jacobs Engineering will provide a more detailed resource loaded schedule, including activity milestones, within 60 days following the kickoff of the Preliminary Design Package. Upon review and acceptance by the Fluor Fernald Project Team, this schedule will be incorporated into the Silos 1 and 2 baseline closure planning documents.

1.4)2 Quantification - Final Design Package

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Table 1.5-28 summarizes the resources for the preparation of the Silos 1 and 2 Final Design Package.

**TABLE 1.5-28
 FINAL DESIGN PACKAGE RESOURCE SUMMARY**

RESOURCE CODE	2002								2003			
	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
LABOR (FTEs)												
JACOBS (TPHO)	22	44	40	40	40	32	32	32	23	23	23	5
DURATEK (TPHO)	4	4	4	4	4	4	4	4	4	4	4	4
DURATEK (TPHO)	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CLERKS	0.5	1	1	1	1	1	1	1	1	1	1	1
DEPADM	0.5	1	1	1	1	1	1	1	1	1	1	1
DRFCAD	-	-	-	-	-	-	-	-	-	-	-	0.1
ENGINR	0.5	1	2	2	2	2	2	2	2	2	2	2
PRJMGR	0.5	1	1	1	1	1	1	1	1	1	1	1
TPSREP	1	2	2	2	2	1	1	1	1	1	1	1
ENGPRC	1	2	2	2	2	1	1	1	1	1	1	1
TPSREP	0.5	1	1	1	1	1	1	1	1	1	1	1
ENGELE	1	2	2	2	2	2	2	2	2	2	2	1.5
WSTENG	0.5	1	1	1	1	1	1	1	1	1	1	1
WSTMGR	0.05	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ODCS												
TRAVEL TO OAK RIDGE (Basic: (5) 3-day trips at \$855/trip)	\$4,275 each month											

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2) ~~Task #2 Title III Services~~

2.1) ~~Plan/Scope Title III Services~~

General

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~~Fluor Fernald and Jacobs Engineering will jointly perform Title III Design responsibilities. Silos 1 and 2 Site Engineering will provide a project engineer for each construction contract (i.e., civil, electrical, mechanical) throughout construction and SOT activities. This individual will serve as a point of contact for resolving engineering and design issues, which effect the CFC design package, construction and startup of remediation facilities. Jacobs Engineering home office support will be used as required to resolve technical issues (i.e., DCNs, requests for clarification or information, etc.) relating to the CFC Design Packages, home office review of vendor submittals, field inspection during construction, and support of construction acceptance testing.~~

Procurement Services

~~Jacobs Engineering will provide support at various points during the Silos 1 and 2 long-lead procurement activities (i.e., review of vendor submittals, inspection during fabrication, inspection at delivery. Duratek Services will also provide technical support to the Source Evaluation Board's evaluation of proposals for manufacturing the disposal container for the treated Silos 1 and 2 material.~~

CADD

~~Jacobs Engineering will provide computer aided drafting and design (CADD) services throughout the entire Silos 1 and 2 Project. Jacobs Engineering will be responsible for receiving all "redline" drawings, incorporating design change notices, and maintaining a set of current as-built drawings throughout construction and SOT activities.~~

~~Jacobs Engineering will interface with the Fluor Fernald Silos 1 and 2 Site Engineering team to ensure that all "redline" drawing information pertaining to FEMP infrastructure drawings are forwarded in a timely manner and incorporated by FEMP Engineering Services CADD personnel.~~

Inspections, Surveillances, and Audits

~~Fluor Fernald will be responsible for all inspections, surveillances and audits throughout this project. A graded approach to assessments, inspections, and testing will be used to ensure that resources applied are commensurate with the performance grade or hazard category assigned to the system, structure, or component.~~

~~Prior to the completion of the Preliminary Design Package a schedule of inspections and acceptance tests will be developed and maintained in order to ascertain that specified items are correct and acceptable for use.~~

Design Change Notices

~~Based on past project experience, it is assumed that eight (8) DCNs will be processed per month throughout the construction, construction acceptance testing and system operability testing phases. Any DCNs, which revise EPA approved documents, must be submitted to the EPA for review and approval.~~

Design Closeout Report

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~~A Design Closeout Report will be prepared by Jacobs Engineering and submitted at the end of start up testing. At a minimum the package will include a general project/scope of work description, lessons learned from design disciplines, as built copies of all drawings, a finalized equipment list, O&M manuals for all equipment, completed system design descriptions, and deviation/change order "hold" items.~~

~~The Title III Services for the Silos 1 and 2 Project is represented by the Hammock Activity Number 101750, "Title III Services." This activity is logically tied to the completion of Fluor Fernald Acceptance of the Final Design (Activity Number 101732) and the beginning of the preparation of the Civil IFB packages (Activity Number 121010). Title III Services will complete with Fluor Fernald's acceptance of the Design Closeout Report (Activity Number 102024) see Section 1.5.3.2.2. The duration of this task is 698 days. Progress on this activity will be apportioned in relation to the progress of the IFB Procurement Processes, Construction and GAT activities.~~

2.2) Quantification Title III Services

~~Table 1.5-29 provides a summary of the resources necessary to support Title III Services for the Silos 1 and 2 Project. For labor planning purposes, it is assumed that there will be 200 drawings in the Final Design Package, which will need to be maintained throughout the life of the project. It is estimated that it will take an average of 20 manhours/drawing for incorporating all "redlines" into the as built drawing packages. In addition to redlines, it is assumed that Jacobs Engineering support will be necessary to process an estimated 8 DCN's per month throughout the duration of the construction and system operability testing phases, requiring a total of 60 manhours (Jacobs Engineering)/DCN. This includes 40 manhours of engineering discipline labor support and 20 manhours of CADD labor support per DCN.~~

~~It is planned that Fluor Fernald Engineering Services will only be required to incorporate all pertinent redline information into the FEMP infrastructure drawings.~~

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For labor planning purposes, it is assumed that the following FEMP site infrastructure drawings from the noted disciplines will be required to be updated to reflect Silos 1 and 2 as-built conditions.

TABLE 1.5-29
SUMMARY OF FEMP SITE INTERFACE DRAWINGS
REQUIRING AS-BUILT MODIFICATIONS

Quantity	Drawing
2	Fire Protection
2	Stormwater Drainage
2	Electrical/Power
2	Mechanical
2	Communications/Data
2	Piping
2	General Arrangements
2	RCS (AWR)
20	
16	Total Drawings
36	

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It is assumed that it will require 20 manhours/drawing to incorporate all "redline" information into the FEMP infrastructure drawings.

Table 1.5-30 provides a summary of the Jacobs Engineering resources for Title III Services.

TABLE 1.5-30
SUMMARY OF JACOBS ENGINEERING TITLE III SERVICES

RESOURCE CODE	FY03	FY04	FY05	FY06
LABOR (FTEs)				
JACOBS PROCESS (TPHO)	1	1	1	1
JACOBS MECH. (TPHO)	1	1	1	1
JACOBS PIPING (TPHO)	1	1	1	1
JACOBS I/C (TPHO)	0.4	0.4	1	1
JACOBS ELECT. (TPHO)	0.4	0.4	0.4	0.4
JACOBS CIVIL (TPHO)	0.4	0.4	0.1	0.1
JACOBS STRUCT. (TPHO)	0.4	0.4	0.1	0.1
JACOBS MGMT (TPHO)	0.4	0.4	0.4	0.4
TOTAL	5	5	5	5

3) ~~Task #3 Container Design and Testing~~

~~The major concern associated with the treatment and disposal of the Silos 1 and 2 material is the radiological exposure to the remediation workers. The gamma dose associated with the daughter products of radium-226 in the Silos 1 and 2 material requires that the process facility (i.e., transfer lines, equipment) and waste packaging provide adequate shielding to ensure that worker exposure is maintained ALARA.~~

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~~Based upon previous engineering studies, containers that can be economically used to dispose the treated Silos 1 and 2 material in accordance with the specified requirements may not be commercially available. However, it is assumed that an existing container design can be modified to provide an optimal packaging solution for the treated Silos 1 and 2 material. Once an acceptable container design has been tested and certified, it is assumed that fixed price turnkey contractor(s) will be procured to design, test, certify, manufacture, and deliver the specified container.~~

~~The design basis for the Silos 1 and 2 disposal container is addressed as a component of the engineering and design effort under Activity No. 101615, Silos 1 and 2 Design Basis Package. The Design Basis Package will be prepared by the project team and will identify all the performance requirements, specific criteria, and assumptions for the design of the container.~~

~~The schedule for all the Container Design activities is summarized under the Activity Hammock No. 101800. The resources will be managed and reported under charge no. HS1AC. The following sections describe how the scope, schedule, and resources of the Container Design will be managed and reported under the following six (6) key activities:~~

- ~~1) Container Analysis and Survey Report;~~
- ~~2) Preliminary Container Design Package;~~
- ~~3) Final Container Design Package;~~
- ~~4) Container Test Plan;~~
- ~~5) Container Fabrication and Testing; and~~
- ~~6) Container Test Report.~~

~~The certified design and specifications for the container developed under this effort will be used as a basis for the procurement of supplier(s) to provide containers for the Silos 1 and 2 treatment operations.~~

~~3.1) Subtask #1 - Container Analysis and Survey Report~~

~~3.1)1 Plan/Scope - Container Analysis and Survey Report~~

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~~Due to the radiological characteristics of the Silos 1 and 2 material, the treated wasteform has been modeled over the anticipated waste loading range of 15 to 40 wt% and found to exhibit a direct radiation field upon contact ranging between 130-340 mrem/hour. The cumulative worker exposure associated with the processing and handling of thousands of containers of treated Silos 1 and 2 material could be significant. The selected container design must be developed in accordance with ALARA principles. Therefore, an analysis of commercially available packaging, processing options, container shielding options and transport configurations over the anticipated waste loading range of 15-40 wt% needs to be evaluated with ALARA principles to determine whether the development of a customized package is warranted.~~

~~Preferably, a commercially available container can be identified for the waste loading range that is optimized with respect to following factors:~~

- ~~• To balance the capital cost of the treatment process with the cost of waste disposal;~~
- ~~• To maximize payload to minimize the number of containers and shipments that would be required to transport the material to NTS;~~
- ~~• To provide the necessary shielding to meet the DOT radiation level requirements for transporting radioactive material without requiring additional shielding on the conveyance (if feasible);~~
- ~~• To minimize contact dose to workers associated with shipment preparation; and~~
- ~~• To provide a seal that prevents radon emanation.~~

~~A survey report will be prepared which summarizes the commercially available containers, the scenarios considered, and the rough order of magnitude cost for the most promising scenarios. This report will be used as the basis for proceeding with the development of a container and conceptual process design for the treated Silos 1 and 2 material.~~

~~The schedule for the container analysis and survey report is summarized under Activity Number 101801. The activity is a 50/100% milestone and has a duration of 60 workdays. This activity is logically tied to be performed in parallel with the preparation of the Design Basis Package. The activity will finish before the Design Basis Package is complete so that the results can be incorporated into the final Design Basis Package provided to Jacobs Engineering.~~

~~3.1)2 Quantification Container Analysis and Survey Report~~

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~~Silos 1 and 2 Site Engineering personnel will consolidate and forward applicable background information to Duratek personnel, who have been matrixed to perform this task. Silos 1 and 2 Site Engineering personnel are planned under Project Management, Charge No. HS1AA. Duratek (TPHO) is estimated to provide 360 manhours through their home office for this task.~~

~~3.2) Subtask #2 Preliminary Container Design Package~~

~~3.2)1 Plan/Scope Preliminary Container Design Package~~

~~The Duratek teaming partners will be used to develop a Preliminary Container Design Package for peer review by Duratek, Fluor Fernald (including the Technical Review Board (TRB) and the ISRC, DOE FEMP, and the DOE Nevada Operations Office (NV) prior to finalization of the container design.~~

~~The Preliminary Container Design Package will be developed and submitted prior to fabrication and testing of containers. The Preliminary Container Design Package will include the Container Analysis and Survey Report, Container Design Specifications, container drawings (including bills of materials, assembly, and details), shielding calculations, ALARA analysis and a NTS and DOT Requirements compliance analysis. The Preliminary Container Design Package will also provide demonstrated compatibility of the treated wasteform with the container's materials of construction, control of radon emissions for the package, and the integration of the Container Design Package with the applicable systems within the full scale facility design and Safety Basis Documentation.~~

~~Table 1.5-31 summarizes the schedule for developing the Preliminary Container Design Package. All activities are assumed to have "finish to start" relationships. Progress on this activity will be reported in accordance with the 20%, 70%, 80%, and 100% milestones associated within the completion of the respective activities.~~

**TABLE 1.5-31
 SCHEDULE SUMMARY PRELIMINARY CONTAINER DESIGN PACKAGE**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101850	Preliminary Container Design Package (Hammock)	111	--
101804	Prepare Preliminary Container Design Package (Start)	0	20%
101804	Prepare Preliminary Container Design Package (Complete)	60	70%
101808	Fluor Fernald Review Preliminary Design Package—Containers	31	80%
101812	Incorporate Comments into Preliminary Container Design Package	20	100%

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3.2)2 Quantification—Preliminary Container Design Package

~~Table 1.5-32 summarizes the resources for completing the Preliminary Container Design Package activities.~~

**TABLE 1.5-32
 SUMMARY OF RESOURCES FOR THE PRELIMINARY CONTAINER DESIGN PACKAGE**

RESOURCE CODES	ACTIVITY NO. 101850 TOTAL RESOURCES
Labor (FTEs)	
DURATEK (TPHO)	-4
ODGs	
Travel (NTS) 4 man trips	\$12,000
Federal Express	\$100
Subtotal ODCs	\$12,100

~~It is assumed that (4) FTEs of Duratek Engineering and CADD support will be involved in the preparation of the container design documentation. Silos 1 and 2 Site Engineering team members will provide over the shoulder review and coordinate review of the design package with FEMP Organizations [e.g., Waste Generator Services, Waste Acceptance Organization, Independent Safety Review Committee (ISRC), TRB, etc.]. Fluor Fernald support management and oversight labor is planned in Project Management, Charge No. HS1AA. In addition, DOE NV representatives will be involved in the development of the container design for acceptance with the NTS WAC.~~

~~3.3) Subtask #3 Final Container Design Package~~

~~3.3)1 Plan/Scope Final Container Design Package~~

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~~Based upon resolution of comments on the Preliminary Container Design Package, the Duratek team shall prepare a Final Container Design Package for review and approval by Duratek, Fluor Fernald, and the NTS prior to construction and testing of the prototype containers.~~

~~The Final Container Design Package would include the most recent revisions of all the documentation submitted in the Preliminary Container Design Package based upon comment resolution and documentation by Fluor Fernald and Duratek. The package would also include specified documentation supporting Fluor Fernald's performance grading of the container and safety basis documentation specific to the container and the container handling and storage design of the remediation facility. This includes the manufacturer's specifications and procedures for container fabrication, handling, loading, and lid fastening and identify all QA testing and inspections. Fluor Fernald will coordinate the preparation and closure of comment resolutions on the Final Container Design Package with the FEMP organizations. Duratek will not initiate prototype container fabrication until it receives Fluor Fernald approval of the Final Container Design Package.~~

~~Table 1.5-33 summarizes the schedule for developing the Final Container Design Package. All activities are assumed to have "finish to start" relationships.~~

**TABLE 1.5-33
 FINAL CONTAINER DESIGN PACKAGE SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101860	Final Container Design Package (Hammock)	132	--
101816	Prepare Final Container Design Package	40	60%
101820	Prepare Test Plan	40	--
101828	Fluor Fernald review Final Container Design Package	31	75%
101832	Incorporate Comments into Final Container Design Package	20	95%
101836	Fluor Fernald Acceptance Final Container Design Package	5	100%

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During Fluor Fernald's review of the Final Container Design Package, Activity No. 101828, the Silos 1 and 2 Site Engineering team will be coordinating the parallel reviews by the ISRC, TRB, DOE-FEMP, and the DOE-NV organizations.

3.3)2 Quantification Final Container Design Package

Table 1.5-34 summarizes the Duratek resources for completing the Final Container Design Package activities.

**TABLE 1.5-34
 FINAL CONTAINER DESIGN PACKAGE RESOURCE SUMMARY**

RESOURCE CODES	ACTIVITY NO. 101860 TOTAL RESOURCES
Labor (FTEs)	
DURATEK (TPHO)	4
DURATEK CADD (TPHO)	1.5
ODGs	
Travel (NTS)	\$8,000
Subtotal ODCs	\$8,000

~~3.4) Subtask #4 - Container Test Plan~~

~~3.4)1 Plan/Scope - Container Test Plan~~

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~~The Duratek Engineering Services personnel would prepare and submit a Container Test Plan and test schedule to Fluor Fernald for review and concurrence. The Container Test Plan would identify all the required destructive and non-destructive tests and describe the procedure by which the container test subcontractor will independently certify that the container meets all the technical and performance requirements. The test plan would include test objectives, design and certification test procedures, test equipment and materials, sampling data collection and analysis plan, data management, data analysis and evaluations, QA/QC, progress reporting, test schedule, management and staffing, and a certification plan.~~

~~It is assumed that the Duratek Engineering Services will prepare the Container Test Plan in parallel with the preparation of the Final Container Design Package.~~

~~The container subcontractor shall not perform container testing until it receives Fluor Fernald concurrence on the Container Test Plan.~~

~~3.4)2 Quantification - Container Test Plan~~

~~It is assumed that Duratek Engineering Services will submit the Test Plan for Fluor Fernald review together with the Final Container Design Package submittal. Therefore, the Duratek resources for preparing, reviewing, and commenting on the Test Plan have been included in the resource planning for review of the Final Container Design Package (Table 1.5-34).~~

~~3.5) Subtask #5 Prototype Container Fabrication and Testing~~

~~3.5)1 Plan/Scope Prototype Container Fabrication and Testing~~

~~Prototype container fabrication and testing would be conducted in accordance with the approved Final Container Design Package and the Container Test Plan, to ensure that containers meet or exceed the design specifications required by the DOT, the NTS WAG, and the FEMP site requirements. It is assumed that the prototype container fabrication and testing will be conducted off site at the subcontractor's facilities. Duratek will be required to have independent testing by a qualified vendor to verify containers meet testing requirements (vendor to be approved by Fluor Fernald). Fluor Fernald Site Engineering and QA personnel may be present during the manufacturer's fabrication and testing of the container subcontractor's shipping containers. In addition, Fluor Fernald personnel may perform periodic inspections of the container subcontractor's or lower tier subcontractor's container manufacturing and testing facilities.~~

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~~Table 1.5-35 summarizes the schedule for the fabrication and the testing of the containers.~~

**TABLE 1.5-35
 CONTAINER FABRICATION AND TESTING SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101840	Testing Containers (HAMMOCK)	80	-
101844	Materials Testing	40	50%
101904	Container Fabrication	20	75%
101908	Test Prototype Containers	20	100%

~~It is assumed that the container fabrication and testing activities will not begin until the Final Container Design Package and Container Test Plan are approved.~~

~~At the completion of testing, the container subcontractor will provide several prototype containers to Fluor Fernald to support the development of training documentation and worker material handling experience.~~

~~3.5)2 Quantification Prototype Container Fabrication and Testing~~

~~Table 1.5-36 summarizes the resources for completing the container fabrication and testing activities.~~

**TABLE 1.5-36
 CONTAINER FABRICATION AND TESTING RESOURCE SUMMARY**

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RESOURCE CODE	ACTIVITY NO. 101840 TOTAL RESOURCES
Labor (FTEs)	
Duratek (TPHO)	2
ODCs	
Container Subcontractor	\$140,000
Prototype Container Cost	\$49,200
Preparation Test	\$20,000
Transportation Cost	\$10,350
Testing	\$81,000
Travel	\$20,000
Subtotal ODCs	\$320,500

3.6) Subtask #6 Container Test Report

3.6)1 Plan/Scope Container Test Report

Duratek Engineering Services will prepare and submit a Container Test Report to Fluor Fernald, for review and concurrence. The test report will include test descriptions, test results, conclusion, final container test plan, pre-test inspections, test data sheets, test exceptions, test equipment, calibration documentation, photographs, and container certification.

Table 1.5-37 summarizes the schedule for developing the Container Test Report. It is assumed Duratek's preparation of the Container Test Report will begin before the container testing activities are complete. However, only 25 workdays would be on the critical path schedule.

**TABLE 1.5-37
 CONTAINER TEST REPORT SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102100	Container Test Report (Hammock)	90	--
102104	Prepare Container Test Report (Start)	0	20%
102104	Prepare Container Test Report (Complete)	65	70%
102108	Fluor Fernald Review Container Test Report	10	80%
102112	Incorporate Review Comments into Container Test Report	10	90%
102116	Fluor Fernald Accepts Container Test Report	5	100%

3.6)2 Quantification - Container Test Report

Table 1.5-38 summarizes the resources for completing the Container Test Report activities.

**TABLE 1.5-38
 CONTAINER TEST REPORT RESOURCE SUMMARY**

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RESOURCE CODE	ACTIVITY NO. 102400 TOTAL RESOURCES
Labor (FTEs)	
Duratek (TPHO)	1
ODCs	
Travel (\$2,000 per trip)	\$2,000
Subtotal ODCs	\$2,000

4) Task # 4 - Safety Basis

The project Safety Basis is defined as the combination of information relating to the control of hazards at a nuclear facility (including design, engineering analysis, and administrative controls), upon which the DOE bases its conclusion that the activities at the facility can be conducted safely. The Silos 1 and 2 Project activities will be categorized by its hazards severity following the criteria set forth in DOE-EM-STD-5502-94. This hazard categorization dictates the documentation required for assessing the hazards associated with the planned activities and establishing the Authorization Basis for performing the activities. The Safety Basis will be critically linked to the design, construction, and operation of the Silos 1 and 2 remediation facility.

The Hazard Category (HC) is also used to establish the level of effort for other Fluor Fernald programs such as Performance Grading, ORR, Conduct of Operations (CONOPS), and Price Anderson Amendment Act (PAAA) QA reporting. Safety analyses, using a graded approach per DOE technical standards, are the mechanisms used to determine the HC of a facility or activity. DOE may direct that a higher HC designation be applied if it believes there are extenuating circumstances in the project or activity, such as implementing a new technology. Such direction could be the basis for a change order.

Fluor Fernald, has designated the Silos 1 and 2 TTA as an HC-3 Nuclear Facility. The current safety basis for the facility is documented in the Basis for Interim Operations PL-3049, Section K and its supporting documents. This safety basis documentation will be integrated into the safety basis documentation for the Silos 1 and 2 Project.

~~Jacobs Engineering will be responsible for the preparation of the Safety Basis Documentation as part of their engineering and design activities. The Silos 1 and 2 Safety Analysis Team and Site Engineering Team members will provide seamless support to Jacobs Engineering by providing document preparation guidance and over the shoulder reviews of the Safety Basis Documentation relative to the format, level of detail, and the control of changes between the safety documentation and the engineering and design effort.~~

~~The scope, schedule, and resources for the Silos 1 and 2 Safety Basis will be managed and reported by the following six (6) key safety documents:~~

- ~~1) Safety Basis Documentation Implementation Plan;~~
- ~~2) Conceptual Safety Basis Document;~~
- ~~3) Preliminary Safety Basis Document;~~
- ~~4) Final Safety Basis Document;~~
- ~~5) Preliminary Safety Analysis Report; and~~
- ~~6) Final Safety Analysis Report.~~

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~~The schedule for all the Safety Basis activities is summarized under the Activity Hammock No. 106500. The resources will be managed and reported under charge number HS1AG. The following sections describe the scope, schedule, and planned resources for these key activities.~~

~~4.1) Subtask #1 Safety Basis Documentation Implementation Plan~~

~~4.1)1 Plan/Scope Safety Basis Documentation Implementation Plan~~

~~Fluor Fernald, with Jacobs Engineering support, will prepare a Safety Basis Documentation Implementation Plan (SBDIP) consistent with FEMP site procedure NS 0005, Rev.3. At a minimum, the SBDIP will include an identification and basic description of the segments, a preliminary site plan indicating the segment locations with respect to each other and at least two FEMP landmarks, a preliminary process block diagram, preliminary hazard assessments (PHA) and hazard category calculations (HCCs), a schedule for completion of the documentation, a description of the methodology to be used for the verification of the implementation of safety basis for the respective segment, and the approach for integration with the engineering and design effort.~~

~~The preparation of the SBDIP will begin immediately following the preparation of the Design Basis Package. The schedule for the SBDIP is summarized by the following activities in **Table 1.5-39**.~~

**TABLE 1.5-39
 SBDIP SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
106510	SBD Implementation Plan (Hammock)	75	-
106514	Prepare SBDIP	25	33%
106518	Review and Comment on SBDIP	20	60%
114048	Project Team Present SBDIP to ISRC	-	-
111004	Incorporate Comments/Finalize SBDIP	20	85%
111008	Review/Approve SBDIP	10	100%

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The schedule includes the Project Team performing a formal presentation of the SBDIP to the ISRC. The presentation will serve to formally "kickoff" and focus the review of the SBDIP by the ISRC. Since the SBDIP will describe the method and framework for developing the safety basis documentation, the completion of the SBDIP process should finish no later than the completion of the Conceptual Safety Basis Document.

4.1)2 Quantification Safety Basis Documentation Implementation Plan

The SBDIP for the Silos 1 and 2 Project will be prepared by Silos 1 and 2 Site Engineering team members using FEMP Safety Analysis team members as independent resources for review and guidance. Selected Duratek and Jacobs Engineering personnel will peer review the preparation of the draft SBDIP. The resources required for completion of the SBDIP are planned under Project Management, Charge No. HS1AA.

4.2) Subtask #2 Conceptual Safety Basis Document

4.2)1 Plan/Scope Conceptual Safety Basis Document

Fluor Fernald will assist Duratek's preparation of the Conceptual Safety Basis Documentation in parallel with the early Preliminary Design Package. The Conceptual Safety Basis Document will be supported by several structured evaluations and analyses which include: Accident Analysis, ALARA Analysis, HCCs, Fire Hazard Analysis (FHA), Human Factors Evaluation (HFE), and Integrated Hazard Analysis (IHA).

The Conceptual Safety Basis Document will be developed in parallel to the engineering and design effort. The results of the evaluations and analysis conducted in support of the safety basis documentation will be appropriately considered and integrated into the ongoing engineering and design effort. Likewise, as the engineering and design effort evolves, new information and design details will be evaluated by the appropriate safety analysis. Throughout the entire safety basis documentation process, Fluor Fernald Safety Analysis team members will work closely with Duratek and Jacobs engineering and design personnel to ensure this interface is effective.

The preparation of the Conceptual Safety Basis Document and its supporting documentation will begin immediately following the preparation of the Design Basis Package. Any changes in these documents would be incorporated as appropriate into the ongoing Conceptual Safety Basis Document and its supporting documentation. The schedule for the Conceptual Safety Basis Document and its supporting documentation is summarized by activity in Table 1.5-40.

**TABLE 1.5-40
 CONCEPTUAL SAFETY BASIS SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102000	Conceptual Safety Basis Document	145	-
Safety Basis Support Documentation Components			
112044	Conceptual Accident Analysis	75	16%
112048	Conceptual ALARA Analysis	75	16%
112052	Conceptual HCCs	75	16%
112056	Conceptual FHA	75	16%
112060	Conceptual HFE	75	16%
112064	Conceptual IHA	75	20%

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Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can effect each other significantly. Therefore, for reporting purposes earned value will be weighted based on the identified milestones.

4.2)2 Quantification Conceptual Safety Basis Document

The Conceptual Safety Basis Document and its supporting documentation will be supported by three (3) full time equivalents of centralized Fluor Fernald Safety Analysis team members matrixed to the Silos 1 and 2 Project. These team members will interface directly with Duratek and Jacobs Engineering personnel to ensure that a continuous, thorough and accurate exchange of information takes place. During this timeframe, it is assumed that two (2) Fluor Fernald Safety Analysis team members and one (1) Fluor Fernald Silos Engineering team member would travel twice a month to the Duratek and Jacobs Engineering offices to facilitate communication and ensure the integration of information.

The Fluor Fernald Safety Analysis Organization will provide independent safety review of the safety basis documentation throughout this process. In addition, the FEMP ISRC will be used to provide expert review and input in a designated formal review of the Conceptual Safety Basis Document. The ISRC team is not chargeable to the project.

The planned resources for the development of the Conceptual Safety Basis Document and its support documentation are summarized in ~~Table 1.5-41.~~

**TABLE 1.5-41
 CONCEPTUAL SAFETY BASIS DOCUMENTATION RESOURCE SUMMARY**

RESOURCE CODE	ACTIVITY NO. 102000 TOTAL RESOURCES (146 WORKDAYS)
LABOR (FTEs)	
DURATEK (TPHO)	0.1
ODCs	
Travel (3 members, \$2,000 per trip per member, 14 trips)	\$84,000
Federal Express	\$300
Subtotal ODCs	\$84,300

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~~4.3) Subtask #3 Preliminary Safety Basis Document~~

~~4.3)1 Plan/Scope Preliminary Safety Basis Document~~

~~In parallel to the ongoing development of the Preliminary Design Package, Jacobs Engineering and Fluor Fernald Safety Analysis team members will continue to develop the Preliminary Safety Basis Document. The Preliminary Safety Basis Document will also be supported by the following structured evaluations and analyses using engineering design information from the evolving Preliminary Design Package: Accident Analysis, an ALARA Analysis, HCCs, a FHA, a HFE, and an IHA. The Preliminary Safety Basis Document will include the most recent revisions of all the documentation submitted in the Conceptual Safety Basis Document and Conceptual Design Package.~~

~~The preparation of the Preliminary Safety Basis Document and its supporting documentation will continue seamlessly following the preparation of the Conceptual Safety Basis Document. Any changes in these documents would be incorporated as appropriate into the ongoing Preliminary Safety Basis Document. The schedule for the Preliminary Safety Basis Document and its supporting documentation is summarized by activity in ~~Table 1.5-42.~~~~

**TABLE 1.5-42
 PRELIMINARY SAFETY BASIS DOCUMENTATION SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
108000	Preliminary Safety Basis Document	165	-
Safety Basis Support Documentation Components			
112072	Preliminary Accident Analysis	75	16%
112076	Preliminary ALARA Analysis	75	16%
112080	Preliminary FHA	75	16%
112084	Preliminary HCGs	75	16%
112088	Preliminary HFE	75	16%
112092	Preliminary IHA	75	20%

Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can effect each other significantly. Therefore, for reporting purposes earned value will be weighted based on the identified milestones.

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4.3)2 Quantification Preliminary Safety Basis Document

The Preliminary Safety Basis Document and its supporting documentation will be supported by three (3) centralized Fluor Fernald Safety Analysis team members matrixed to the Silos 1 and 2 Project. These team members will continue to interface directly with Duratek and Jacobs Engineering personnel to ensure that a seamless and accurate exchange of information takes place. It is estimated that two (2) Fluor Fernald Safety Analysis team members and one (1) Fluor Fernald Silos Engineering team member would travel twice a month to the Duratek and Jacobs Engineering offices to facilitate the integration of information.

The Fluor Fernald Safety Analysis Organization will provide independent safety review and guidance of the safety basis documentation throughout this process. In addition, the FEMP ISRC will be used to provide expert review and input in a designated formal review of the Preliminary Safety Basis Document. The ISRC team is not chargeable to the project.

The planned resources for the development of the Preliminary Safety Basis Document and its support documentation are summarized in **Table 1.5-43**.

**TABLE 1.5-43
 PRELIMINARY SAFETY BASIS DOCUMENTATION RESOURCE SUMMARY**

RESOURCE CODE	ACTIVITY NO. 108000 TOTAL RESOURCES (165 workdays)
LABOR (FTEs)	
DURATEK (TPHO)	0.1
ODCs	
Travel (3 members, \$1,228 per trip per member, 16 trips)	\$58,944
Federal Express	\$300
Subtotal ODCs	\$59,244

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- 4.4) Subtask #4 Final Safety Basis Document
- 4.4)1 Plan/Scope Final Safety Basis Document

Jacobs Engineering and Fluor Fernald will continue with the preparation of the Final Safety Basis Document in parallel with the Final Design Package. The Final Safety Basis Document will also be supported by the continuing structured evaluations and analyses using updated engineering and design information from the evolving Final Design Package: an Accident Analysis, an ALARA Analysis, HCCs, a FHA, a HFE, and an IHA. The Final Safety Basis Document will include the most recent revisions of all the documentation submitted in the Preliminary Safety Basis Document and Preliminary Design Package.

The preparation of the Final Safety Basis Document and its supporting documentation will continue seamlessly following the preparation of the Final Design Package. Any changes in the supporting documents would be incorporated as appropriate into the ongoing Final Safety Basis Document. The schedule for the Final Safety Basis Document and its supporting documentation is summarized by activity in Table 1.5-44.

**TABLE 1.5-44
 FINAL SAFETY BASIS DOCUMENTATION SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
108300	Final Safety Basis Document	115	-
Safety Basis Support Documentation Components			
112100	Final Accident Analysis	75	16%
112104	Final ALARA Analysis	75	16%
112108	Final FHA	75	16%
112112	Final HCCs	75	16%
112116	Final HFE	75	16%
112120	Final IHA	75	20%

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~~Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can effect each other significantly. Therefore, for reporting purposes earned value will be weighted based on the identified milestones.~~

4.4)2 Quantification Final Safety Basis Document

~~The Final Safety Basis Document and its supporting documentation will be prepared by Jacobs Engineering and supported by centralized Fluor Fernald Safety Analysis team members matrixed to the Silos 1 and 2 Project. These team members will interface directly with Duratek and Jacobs Engineering personnel to ensure that a continuous, complete and accurate exchange of information takes place. Two (2) Fluor Fernald Safety Analysis team members and one (1) Fluor Fernald Silos Engineering team member would travel twice a month to the Duratek and Jacobs Engineering offices to facilitate the integration of information.~~

~~The Fluor Fernald Safety Analysis Organization will provide independent safety review of the safety basis documentation throughout this process. In addition, the FEMP ISRC will be used to provide expert review and input in a designated formal review of the Final Safety Basis Document. The ISRC team is not chargeable to the project.~~

~~The planned resources for the development of the Final Safety Basis Document and its support documentation are summarized in Table 1.5-45.~~

**TABLE 1.5-45
 FINAL SAFETY BASIS DOCUMENTATION RESOURCE SUMMARY**

RESOURCE CODE	ACTIVITY NO. 408300 TOTAL RESOURCES (116 Workdays)
ODCs	
Travel (3 members, \$1,228 per trip per member, 10 trips)	\$36,840
Federal Express	\$300
Subtotal ODCs	\$37,140

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~~4.5) Subtask #5 Preliminary Safety Analysis Report~~

~~4.5)1 Plan/Scope Preliminary Safety Analysis Report~~

~~A Preliminary Safety Analysis Report (PSAR) will be prepared by Fluor Fernald, Inc consistent with DOE STD 3009-94 and FEMP site procedure NS-0005. A PSAR is required for DOE authorization to procure, construct, and test new HC 3 or above Nonreactor Nuclear Facilities. The authorization follows approval of preliminary design as per DOE Order 5480.23, 9.a.(1). The PSAR will be developed in parallel to the early engineering phase of this project to identify safety design criteria, analyze potential hazards, propose measures to eliminate, control, or mitigate these hazards, and analyze potential risks.~~

~~Throughout this process, Fluor Fernald Safety Analysis team members will interface with Duratek and Jacobs Engineering personnel to address and incorporate new information as the engineering and design effort evolves.~~

~~As part of the overall procurement strategy for the Silos 1 and 2 Project, it is planned that specific systems and key components of the Silos 1 and 2 treatment process (i.e., dewatering system, remote handling systems) will need to be procured in advance so that the final design and final Safety Basis Documentation for the "balance of plant" facilities can be completed. This equipment will be identified by Jacobs Engineering as part of the development of the Preliminary Design Package. To minimize the risk associated with committing project funds during the emerging design effort, all long lead procurement actions will be divided into a fixed price contract with an option as follows:~~

- ~~• Fixed price base contract to provide required vendor engineering data, design drawings and performance information for each specified piece of equipment or system;~~
- ~~• Fixed price Option to contract will include the fabrication, testing, installation, and~~

startup of the equipment at the FEMP.

In order to expedite the project schedule, it is assumed that: 1) The DOE approval of the PSAR is not required to award the fixed price base contract; and 2) The DOE approval of the PSAR is the only prerequisite activity to the award of the fixed price option for each long lead procurement action. Section 1.5.4 discusses long lead procurement actions in more detail.

Following receipt of comments on the Draft Preliminary Safety Basis Document, Jacobs Engineering and Fluor Fernald Safety Analysis team members will begin preparation of the PSAR. The schedule for development of the PSAR under Activity Hammock No. 108420 is summarized in Table 1.5-46.

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TABLE 1.5-46
 PSAR SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
108420	PSAR (Hammock)	170	-
108088	Prepare Draft PSAR	25	25%
108092	Fluor Fernald Review and revise Draft PSAR	20	30%
108096	Fluor Fernald/DOE FEMP Review Draft PSAR	20	35%
108100	Incorporate Fluor Fernald and DOE Comments and Revise PSAR	10	50%
109962	ISRC Review PSAR	30	-
108102	Incorporate ISRC Comments and Revise PSAR	20	65%
114024	Fluor Fernald Accepts PSAR	15	75%
114040	ISRC PSAR Closure Meeting	0	-
108104	DOE Review PSAR	30	-
108108	Fluor Fernald Incorporates DOE Comments and Revises PSAR	20	90%
111060	DOE Approves PSAR	0	100%
114032	Present PSAR to ALARA Review Committee	0	-

Following preparation of the Draft PSAR, selected Fluor Fernald project personnel, including personnel from Duratek, Jacobs Engineering, affected FEMP functional area managers, and Fluor Fernald Independent Safety Analysis peer reviewers will review the Draft PSAR. To facilitate the subsequent DOE review and approval of the PSAR, draft copies of the PSAR may be provided to DOE FEMP in advance to solicit early comments for early resolution. It is assumed that DOE will take thirty (30) workdays to formally review and provide written comments to Fluor Fernald Silos 1 and 2 Safety Analysis Team members will close out comment resolutions with DOE FEMP and DOE.

~~4.5)2 Quantification Preliminary Safety Analysis Report~~

~~The Jacobs Engineering resources for the development of the PSAR are planned in Design (Charge No. HS1AC). The Fluor Fernald technical support, management, and oversight resources are planned in Project Management (Charge No. HS1AA).~~

~~4.6) Subtask #6 Final Safety Analysis Report~~

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~~4.6)1 Plan/Scope Final Safety Analysis Report~~

~~A Final Safety Analysis Report (FSAR) will be prepared by Jacobs Engineering and Fluor Fernald, Inc Safety Analysis team members using the guidelines of DOE STD 3009-94 and FEMP site procedure NS 0005. A FSAR is required for DOE authorization to operate the Nonreactor Nuclear Facilities associated with this project. The FSAR follows the final design package as per DOE Order 5480.23, 9.a.(2). The FSAR will be prepared in parallel with construction activities and will be updated to be consistent with design changes and as-built conditions. The FSAR will be developed prior to operation of the remediation facility and will identify hazards, describe and analyze the adequacy of measures taken to eliminate, control, or mitigate these hazards, and analyze and evaluate potential accidents and associated risks.~~

~~Following receipt of comments on the Draft Final Safety Basis Document, Fluor Fernald Safety Analysis team members will begin preparation of the FSAR. The schedule for development of the FSAR Activity Hammock No. 108416 is summarized in Table 1.5-47.~~

**TABLE 1.5-47
 FSAR SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
108416	FSAR (Hammock)	686	-
108388	Prepare Draft FSAR	25	25%
108392	Fluor Fernald Review and Revise Draft FSAR	20	30%
108396	Fluor Fernald/DOE Review Draft FSAR	10	35%
108400	Incorporate Fluor Fernald and DOE Comments and Revise FSAR	10	50%
114020	ISRC Review of FSAR	30	-
108402	Incorporate ISRC Comments and Revise FSAR	20	65%
114028	Fluor Fernald Accepts FSAR	15	75%
114044	ISRC Comment FSAR Closure Meeting	0	-
108404	DOE Review FSAR	30	-
108408	Fluor Fernald Incorporates DOE Comments and Revises FSAR	20	90%
116012	DOE Review FSAR Changes	20	-
108412	DOE Approves FSAR with Safety Evaluation Report (SER)	5	100%
114036	Present FSAR to ALARA Review Committee	0	-

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~~Following preparation of the Draft FSAR, selected Fluor Fernald project personnel, including personnel from Duratek, Jacobs Engineering, affected functional area managers, and Fluor Fernald Independent Safety Analysis peer reviewers will review the Draft FSAR. To facilitate the subsequent DOE review and approval of the FSAR, draft copies of the FSAR may be provided to DOE FEMP in advance to solicit early comments for early resolution. It is assumed that DOE will take thirty (30) workdays to formally review and provide written comments to Fluor Fernald. Fluor Fernald Safety Analysis team members will close out comment resolutions with DOE.~~

~~4.6)2 Quantification Final Safety Analysis Report~~

~~The Jacobs Engineering resources for the development of the FSAR are planned in Design (Charge No. HS1AC). The Fluor Fernald technical support, management, and oversight resources are planned in Project Management (Charge No. HS1AA).~~

5) ~~Task #5 Regulatory Packages~~

~~Regulatory documentation packages will be developed and submitted to the EPA and OEPA for review and approval. Once approved by the EPA and OEPA, the regulatory packages will become controlling documents for the implementation of the requirements of this Closure Plan.~~

Regulatory Submittal Process

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~~DOE is the lead agency for all remediation activities at the FEMP. All communication with the EPA, OEPA, and other agencies is coordinated by DOE and Fluor Fernald. Fluor Fernald is responsible for preparing all submittals that gain approval by the EPA and OEPA.~~

~~The following discussion identifies the submittal process to the EPA and OEPA:~~

- ~~• Documents requiring EPA and OEPA review and approval will be provided to DOE for review and approval in accordance with this closure plan (Section 1.2.4);~~
- ~~• Upon approval by Fluor Fernald, and DOE, DOE will provide the document to EPA and OEPA for concurrent review and approval;~~
- ~~• Fluor Fernald will allow 60 calendar days for concurrent reviews by EPA/OEPA;~~
- ~~• EPA/OEPA will provide written comments to DOE, who upon receipt in turn will provide the comments to Fluor Fernald for resolution;~~
- ~~• Fluor Fernald will assess the EPA/OEPA's comments to determine which organization should prepare a draft response. Fluor Fernald will notify Jacobs Engineering of the comments they are responsible for from the EPA/OEPA;~~
- ~~• If any review comments require clarification, Fluor Fernald will notify DOE and/or contact the EPA/OEPA directly (with concurrence of DOE);~~
- ~~• Fluor Fernald will prepare a draft "Comment Response Document." The response to comments document will be in a traditional format and will provide for each comment: a restatement of the comment, a proposed response to the comment, and an identification of the action to be taken on the document to reflect the proposed response;~~
- ~~• It may or may not be necessary to submit a revised document along with the~~

~~comment response document to the EPAs. Change pages may be submitted by Fluor Fernald in lieu of a complete revision of the deliverable;~~

- ~~• To assist the EPAs with comment resolution, the Fluor Fernald will provide a copy of final comment responses, final comment resolutions and a "redline/strikeout" version of the document, as appropriate, indicating all changes made to the document;~~
- ~~• Fluor Fernald will allow the EPAs 60 calendar days from their receipt of the comment response document and revised documentation to review and approve the document, or provide additional comments;~~
- ~~• Upon receipt of EPA/OEPA written approval, Fluor Fernald will begin implementation of the activities identified in the approved document.~~

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~~It is assumed that all meetings with the EPA and OEPA related to the resolution of comments on all the Silos 1 and 2 RD/RA deliverables will be conducted at the FEMP. Therefore, no travel budget has been included in this Closure Plan for EPA/OEPA comment resolutions.~~

~~The scope, schedule, and resources for preparing Regulatory Packages will be managed by the following six (6) key regulatory document submittals:~~

- ~~1) Revised Remedial Design Work Plan;~~
- ~~2) Remedial Design Package;~~
- ~~3) Remedial Action Work Plan;~~
- ~~4) Remedial Action Package;~~
- ~~5) NTS Disposal Evaluation; and~~
- ~~6) Transportation and Disposal Plan.~~

~~The schedule for development of all regulatory packages is summarized under the Activity Hammock No. 100012, RD/RA Deliverables. The resources will be managed and reported under charge number HS1AC. The following sections describe the scope, schedule, and planned resources for the regulatory packages.~~

~~5.1) Subtask #1 Revised Remedial Design Work Plan~~

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~~In September 2000, the EPA and OEPA approved the Remedial Design Work Plan (RDWP) for the OU4 Silos 1 and 2 Project, Rev. 0, (40700 WP-0003). The EPA recognized that the Silos 1 and 2 remediation strategy proposed by the Contractor under the new FEMP Site Closure Contract could vary from that which was originally approved by EPA. The EPA approved RDWP provides for the revision and resubmittal of a revised Silo 1 and 2 RDWP to the EPA and OEPA for approval once a final path forward for the Silos 1 and 2 is baselined.~~

~~5.1)1 Plan/Scope Revised Remedial Design Work Plan~~

~~Fluor Fernald Silos Project Team will develop a revised RDWP for submittal and approval by the EPA and the OEPA. The RDWP will reflect the implementation strategy identified in this Closure Plan, briefly discuss how the remedial design will be accomplished, define the contents of the specified regulatory submittals, and establish the enforceable milestones for the RD submittals to the regulatory agencies.~~

~~It is assumed that the revised RDWP will be prepared following completion of the ongoing rebaselining effort for the Silos 1 and 2 Project. This regulatory submittal must be reviewed and approved by DOE FEMP, prior to its submittal to the EPA and OEPA. Based upon past project experience, it is assumed that DOE FEMP will only require ten (10) working days to review the draft RDWP. In accordance with the Amended Consent Agreement, as amended, it is assumed that EPA and OEPA will require 60 calendar days (40 working days) to both review and approve the RDWP. The following Table 1.5-48 summarizes the planned activities and milestones for reporting progress for this effort.~~

**TABLE 1.5-48
 RDWP SCHEDULE**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
100017	RDWP (Hammock)	100	-
100022	Fluor Fernald Prepare Draft RDWP	20	20%
100027	Fluor Fernald Review Draft RDWP	10	30%
100032	Fluor Fernald Revise Draft RDWP	5	-
100037	DOE FEMP Review Draft RDWP	10	-
100042	Fluor Fernald Revise RDWP	5	50%
100047	EPA/OEPA Review RDWP	40	75%
100052	Fluor Fernald Revise RDWP	10	90%
100057	EPA/OEPA Review RDWP and Approve RDWP	40	100%

5.1)2 Quantification Revised Remedial Design Work Plan

The revised RDWP will be prepared by Fluor Fernald Silos 1 and 2 Engineering team members, and peer reviewed internally by selected Duratek and Fluor Fernald personnel. Fluor Fernald team members will address comments resulting from the peer review, DOE review, and EPA/OEPA review cycles and revise the document accordingly. The labor resources for developing the RDWP are planned in Project Management, Charge No. HS1AA. The ODCs for developing the RDWP are summarized in Table 1.5-49.

**TABLE 1.5-49
 SUMMARY OF RESOURCES FOR THE RDWP**

RESOURCE CODE	TOTAL RESOURCES
FEDEX	\$300
CRITICAL ANALYSIS TEAM SUBCONTRACT	\$3,000
Total ODCs	\$3,300

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5.2) Subtask #2 Remedial Design Package

5.2)1 Plan/Scope Remedial Design Package

Jacobs Engineering will submit principal elements of the preliminary design submittals which will be compiled into the single RD Package by Fluor Fernald for EPA/OEPA review and approval. The RD Package will describe the design and operation of the remediation facility to successfully stabilize the Silos 1 and 2 material in a manner that will ensure protection of worker and public health, safety, and the environment. The RD Package will also describe the environmental controls that will be used during construction and operations activities of the facility to ensure protection of human health and the environment. Appendix A, Section 7.2 identifies the individual components and their level of detail for the RD Package.

The submittal of the RD Package to the EPA/OEPA for review and approval is an enforceable milestone pursuant to the EPA approved RDWP. The schedule for the RD Package is summarized by the following activities in Table 1.5-50.

**TABLE 1.5-50
 REMEDIAL DESIGN PACKAGE SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101690	RD Package (Hammock)	184	--
MAJOR RD PACKAGE (COMPONENTS)			
108834	Engineering Package (Hammock)	55	10%
108926	Pre-Ops/Ops Environmental Control Plan (Hammock)	55	20%
108790	Pre-Ops Schedule (Hammock)	55	30%
108970	Pre-Ops Health and Safety Controls (Hammock)	40	40%
108842	Fluor Fernald/DOE Review Draft RD Package	20	50%
108846	Finalize Draft RD Package	20	60%
108850	Fluor Fernald/DOE Review/Accept RD Package	4	65%
108854	EPA/OEPA Review RD Package	40	75%
108858	Fluor Fernald/DOE Review EPA Comments	5	80%
108862	Develop Response to Comments/Final RD Package	15	90%
108866	Fluor Fernald/DOE Complete Response To Comments/Submit RD Package to EPA	5	-
108870	EPA/OEPA Review/Approve RD Package	20	100%

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The Draft RD Package will be reviewed in parallel by Fluor Fernald and DOE FEMP, Silos 1 and 2 team members, and the Critical Analysis Team.

5.2)2 Quantification Remedial Design Package

The overall assembly of the RD Package and coordination of its review and approval with DOE, EPA and OEPA will be performed by Silos 1 and 2 Site Engineering Team Members. Jacobs Engineering and the Silos 1 and 2 Site Engineering Team members will be responsible for preparing specific components of the RD Package in accordance with **Appendix A** of this Closure Plan. The Jacobs Engineering resources for developing the Silos 1 and 2 RD Package are included in the manpower planning for the Silos 1 and 2 Design (Charge No. HS1AC). Fluor Fernald technical support, project management, and oversight are planned under Project Management (Charge No. HS1AA). **Table 1.5-51** summarizes the ODCs for preparing the RD Package.

**TABLE 1.5-51
 RESOURCE SUMMARY FOR THE RD PACKAGE**

RESOURCE CODE	ACTIVITY NO. 101690 TOTAL RESOURCES
ODCs	
FEDEX	\$1,000

~~5.3) Subtask #3 Remedial Action Work Plan~~

~~5.3)1 Plan/Scope Remedial Action Work Plan~~

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~~Following approval of the RD Package by the EPA and OEPA, Fluor Fernald will develop a Remedial Action Work Plan (RAWP) for submittal and approval by the EPA and OEPA. The RAWP will reflect the implementation strategy and establish enforceable operational milestones for the remedial action (RA) phase of the Silos 1 and 2 Project. The enforceable milestones will be based upon the project schedule.~~

~~This regulatory submittal must be reviewed and approved by DOE-FEMP, prior to its submittal to the EPA/OEPA. Based upon past experience, it is assumed that DOE-FEMP will only require ten (10) working days to review the draft RAWP. In accordance with the Amended Consent Agreement, it is assumed that EPA and OEPA will require 60 calendar days to review and approve the RAWP. The following Table 1.5-52 summarizes the planned activities and milestones for reporting progress for this effort.~~

**TABLE 1.5-52
 RAWP SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101940	RAWP (Hammock)	170	—
101964	Fluor Fernald Prepare RAWP (Start)	0	10%
101964	Fluor Fernald Prepare RAWP (Complete)	60	35%
101968	Fluor Fernald/DOE Review RAWP	20	45%
101972	Incorporate Review Comments RAWP	10	—
101976	Submit to EPA/OEPA RAWP	—	50%
101980	EPA/OEPA Review RAWP	40	70%
101984	Fluor Fernald Revise RAWP	20	85%
101988	EPA/OEPA Approve RAWP	40	100%

~~5.3)2 Quantification Remedial Action Work Plan~~

~~The RAWP will be prepared by Fluor Fernald and Silos 1 and 2 Site Engineering Team members, and peer reviewed internally by selected Duratek Services and Fluor Fernald personnel. Fluor Fernald team members will address comments resulting from the peer review, DOE review, and EPA/OEPA review cycles and revise the document accordingly. The Jacobs Engineering resources for developing the Silos 1 and 2 RAWP are included in the manpower planning for the Silos 1 and 2 Design (Charge No. HS1AC). Fluor Fernald technical support, project management, and oversight are planned under Project Management (Charge No. HS1AA). Table 1.5-53 summarizes the ODCs for preparing the RAWP.~~

**TABLE 1.5-53
 SUMMARY RESOURCES FOR THE RAWP**

RESOURCE CODE	TOTAL RESOURCES
ODCs	
FEDEX	\$200

5.4) Subtask #4 Remedial Action Package

5.4)1 Plan/Scope Remedial Action Package

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Fluor Fernald will develop and submit principal elements of the RA documents as a single package for compliance review and approval by DOE, EPA and OEPA before authorization to operate. Elements of the RA Package will include an updated Operational Environmental Control Plan, a Sampling and Analysis Plan, a Health and Safety Plan for Remedial Action Operations, a Gross Decontamination Plan, and an O&M Plan.

The submittal of the RA Package to the EPA/OEPA for review and approval is an enforceable milestone pursuant to the EPA approved RAWP. The schedule for the RA Package is summarized by the following activities in Table 1.5-54.

**TABLE 1.5-54
 REMEDIAL ACTION PACKAGE SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101870	RA Package (Hammock)	199	--
MAJOR RA PACKAGE COMPONENTS			
109328	O&M Plan RA Facilities (Hammock)	65	10%
109240	OPs Environmental Control Plan (Hammock)	65	20%
109372	Sampling & Analysis Plan (Hammock)	65	30%
109284	O&M Health & Safety Controls (Hammock)	40	40%
109332	Fluor Fernald/DOE Review Draft RA Package	20	50%
109336	Finalize Draft RA Package	20	60%
109340	Fluor Fernald/DOE Review/Accept RA Package	4	65%
109342	Submit RA Package to EPA/OEPA	-	-
109344	EPA/OEPA Review RA Package	40	75%
109348	Fluor Fernald/DOE Review Draft RA Package Comments	5	80%
109352	Develop Response To Comments/Finalize RA Package	20	90%
109356	Fluor Fernald/DOE Complete Response To Comments/Submit Final RA Package	5	-
109360	EPA Review/Approve RTC and Final RA Package	20	100%

The Draft RA Package will be reviewed in parallel by Fluor Fernald, DOE FEMP, and Silos 1 and 2 team members.

5.4)2 Quantification Remedial Action Package

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The overall assembly of the RA Package and coordination of its review and approval with DOE, EPA and OEPA will be performed by Silos 1 and 2 Site Engineering Team members. Jacobs Engineering and the Silos 1 and 2 Site Engineering Team members will be responsible for preparing specific components of the RA Package in accordance with Appendix A of this Closure Plan. The Jacobs Engineering resources for developing the Silos 1 and 2 RA Package are included in the manpower planning for the Silos 1 and 2 Design (Charge No. HS1AC). Fluor Fernald technical support, project management, and oversight are planned under Project Management (Charge No. HS1AA). Table 1.5-55 summarizes the ODCs for preparing the RA Package.

**TABLE 1.5-55
 RESOURCE SUMMARY FOR THE RA PACKAGE**

RESOURCE CODE	ACTIVITY NO. 104870 TOTAL RESOURCES
ODCs	
FEDEX	\$1,000

5.5) Subtask #5 NTS Waste Disposal Evaluation

5.5)1 Plan/Scope NTS Waste Disposal Evaluation

NTS WAC DOE/NV 325 Rev. 3, December 2000 describes the requirements, terms, and conditions under which the NTS will accept low-level radioactive waste. Fluor Fernald Waste Certification Program Plan (WCPP), PL 3067, Rev. 5, dated 9/27/00, describes programs and processes utilized by the FEMP to ensure low-level radioactive waste shipped to the NTS conforms with all pertinent federal, state, location regulations and NTSWAC.

Once the treated wasteform for the Silos 1 and 2 material and any other secondary wastes streams destined for the NTS have been identified and characterized, a waste profile must be prepared and submitted to the DOE NV for each waste stream in accordance with FEMP Procedure No. EW 1026, Nevada Test Site Waste Profile Preparation, Rev. 1, dated 3/21/2000. The waste profile summarizes the wasteform and characterization data (physical, chemical, radiological) packaging description and appropriate project specific ALARA documentation. This documentation is prepared by the FEMP Waste Generator Services Division with input from the Silos 1 and 2 Site Engineering Team.

The waste profile approval process is then used by the DOE NV to verify that the packaged waste stream being shipped to the NTS conforms with the NTS WAC. The information is also used by the NTS to determine the proper disposal configuration of each waste stream to ensure compliance with the NTS performance assessment.

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The FEMP Waste Generator Services Division and DOE NV will be involved in the development and selection of the waste container for the treated Silos 1 and 2 material (Section 1.5.3.3 1.5.3, Task 3).

The preparation of the waste profiles for the Silos 1 and 2 waste streams are driven by the completion of two project activities: (1) NTS acceptance of the Final Container Design Package for the treated Silos 1 and 2 material (Activity No. 102276); and (2) completion of Preliminary Design (Activity No. 101673) which identifies all waste streams destined for the NTS. Table 1.5-56 provides a summary of the schedule for completing the NTS Waste Disposal Evaluation.

**TABLE 1.5-56
 SCHEDULE SUMMARY FOR THE NTS WASTE DISPOSAL EVALUATION**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
114052	NTS Waste Disposal Evaluation (Hammock)	205	--
114056	Initiate NTS Waste Disposal Evaluation (Start)	0	10%
114056	Initiate NTS Waste Disposal Evaluation (Complete)	80	30%
114060	DOE NV Review Waste Profile Information	40	60%
114064	Fluor Fernald Revise Waste Profiles	20	70%
114068	Waste Profile Resolution Meeting	5	--
114072	Finalize Waste Profiles	20	80%
114076	Fluor Fernald Bluesheet Review Final Waste Profiles	10	--
114080	DOE NV Review Final Waste Profiles	20	90%
114084	DOE NV Accept Final Waste Profiles	10	100%

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Following completion of the Nevada Test Site Waste Disposal Evaluation, Silos 1 and 2 Site Engineering will begin preparation of the Transportation and Disposal Plan (Section 1.5.3.5.7 1.5.3, Task 5, Subtask 6).

~~5.5)2 Quantification - NTS Waste Disposal Evaluation~~

The Nevada Test Site Waste Disposal Evaluation activities will be managed by the Silos 1 and 2 Site Engineering Team members. The FEMP Waste Generator Services Division will provide lead support in the development of waste profiles and coordination with the DOE-NV review and approval process. Fluor Fernald resources are planned under Project Management, Charge No. HS1AA. Table 1.5-57 provides the ODC summary for the NTS Waste Disposal Evaluation activities.

**TABLE 1.5-57
 SUMMARY RESOURCES FOR THE NEVADA TEST SITE WASTE DISPOSAL EVALUATION**

RESOURCE CODE	ACTIVITY NUMBER								TOTAL RESOURCES
	1-14056	1-14060	1-14064	1-14068	1-14072	1-14076	1-14080	1-14084	
ODCs									
FEDEX	-	\$100	-	\$100	-	\$100	\$100	-	\$400
TRAVEL (4 trips to Las Vegas @ \$2543/trip)	-	\$10,172	-	\$10,172	-	-	\$10,172	-	\$30,516
TOTAL	-	\$10,272	-	\$10,272	-	\$100	\$10,272	-	\$30,916

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~~5.6) Subtask #6 - Transportation and Disposal Plan~~

~~5.6)1 Plan/Scope - Transportation and Disposal Plan~~

The Transportation and Disposal Plan (TDP) describes how the Silos 1 and 2 Project transportation and disposal operations will be implemented to ensure safe and successful storage, staging, transportation and disposal of treated Silos 1 and 2 material from the FEMP to the NTS. The preparation and submittal of the TDP to the EPA and OEPA will be submitted separately as defined by the RDWP. The TDP serves to:

- (1) describe the staging and transportation logistics associated with the treated Silos 1 and 2 material;
- (2) generally describe operational aspects of transportation plans to demonstrate that treated Silo 1 and 2 material can be safely transported to the NTS, and in accordance with applicable regulations;
- (3) provide a transition between design and implementation of transportation operations; and
- (4) demonstrate how the treated Silos 1 and 2 material can be safely disposed at the NTS.

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The schedule for the preparation of the TDP is driven by two prior activities: (1) selection and development of the container to package the treated Silos 1 and 2 material (Section 1.5.3.3 1.5.3, Task 3), and (2) completion of the disposal configuration evaluation by the NTS (Section 1.5.3.5.6 1.5.3, Task 5).

The TDP submittal must be reviewed and approved by the DOE FEMP, prior to its submittal to the EPA and OEPA. It is assumed that DOE FEMP will only require ten (10) working days to review the draft TDP. In accordance with the Amended Consent Agreement, it is assumed that EPA and OEPA will require 60 calendar days (40 working days) to review and approve the TDP. The following Table 1.5-58 summarizes the planned activities and milestones for the reporting of progress for this effort.

**TABLE 1.5-58
 TRANSPORTATION DISPOSAL PLAN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
105000	TDP (Hammock)	124	--
105004	Fluor Fernald Prepare TDP	25	20%
105008	DOE Review/Comment TDP	10	30%
105012	Fluor Fernald Incorporate Review Comments TDP	10	40%
105016	Fluor Fernald submit to EPA/OEPA TDP	0	50%
105020	EPA/OEPA Review/Comment TDP	40	60%
105024	Incorporate EPA/OEPA Comments TDP	15	80%
105028	DOE Review/Accept TDP	5	90%
105032	Submit TDP to EPA/OEPA	0	--
105036	EPA/OEPA Review/Approve TDP	40	100%

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The EPA and OEPA approval of the TDP is a prerequisite to the preparation of an RFP to obtain the services of a qualified Transportation Vendor to ship the Silos 1 and 2 to the NTS (see Section 1.5.11.5 1.5.11, Task 4).

5.6)2 Quantification Transportation and Disposal Plan

The TDP will be prepared by Fluor Fernald and Silos 1 and 2 Site Engineering Team members, and peer reviewed by selected Duratek Services personnel. Silos 1 and 2 Site Engineering Team members will address comments resulting from the peer review, DOE review, and EPA and OEPA review cycles and revise the document accordingly. Fluor Fernald technical support, project management, and oversight resources are planned in Project Management, Charge No. HS1AA. The ODCs for developing the TDP are summarized in Table 1.5-59.

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**TABLE 1.5-59
 SUMMARY RESOURCES FOR THE TRANSPORTATION DISPOSAL PLAN**

SUMMARY OF ODCs FOR THE TRANSPORTATION DISPOSAL PLAN

RESOURCE CODE	ACTIVITY NUMBER									TOTAL RESOURCES
	105004	105008	105012	105016	105020	105024	105028	105032	105036	
ODCs										
FEDEX	-	-	\$100	-	-	-	-	\$100	-	\$200

1.5.3 HS1/AC - Engineering and Design

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The engineering and design activities for the Silos 1 and 2 Project will be managed by Fluor Fernald. Jacobs Engineering will be responsible for the detailed engineering and design for the Silos 1 and 2 Project. Fluor Fernald Site Engineers will be responsible for developing specified supporting documentation and coordinating stakeholders involvement.

The Silos Project Engineering Execution Plan (EEP) describes the integration and mechanisms for control of the Silos Project work activities between Fluor Fernald and Jacobs Engineering. The EEP is an agreement between Fluor Fernald Silos Project management and engineering staff and Jacobs Engineering management and engineering staff that establishes the planned path forward for execution of engineering and design for all Silos' Projects. The EEP describes how the engineering scope of work will be performed, who will perform it, how engineering will be controlled and reported, what and when products are to be delivered, and what procedures support quality products.

The scope, schedule and resources for the Silos 1 and 2 Engineering and Design will be managed by the following five (5) activities:

- Engineering and Design;
- Engineering Support;
- Container Design and Testing;
- Safety Basis Documentation;
- Remedial Design/Remedial Action Deliverables.

The Fluor Fernald and Jacobs Engineering resources will be managed and reported separately under the charge numbers presented in Table 1.5-24A throughout the Silos 1 and 2 Engineering and Design effort.

TABLE 1.5-24A
SUMMARY OF ENGINEERING AND DESIGN CHARGE NUMBERS

CHARGE NO.	DESCRIPTION	ORGANIZATION RESOURCE
HS1AC	Conceptual Design	Fluor Fernald
HS1AE		Jacobs Engineering
HS1AV	Preliminary Design	Fluor Fernald
HS1AW		Jacobs Engineering
HS1AX	Final Design	Fluor Fernald
HS1AY		Jacobs Engineering
HS1A1	Engineering Support of Construction, Start-up, Operations, and D&D	Fluor Fernald
HS1A2		Jacobs Engineering

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The following sections describe the scope, schedule, and planned resources for these key activities:

1) **Task #1 - Engineering and Design**

In support of the baseline procurement strategy, the engineering and design approach will facilitate preparation of multiple IFB packages or RFPs. Jacobs Engineering will prepare the deliverables identified in the EEP including drawings, specifications, cost estimates, and specified technical documentation, which become key components of the IFB/RFP Package prepared by Fluor Fernald. The IFB/RFP packages will be logically divided into the following procurement packages:

- Discrete Advanced Construction Packages;
- Electrical;
- Mechanical;
- Civil; and
- Container (prepared by Duratek).

During the preliminary design, Jacobs Engineering and Fluor Fernald will identify the need to initiate long lead procurement activities and advanced construction packages for specific pieces of equipment, systems, and structures. Considerations for long lead procurement will include: items whose vendor-specific design could impact the project's safety basis or final design of the remediation and/or support facilities; any items whose early procurement can mitigate project schedule risk; and any expensive items whose early procurement can help balance site fiscal funding. Similarly, consideration for advanced construction packages will include non-safety significant items, which can be constructed in advance to reduce the construction schedule risk and help balance site fiscal funding.

The scope, schedule, and resources for the engineering and design effort for the Silos 1 and 2 Project will be planned, managed, and reported under the following Hammock Activities:

- 5) Design Basis Package;
- 6) Conceptual Design Package;
- 7) Preliminary Design Package; and
- 8) Final Design Package;

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These hammock activities summarize the logical development of the Silos 1 and 2 Engineering and Design effort. The transition between stages will be seamless, based upon close working relationships of the integrated design team.

1.1) Subtask #1 - Design Basis Package

1.1)1 Plan/Scope - Design Basis Package

Fluor Fernald Silos 1 and 2 Site Engineering will prepare a "Design Basis Package" which will serve as the basis for the Conceptual Design Package, Preliminary Design Package, Final Design Package prepared by Jacobs Engineering and Container Design activities performed by Duratek Services for the Silos 1 and 2 Project. The purpose of the Design Basis Package is to facilitate the development of the technical baseline for the engineering and design concept(s) and to establish the appropriate integration of safety, technical, and regulatory requirements into the design. The scope of the Design Basis Package includes the following key documentation:

- List of Project Deliverables and Definitions;
- Design Basis and Assumptions;
- Functional and Technical Requirements;
- Conceptual Design Information; and
- Project Schedule/Budget.

The Design Basis Package will take advantage of previous technical efforts undertaken in support of the Silos 1 and 2 Project. The Design Basis Package includes pertinent functional requirements, administrative, technical, safety, and regulatory requirements, design criteria and related conceptual design information extracted from the following Silos 1 and 2 documents:

- Revised Silos 1 and 2 Feasibility Study, Appendix G;
- Draft Silos 1 and 2 RFP, Part 7, Technical Requirements Document; and
- Draft Silos 1 and 2 RFP, Part 8, Environmental, Health, and Safety Requirements Document.

A peer review of this information will be performed to ensure the "Design Basis Package" provided to Jacobs Engineering reflects the current path forward for the remediation of the Silos 1 and 2. The peer review will also ensure the information includes only those essential requirements and criteria necessary for remediation to be performed in a safe contractual and regulatory compliant manner.

The Design Basis Package is represented by Activity Number 101615, "Design Basis Package", having 63 days of duration. The Fluor Fernald Silos 1 and 2 Site Engineering Team will conduct a one-day "transition meeting" with Jacobs Engineering upon completion of the Design Basis Package.

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1.1)2. Quantification - Design Basis Package

Table 1.5-25 summarizes the resources for the preparation of the "Design Basis Package."

TABLE 1.5-25
 DESIGN BASIS PACKAGE RESOURCE SUMMARY

RESOURCE CODE	ACTIVITY NO. 101615		
	JAN	FEB	MAR
Labor (FTEs)			
ENGCVL	0.2	0.2	0.2
ENGINR	1.0	1.0	1.0
ENGINR	0.5	0.5	0.5
ENGPRC	0.5	0.5	0.5
TPSREP	0.5	0.5	0.5
ODC's			
Travel (5) 3-Day Trips @ \$855/trip		\$4,275	

1.2) Subtask #2 - Conceptual Design Package

1.2)1. Plan/Scope - Conceptual Design Package

Jacobs Engineering will develop the information and documentation necessary for completion of the Conceptual Design phase of the Silos 1 and 2 Project. Jacobs Engineering will prepare the Conceptual Design Package which establishes the project's technical baseline and meets the intent of the following FEMP Procedures:

- ED-12-4001, Functional Requirements;
- ED-12-4002, Conceptual Design Report;
- ED-12-4003, Design Criteria Package; and
- ED-12-4004, Design Package.

Selected Silos 1 and 2 Site Engineering team members will assist Jacobs Engineering throughout the development and preparation of the Conceptual Design Package and participate in over-the-shoulder reviews to expedite the preparation of the required documentation. Silos 1 and 2 Safety Analysis team members will closely interface with Jacobs Engineering throughout the development of the Conceptual Design Package to ensure consistency, continuity, and completeness with the emerging Safety Basis Documentation and the engineering and design documentation.

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The schedule for the Conceptual Design Package is summarized by the Activity Hammock No. 101666 entitled, "Conceptual Design Package," having a total of 252 days of duration.

1.2.2 Quantification - Conceptual Design Package

The planned resources for the Silos 1 and 2 Conceptual Design Package are summarized in Table 1.5-26. Project management and oversight labor is planned under Project Management (Charge No. HS1AA). The Fluor Fernald engineering resources will be managed under Charge No. HS1AC. The Jacobs Engineering resources will be managed under Charge NO. HS1AE. Jacobs Engineering manhours are summarized from a staffing plan developed from their knowledge of the project schedule and design deliverables.

TABLE 1-5-26
CONCEPTUAL DESIGN PACKAGE RESOURCE SUMMARY

RESOURCE CODE	CONCEPTUAL DESIGN PACKAGE ACTIVITY NO. 101666 AND 201666											
	APR 01	MAY 01	JUN 01	JUL 01	AUG 01	SEP 01	OCT 01	NOV 01	DEC 01	JAN 02	FEB 02	MAR 02
Fluor Fernald Labor (FTEs) - HS/AC												
ENGCVE	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
ENGINR	1	1	1	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3
ENGINR	-	-	-	-	-	-	-	-	-	-	-	0.2
ENGINB	-	-	-	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-
ENGINR	1	1	1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
ENGRRC	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
TPSREP	0.5	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.4	0.4	0.4
WSTENG	-	-	-	-	-	-	1.0	1.0	1.0	1.0	1.0	1.0
WSTMGR	-	-	-	-	-	-	0.5	0.5	0.5	0.5	0.5	0.5
Duratek (TPHO)	1.1	1.1	1.1	1.1	-	-	-	-	-	-	-	-
Duratek (TPHO)	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-
Duratek (TPHO)	0.05	0.05	0.05	0.05	-	-	-	-	-	-	-	-
Fluor Fernald ODCs												
TRAVEL TO OAK RIDGE (5) 3-day trips per month @ \$855/trip	\$4275	\$4275	\$4275	\$4275	\$4275	\$4275	\$4275	-	-	-	-	-
Critical Analysis Team	-	-	-	-	\$6000	-	-	-	-	-	-	-
Jacobs Engineering Labor (Manhours) - HS/IAE												
Jacobs Engineering Home Office Teaming Partner	3,100	3,100	3,100	3,100	1,400	1,400	1,400	1,400	1,400	1,400	1,397	-
Jacobs Engineering ODCs												
TRAVEL, REPRODUCTION, ETC.	\$8600	\$8600	\$8600	\$8600	\$5000	\$4850	\$4850	\$4850	\$4850	\$4850	\$4850	-

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1.3) Subtask #3 - Preliminary Design Package

1.3.1) Plan/Scope - Preliminary Design Package

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The Preliminary Design Package will be prepared and verified by Jacobs Engineering consistent with the requirements of FEMP Procedure No. ED-12-4004, Design Package. The Preliminary Design Package will demonstrate the appropriate integration of requirements and criteria into the design. The scope of the Preliminary Design Package will include all systems identified in the Design Basis Package, as well as all support systems required by the Jacobs Engineering design concept. Any changes to the Silos 1 and 2 design and safety basis documentation would be required to be made in accordance with configuration and change control procedures identified in the EEP.

Selected Silos 1 and 2 Site Engineering team members will assist Jacobs Engineering throughout the development and preparation of the Preliminary Design Package and will participate in "over the shoulder" reviews to expedite the preparation of the required documentation. Fluor Fernald Safety Analysis team members will closely interface with Jacobs Engineering throughout the development of the Preliminary Design Package to ensure consistency, continuity, and completeness with the Safety Basis Documentation [Section 1.5.3, Task 4]. The Silos 1 and 2 Site Engineering team will involve all appropriate groups (i.e., construction, operations, etc.) in the review of the design package to verify the Preliminary Design Package satisfies the requirements of FEMP Procedure Number, ED-12-4010, Design Verification. The entire Preliminary Design Package will be issued by the Silos 1 and 2 Project Team as a formal submittal for internal review. DOE will formally review the design package.

Individual components and documents supporting the Preliminary Design Package may be submitted as they become available to expedite the review process and to allow comments to be resolved and incorporated into follow-on revisions. Each document will be issued as a unique record through the FEMP ECDC and be revised accordingly from its previous submittal according to the Records Management Program (to include Configuration Management).

Specific components of the Preliminary Design Package will be extracted and combined with other project related documents and submitted to the EPA/OEPA under the Remedial Design Package for review and approval [Section 1.5.3, Task 5, Subtask 2].

In support of the Jacobs design effort of the treatment facility, the Silos 1 and 2 Site Engineering Team will be responsible for obtaining an estimated fourteen (14) geotechnical samples and analysis and a topographical survey of the project area. There will be eight (8) soil borings located within the boundaries of the footprint for the Silos 1 and 2 remediation facilities. The remaining six (6) soil borings will be located within the boundaries of the new Silos Trailer Staging Area. The soil borings will be provided through a new services contract and the geotechnical analysis of the soil borings and summary report will be obtained through the amendment of an existing FEMP subcontract with ATEC, Inc. Based upon past experience, the cost of the soil borings, geotechnical analysis and summary report have been planned at \$100,000 and the topographical survey is planned at \$35,000.

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1.3.2 Quantification - Preliminary Design Package

The schedule for the Preliminary Design Package is summarized by the Activity Hammock No. 101670, entitled, "Preliminary Design Package," having a total of 269 days of duration. The planned resources for the Silos 1 and 2 Preliminary Design Package are summarized in the following Table 1.5-27. The Jacobs Engineering manhours are summarized from a staffing plan developed from their knowledge of the project schedule and design deliverables. Project management and oversight labor is planned under Charge No. HS1AA. The Fluor Fernald engineering resources will be managed under Charge No. HS1AV. The Jacobs Engineering resources will be managed under Charge No. HS1AW.

TABLE 1.5-27
 PRELIMINARY DESIGN PACKAGE RESOURCE SUMMARY

RESOURCE CODE	AUG 01	SEP 01	OCT 01	NOV 01	DEC 01	JAN 02	FEB 02	MAR 02	APR 02	MAY 02	JUN 02	JUL 02	AUG 02
PRELIMINARY DESIGN PACKAGE - ACTIVITY NO. 101670 AND 201670													
Fluor Fernald Labor (FTEs) HS1AV													
ENGCVL			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ENGINR			0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
ENGINR						0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ENGINR						0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
ENGINR	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.3	0.3
ENGPRC	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.5	0.5	0.5	0.3	0.3
TFSRFR	0.2	0.2	0.2	0.2	0.2	0.6	0.6	0.6	0.8	0.8	0.8	0.5	0.5
WSTENG										1	1	1	1
WSTMGE									0.5	0.5	0.5	0.5	0.5
Duratek (TPHO)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Duratek (TPHO)	0.05	0.05	0.05										
Duratek (TPHO)													
Fluor Fernald ODCs													
GEOTECH SUBCONTRACT		\$100,000											
TOPOGRAPHICAL SURVEY		\$35,000											
TRAVEL TO OAK RIDGE	\$4,275 Each Month (5) 3-Day Trips @ \$855/trip Through April 2002												
Jacobs Engineering Labor (Manhours) HS1AW													
Jacobs Engineering TPHO	5,200	5,200	5,200	5,200	5,200	5,200	5,200	4,944	2,000	2,000	2,000	2,000	2,000
Jacobs Engineering ODCs (\$) :													

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TRAVEL, REPRO, ETC.	6750	6750	6750	6750	6750	6750	6750	6750	2000	2000	2000	2000	2000
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1.4) Subtask #4 - Final Design Package

1.4.1) Plan/Scope - Final Design Package

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The Final Design Package will be prepared and verified by Jacobs Engineering consistent with the requirements of FEMP Procedure No. ED-12-4004, "Design Package." The documentation, which comprises the Final Design Package, including the expected level of detail of the components.

The Final Design Package will demonstrate the appropriate integration of requirements and criteria into the design, and once approved, will include certified for construction (CFC) drawings and specifications for the IFB/RFP Packages.

Selected Silos 1 and 2 Site Engineering team members will assist Jacobs Engineering throughout the development and preparation of the Final Design Package and will participate in "over the shoulder" reviews to expedite the preparation of the required documentation. Fluor Fernald Safety Analysis Team members will closely interface with Jacobs Engineering throughout the development of the Final Design to ensure consistency, continuity, and completeness with the Safety Basis Documentation [Section 1.5.3, Task 4)]. The Silos 1 and 2 Site Engineering Team will involve all appropriate groups (i.e., construction, operations, etc.) in the review of the design package, so that the verification of the Final Design Package will satisfy the requirements of FEMP Procedure Number, ED-12-4010, Design Verification. The entire Final Design Package will be issued by the Silos 1 and 2 Project Team as a formal submittal for internal review. DOE-FEMP will be involved in the review of the document pursuant with the EEP.

Individual components and documents supporting the Final Design Package may be submitted, as they become available to expedite the final review process and to allow comments to be resolved into follow-on revisions. Each document will be issued as a unique record through the FEMP ECDC and be revised accordingly from its previous submittal according to the Records Management Program (to include Configuration Management).

1.4.2) Quantification - Final Design Package

The schedule for the Final Design Package is summarized by the Activity Hammock No. 101720, Final Design Package, having a total of 270 days of duration.

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Table 1.5-28 summarizes the resources for the preparation of the Silos 1 and 2 Final Design Package. Project management and oversight labor is planned under Project Management Charge No. HS1AA. The Fluor Fernald engineering resources will be managed under Charge No. HS1AX. The Jacobs Engineering resources will be managed under Charge No. HS1AY. The Jacobs Engineering manhours are summarized from a staffing plan developed from their knowledge of the project schedule and design deliverables.

TABLE 1.5-28
FINAL DESIGN PACKAGE RESOURCE SUMMARY

FINAL DESIGN PACKAGE - ACTIVITY NO. 101720 AND 201720													
RESOURCE CODE	APR 02	MAY 02	JUN 02	JUL 02	AUG 02	SEP 02	OCT 02	NOV 02	DEC 02	JAN 03	FEB 03	MAR 03	APR 03
Fluor Fernald Labor (FTEs) - HS1AX													
ENGCVL	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1
ENGINR	0.5	0.5	0.5	0.5	0.5	0.5	0.9	0.9	0.9	1	1	1	0.5
ENGINR	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.2
ENGINR	1	1	1	1	1	1	1.4	1.4	1.4	1.4	1.4	1.4	1.4
ENGINR	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.7	0.7	1	1	1	1
ENGPRC	0.2	0.2	0.2	0.4	0.4	0.4	0.7	0.7	0.7	1	1	1	0.5
TPSRER	0.2	0.2	0.2	0.5	0.5	0.5	1	1	1	1	1	1	0.5
WSTENG	1	1	1	1	1	1	1	1	1	1	1	1	1
WSTMGR	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Duratek (TPHO)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Duratek (TPHO)	1	1	1	1	1	1	1	1	1	1	1	1	1
Fluor Fernald ODCs													
TRAVEL TO OAK RIDGE	\$4,275 Each Month 151 3-Day Trips @ \$855/trip												
Jacobs Engineering Labor (Manhours) - HS1AY													
Jacobs Engineering (TPHO)	6,351	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250
Jacobs Engineering ODCs (\$)													
TRAVEL, REPRO, ETC.	10,900	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800

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2) Task #2 - Engineering Support of Construction, Start-up, Operations, and D&D

2.1) Plan/Scope - Engineering Support of Construction, Start-up, Operations, and D&D

Technical

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Fluor Fernald and Jacobs Engineering will jointly perform engineering support responsibilities through construction, start-up, operations, and D&D. Silos 1 and 2 Site Engineering will provide a project engineer for each construction contract (i.e., civil, electrical, mechanical) throughout construction, SOT, start-up, and D&D activities. This individual will serve as a point of contact for resolving engineering and design issues, which effect the CFC design package, construction and startup of remediation facilities. The Silos 1 and 2 Site Engineering Team and Jacobs Engineering home office support will be used as required to resolve technical issues (i.e., DCNs, requests for clarification or information, etc.) relating to the CFC Design Packages, home office review of vendor submittals, field inspection during construction, support of CAT, and startup and operation of the remediation facilities.

Procurement Services

Jacobs Engineering will provide support to the Fluor Fernald Silos 1 and 2 Site Engineering Team at various points during the Silos 1 and 2 long-lead procurement activities (i.e., review of vendor submittals, inspection during fabrication, inspection at delivery). Duratek Services will also provide technical support to the Source Evaluation Board's (SEB) evaluation of proposals for manufacturing the disposal container for the treated Silos 1 and 2 material.

CADD

Jacobs Engineering will provide computer aided drafting and design (CADD) services throughout the entire Silos 1 and 2 Project. Jacobs Engineering will be responsible for receiving all "redline" drawings, incorporating design change notices, and maintaining a set of current as-built drawings throughout construction and SOT activities.

Jacobs Engineering will interface with the Fluor Fernald Silos 1 and 2 Site Engineering Team to ensure that all "redline" drawing information pertaining to FEMP infrastructure drawings are forwarded in a timely manner and incorporated by FEMP Engineering Services CADD personnel.

Inspections, Surveillances, and Audits

Fluor Fernald will be responsible for all inspections, surveillances and audits throughout this project. A graded approach to assessments, inspections, and testing will be used to ensure that resources applied are commensurate with the performance grade or hazard category assigned to the system, structure, or component.

Prior to the completion of the Preliminary Design Package a schedule of inspections and acceptance tests will be developed and maintained in order to ascertain that specified items are correct and acceptable for use.

Design Change Notices

Based on past project experience, it is assumed that eight (8) DCNs will be processed per month throughout the construction, CAT, and SOT phases. Any DCNs, which revise EPA-approved documents, must be submitted to the EPA for review and approval.

Design Closeout Report

A Design Closeout Report will be prepared by Jacobs Engineering and submitted at the end of start-up testing. At a minimum the package will include a general project/scope of work description, lessons learned from design disciplines, as-built copies of all drawings, a finalized equipment list, O&M manuals for all equipment, completed system design descriptions, and deviation/change order "hold" items.

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The Jacobs Engineering support for the Silos 1 and 2 Project is represented by the Hammock Activity Number 101748, "Jacobs Support of Construction, Start-up, Operations, and D&D." This activity is logically tied to start at the completion of Fluor Fernald Acceptance of the Final Design (Activity Number 101732) and the beginning of the preparation of the Civil IFB packages (Activity Number 121010). The duration of this task is 1,168 days. Progress on this activity will be apportioned in relation to the progress of the IFB Procurement Processes, and construction, CAT, start-up, operations, and D&D activities.

2.2) Quantification - Engineering Support of Construction, Start-up, Operations, and D&D

The aggressive construction, startup, and operations schedule requires that the Silos 1 and 2 Project Team be adequately staffed to provide engineering support III services. Resources estimated for Fluor Fernald Silos 1 and 2 Engineering Services Support were developed from recent project experience at the FEMP site. For labor planning purposes, it is assumed that there will be 200 drawings in the Final Design Package, which will need to be maintained throughout the life of the project. It is estimated that it will take an average of 20 manhours/drawing for incorporating all "redlines" into the as-built drawing packages. In addition to redlines, it is assumed that Jacobs Engineering support will be necessary to process an estimated 8 DCN's per month throughout the duration of the construction, CAT, and SOT phases, requiring a total of 60 manhours (Jacobs Engineering)/DCN. This includes 40 manhours of engineering discipline labor support and 20 manhours of CADD labor support per DCN.

It is planned that Fluor Fernald CADD Engineering Services will only be required to incorporate all pertinent redline information into the FEMP infrastructure drawings.

For labor planning purposes, it is assumed that the FEMP site infrastructure drawings identified in Table 1.5-29 will be required to be updated to reflect Silos 1 and 2 as-built conditions.

TABLE 1.5-29
SUMMARY OF FEMP SITE INTERFACE DRAWINGS
REQUIRING AS-BUILT MODIFICATIONS

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Quantity	Drawing
2	Fire Protection
2	Stormwater Drainage
2	Electrical/Power
2	Mechanical
2	Communications/Data
2	Piping
2	General Arrangements
20	RCS (AWR)
36	Total Drawings

It is assumed that it will require 20 manhours/drawing to incorporate all "redline" information into the FEMP infrastructure drawings.

Table 1.5-30 provides a summary of the Fluor Fernald and Jacobs Engineering resources for Title III Services. Project management and oversight labor is planned under Project Management Charge No. HS1AA. The Fluor Fernald engineering resources will be managed under Charge No. HS1A1. The Jacobs Engineering resources will be managed under Charge No. HS1A2.

**TABLE 1.5-30
 SUMMARY OF ENGINEERING SUPPORT OF CONSTRUCTION,
 START -UP, OPERATION, AND D&D**

RESOURCE CODE	FY-03				FY-04				FY-05				FY-06				FY-07				FY-08			
	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER	QUARTER		
	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Fluor Fernald Labor (FTEs) - HS1A1 (Activity No. 101750)																								
DRTCAD	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	
ENGCVL	0.1	0.2	0.2	0.7	0.7	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENGINR	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
ENGINR	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	
ENGINR	1.0	1.4	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENGPCR	0.5	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TPSREP	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
WSTMGR	0.5	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Fluor Fernald ODCs																								
Travel	6 Trips per quarter to vendors @ \$1,200 per trip through FY06-3Q (\$7,200 per quarter)																							
Jacobs Engineering Labor (FTEs) - HS1A2 (Activity No. 101748)																								
Jacobs Engineering	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Jacobs Engineering ODCs																								
Travel	6 Trips per quarter Oak Ridge to Cincinnati @ \$855 per trip through FY06-3Q (\$5,130 per quarter)																							

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3) Task #3 - Container Design and Testing

The major concern associated with the treatment and disposal of the Silos 1 and 2 material is the radiological exposure to the remediation workers. The gamma dose associated with the daughter products of radium-226 in the Silos 1 and 2 material requires that the process facility (i.e., transfer lines, equipment) and waste packaging provide adequate shielding to ensure that worker exposure is maintained ALARA.

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Based upon previous engineering studies, containers that can be economically used to dispose the treated Silos 1 and 2 material in accordance with the specified requirements may not be commercially available. However, it is assumed that an existing container design can be modified to provide an optimal packaging solution for the treated Silos 1 and 2 material. Once an acceptable container design has been tested and certified, it is assumed that fixed-price turnkey contractor(s) will be procured to design, test, certify, manufacture, and deliver the specified container.

The design basis for the Silos 1 and 2 disposal container is addressed as a component of the engineering and design effort under Activity No. 101615, Silos 1 and 2 Design Basis Package. The Design Basis Package will be prepared by the project team and will identify all the performance requirements, specific criteria, and assumptions for the design of the container.

The schedule for all the Container Design and Testing activities is summarized under the Activity Hammock No. 101300. The resources will be managed and reported under Charge No. HSTAC. The following sections describe how the scope, schedule, and resources of the Container Design will be managed and reported under the following six (6) key activities:

- 7) Container Analysis and Survey Report
- 8) Preliminary Container Design Package
- 9) Final Container Design Package
- 10) Container Test Plan
- 11) Container Fabrication and Testing, and
- 12) Container Test Report

The certified design and specifications for the container developed under this effort will be used as a basis for the procurement of supplier(s) to provide containers for the Silos 1 and 2 treatment operations.

3.1) Subtask #1 - Container Analysis and Survey Report

3.1.1) Plan/Scope - Container Analysis and Survey Report

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Based on the radiological characteristics of the Silos 1 and 2 material and modeling over a waste loading range of 15 to 40 wt%, the treated wasteform is anticipated to have a direct radiation field upon contact between 130 and 340 mrem/hour. The cumulative worker exposure associated with the processing and handling of thousands of containers of treated Silos 1 and 2 material could be significant. The selected container design must be developed in accordance with ALARA principles. Therefore, an analysis of commercially available packaging, processing options, container shielding options and transport configurations over the anticipated waste loading range of 15-40 wt% needs to be evaluated with ALARA principles to determine whether the development of a customized package is warranted.

Preferably, a commercially available container can be identified for the waste loading range that is optimized with respect to the following factors:

- To balance the capital cost of the treatment process with the cost of waste disposal;
- To maximize payload to minimize the number of containers and shipments that would be required to transport the material to NTS;
- To provide the necessary shielding to meet the DOT radiation level requirements for transporting radioactive material without requiring additional shielding on the conveyance (if feasible);
- To minimize contact dose to workers associated with shipment preparation; and
- To provide a seal that prevents radon emanation.

A survey report will be prepared which summarizes the commercially available containers, the scenarios considered, and the rough-order-of-magnitude cost for the most promising scenarios. This report will be used as the basis for proceeding with the development of a container and conceptual process design for the treated Silos 1 and 2 material.

The schedule for the container analysis and survey report is summarized under Activity Number 101801. The activity is a 50/100% milestone and has a duration of 60 workdays. This activity and the preparation of the Design Basis Package are logically tied and will be performed in parallel. The activity will finish before the Design Basis Package is complete so that the results can be incorporated into the final Design Basis Package provided to Jacobs Engineering.

3.1)2. Quantification – Container Analysis and Survey Report

Silos 1 and 2 Site Engineering personnel will consolidate and forward applicable background information to Duratek personnel, who have been matrixed to perform this task. Silos 1 and 2 Site Engineering personnel are planned under Project Management, Charge No. HS1AA. Duratek (TPHO) is estimated to provide 360 manhours through their home office for this task under Charge No. HSTAC.

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3.2) Subtask #2 – Preliminary Container Design Package

3.2)1. Plan/Scope – Preliminary Container Design Package

The Duratek teaming partners will be used to develop a Preliminary Container Design Package. The Preliminary Container Design Package will be peer reviewed by Duratek, Fluor Fernald (including the Technical Review Board (TRB) and the Independent Safety Review Committee (ISRC), DOE-FEMP, and the DOE-Nevada Operations Office (DOE-NV)) prior to finalization of the container design.

The Preliminary Container Design Package will be developed and submitted prior to fabrication and testing of containers. The Preliminary Container Design Package will include the Container Analysis and Survey Report, Container Design Specifications, container drawings (including – bills of materials, assembly, and details), shielding calculations, ALARA analysis and a NTS and DOT Requirements compliance analysis. The Preliminary Container Design Package will also provide demonstrated compatibility of the treated wasteform with the container's materials of construction, control of radon emissions for the package, and the integration of the Container Design Package with the applicable systems within the full-scale facility design and Safety Basis Documentation.

Table 1.5-31 summarizes the schedule for developing the Preliminary Container Design Package. All activities are assumed to have "finish-to-start" relationships. Progress on this activity will be reported in accordance with the 20%, 70%, 80%, and 100% milestones associated within the completion of the respective activities.

TABLE 1.5-31
SCHEDULE SUMMARY, PRELIMINARY CONTAINER DESIGN PACKAGE

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101850	Preliminary Container Design Package (Hammock)	128	
101804	Prepare Preliminary Container Design Package (Start)	0	20%
101804	Prepare Preliminary Container Design Package (Complete)	81	70%
101808	Fluor-Fernald/DOE Review Preliminary Design Package Containers	27	80%
101812	Incorporate Comments into Preliminary Container Design Package	20	100%

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3.2)2. Quantification - Preliminary Container Design Package

Table 1.5-32 summarizes the resources for completing the Preliminary Container Design Package activities. These resources are planned under Charge No. HS1AC.

TABLE 1.5-32
SUMMARY OF RESOURCES FOR THE PRELIMINARY CONTAINER DESIGN PACKAGE

RESOURCE CODES	ACTIVITY NO. 101850 TOTAL RESOURCES
Labor (FTEs)	
DURATEK (TPHO)	4
ODCs	
Travel (NTS) 8 man trips (3 days)	\$12,000
Federal Express	\$100
Subtotal ODCs	\$12,100

It is assumed that (4) FTEs of Duratek Engineering and CADD support will be involved in the preparation of the container design documentation. Silos 1 and 2 Site Engineering Team members will provide over the shoulder review and coordinate review of the design package with FEMP Organizations (e.g., Waste Generator Services, Waste Acceptance Organization, ISRC, TRB, etc.). Fluor-Fernald support management and oversight labor is planned in Project Management, Charge No. HS1AA. In addition, DOE-NV representatives will be involved in the development of the container design to ensure compliance with the NTS WAC. Several trips to meet with DOE-NV representatives have been planned to discuss the container concept and solicit container design input.

3.3) Subtask #3 - Final Container Design Package

3.3.1) Plan/Scope - Final Container Design Package

Based upon resolution of comments on the Preliminary Container Design Package, the Duratek team shall prepare a Final Container Design Package. The Final Container Design Package will be reviewed and approved by Duratek, Fluor Fernald, and the NTS prior to construction and testing of the prototype containers.

The Final Container Design Package would include the most recent revisions of all the documentation submitted in the Preliminary Container Design Package based upon comment resolution and documentation by Fluor Fernald and Duratek. The package would also include specified documentation supporting Fluor Fernald's performance grading of the container and safety basis documentation specific to the container and the container handling and storage design of the remediation facility. This includes the manufacturer's specifications and procedures for container fabrication, handling, loading, and lid fastening and identify all QA testing and inspections. Fluor Fernald will coordinate the preparation and closure of comment resolutions on the Final Container Design Package with the FEMP organizations. Duratek will not initiate prototype container fabrication until it receives Fluor Fernald approval of the Final Container Design Package.

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Table 1-5-33 summarizes the schedule for developing the Final Container Design Package. All activities are assumed to have "finish-to-start" relationships.

**TABLE 1-5-33
 FINAL CONTAINER DESIGN PACKAGE SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101860	Final Container Design Package (Hammock)	76	█
101816	Prepare Final Container Design Package	20	60%
101820	Prepare Test Plan	20	█
101828	Fluor Fernald/DOE Review Final Container Design Package	31	75%
101832	Incorporate Comments into Final Container Design Package	20	95%
101836	Fluor Fernald Acceptance Final Container Design Package	5	100%

During Fluor Fernald's review of the Final Container Design Package, Activity No. 101828, the Silos 1 and 2 Site Engineering team will be coordinating the parallel reviews by the ISRC, TRB, DOE-FEMP, and the DOE-NV organizations.

3.3)2 Quantification - Final Container Design Package

Table 1.5-34 summarizes the Duratek resources for completing the Final Container Design Package activities. These resources are planned under Charge No. HS1AC.

TABLE 1.5-34
 FINAL CONTAINER DESIGN PACKAGE RESOURCE SUMMARY

RESOURCE CODES	ACTIVITY NO. 101860 TOTAL RESOURCES
Labor (FTEs)	
DURATEK (TPHO)	4
ODCs	
Travel (NTS) 4 man trips	\$8,000
Subtotal ODCs	\$8,000

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It is assumed that (4) FTEs of Duratek Engineering and CADD support will be involved in the preparation of the container design documentation. Silos 1 and 2 Site Engineering Team members will provide over the shoulder review and coordinate review of the design package with FEMP Organizations (e.g., Waste Generator Services, Waste Acceptance Organization, ISRC, TRB, etc.). Fluor Fernald support management and oversight labor is planned in Project Management, Charge No. HS1AA. In addition, DOE-NV representatives will be involved in the development of the container design to ensure compliance with the NTS WAC. Several trips to meet with DOE-NV representatives have been planned to finalize the container concept and solicit container design input.

3.4) Subtask #4 - Container Test Plan

3.4)1 Plan/Scope - Container Test Plan

The Duratek Engineering Services personnel will prepare and submit a Container Test Plan and test schedule to Fluor Fernald for review and concurrence. The Container Test Plan will identify all the required destructive and non-destructive tests and describe the procedure by which the container test subcontractor will independently certify that the container meets all the technical and performance requirements. The test plan will include test objectives, design and certification test procedures, test equipment and materials, sampling data collection and analysis plan, data management, data analysis and evaluations, QA/QC, progress reporting, test schedule, management and staffing, and a certification plan.

It is assumed that the Duratek Engineering Services will prepare the Container Test Plan in parallel with the preparation of the Final Container Design Package.

The container subcontractor shall not perform container testing until it receives Fluor Fernald concurrence on the Container Test Plan.

3.4)2. Quantification - Container Test Plan

It is assumed that Duratek Engineering Services will submit the Test Plan for Fluor Fernald review together with the Final Container Design Package submittal. Therefore, the Duratek resources for preparing, reviewing, and commenting on the Test Plan have been included in the resource planning for preparation and review of the Final Container Design Package (Table 1.5-34).

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3.5) Subtask #5 - Prototype Container Fabrication and Testing

3.5)1. Plan/Scope - Prototype Container Fabrication and Testing

Prototype container fabrication and testing would be conducted in accordance with the approved Final Container Design Package and the Container Test Plan to ensure that containers meet or exceed the design specifications required by the DOT, the NTS WAC, and the FEMP site requirements. It is assumed that the prototype container fabrication and testing will be conducted off-site at the subcontractor's facilities. Duratek will be required to have independent testing by a qualified vendor to verify containers meet testing requirements (vendor to be approved by Fluor Fernald). Fluor Fernald Site Engineering and QA personnel may be present during the manufacturer's fabrication and testing of the container subcontractor's shipping containers. In addition, Fluor Fernald personnel may perform periodic inspections of the container subcontractor's or lower-tier subcontractor's container manufacturing and testing facilities.

Table 1.5-35 summarizes the schedule for the fabrication and the testing of the containers.

**TABLE 1.5-35
 CONTAINER FABRICATION AND TESTING SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101840	Testing Containers (HAMMOCK)	80	1
101844	Materials Testing	40	50%
101904	Container Fabrication	20	75%
101908	Test Prototype Containers	20	100%

It is assumed that the container fabrication and testing activities will not begin until the Final Container Design Package and Container Test Plan are approved.

At the completion of testing, the container subcontractor will provide several prototype containers to Fluor Fernald to support the development of training documentation and worker material handling experience.

3.5)2 Quantification - Prototype Container Fabrication and Testing

Table 1.5-36 summarizes the resources for completing the container fabrication and testing activities. These resources are planned under Charge No. HS1AC. The resources for project management and oversight of these containers are planned under Charge No. HS1AA.

**TABLE 1.5-36
 CONTAINER FABRICATION AND TESTING RESOURCE SUMMARY**

RESOURCE CODE	ACTIVITY NO. 101840 TOTAL RESOURCES
Labor (FTEs)	
Duratek (TPHO)	4
ODCs	
Container Subcontractor	\$140,000
Prototype Container Cost	\$49,200
Preparation Test	\$20,000
Transportation Cost	\$10,350
Testing Services	\$81,000
Subtotal Testing	\$300,500
Travel	\$20,000
Subtotal ODCs	\$320,500

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3.6) Subtask #6 - Container Test Report

3.6)1 Plan/Scope - Container Test Report

Duratek Engineering Services will prepare and submit a Container Test Report to Fluor Fernald for review and concurrence. The test report will include test descriptions, test results, conclusion, final container test plan, pre-test inspections, test data sheets, test exceptions, test equipment, calibration, documentation, photographs, and container certification.

Table 1.5-37 summarizes the schedule for developing the Container Test Report. It is assumed Duratek's preparation of the Container Test Report will begin before the container testing activities are complete. However, only 25 workdays would be on the critical path schedule.

TABLE 1-5-37
CONTAINER TEST REPORT SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
102100	Container Test Report (Hammock)	90	
102104	Prepare Container Test Report (Start)	0	20%
102104	Prepare Container Test Report (Complete)	65	70%
102108	Fluor Fernald Review Container Test Report	10	80%
102112	Incorporate Review Comments into Container Test Report	10	90%
102116	Fluor Fernald Accepts Container Test Report	5	100%

3.6)2 Quantification - Container Test Report

Table 1-5-38 summarizes the resources for completing the Container Test Report activities. These resources are planned under Charge No. HS1AC. The project management and oversight resources are planned under Charge No. HS1AA.

TABLE 1-5-38
CONTAINER TEST REPORT RESOURCE SUMMARY

RESOURCE CODE	ACTIVITY NO. 102100 TOTAL RESOURCES
Labor (FTEs)	
Duratek (TPH0)	2
ODCs	
Travel (\$2,000 per trip)	\$2,000
Subtotal ODCs	\$2,000

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4) Task #4 - Safety Basis

The project Safety Basis is defined as the combination of information relating to the control of hazards at a nuclear facility (including design, engineering analysis, and administrative controls) upon which the DOE bases its conclusion that the activities at the facility can be conducted safely. The Silos 1 and 2 Project activities will be categorized by its hazards severity following the criteria set forth in DOE-EM-STD-5502-94. This hazard categorization dictates the documentation required for assessing the hazards associated with the planned activities and establishing the Authorization Basis for performing the activities. The Safety Basis will be critically linked to the design, construction, and operation of the Silos 1 and 2 remediation facility.

The Hazard Category (HC) is also used to establish the level of effort for other Fluor Fernald programs such as Performance Grading, ORR, Conduct of Operations (CONOPS), and Price Anderson Amendment Act (PAAA) QA reporting. Safety analyses using a graded approach per DOE technical standards are the mechanisms used to determine the HC of a facility or activity. DOE may direct that a higher HC designation be applied if it believes there are extenuating circumstances in the project or activity, such as implementing a new technology. Such direction could be the basis for a change order.

Fluor Fernald has designated the Silos 1 and 2 TTA as an HC-3 Nuclear Facility. The current safety basis for the facility is documented in the Basis for Interim Operations PL-3049, Section K and its supporting documents. This safety basis documentation will be integrated into the safety basis documentation for the Silos 1 and 2 Project.

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F07-
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Jacobs Engineering will be responsible for the preparation of the Safety Basis Documentation as part of their engineering and design activities. The Silos 1 and 2 Safety Analysis Team and Site Engineering Team members will provide seamless support to Jacobs Engineering by providing document preparation guidance and over-the-shoulder reviews of the Safety Basis Documentation relative to the format, level of detail, and the control of changes between the safety documentation and the engineering and design effort.

The scope, schedule, and resources for the Silos 1 and 2 Safety Basis will be managed and reported by the following five (5) key safety documents:

- 7) Safety Basis Documentation Implementation Plan
- 8) Preliminary Safety Basis Document
- 9) Final Safety Basis Document
- 10) Preliminary Documented Safety Analysis, and
- 11) Documented Safety Analysis

The schedule for all the Safety Basis activities is summarized under the Activity Hammock No. 106500. The following sections describe the scope, schedule, and planned resources for these key activities:

4.1) Subtask #1 - Safety Basis Documentation Implementation Plan

4.1)1 Plan/Scope - Safety Basis Documentation Implementation Plan

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Fluor Fernald, with Jacobs Engineering support, will prepare a Safety Basis Documentation Implementation Plan (SBDIP) consistent with FEMP site procedure NS-0005, Rev. 3. At a minimum, the SBDIP will include an identification and basic description of the segments, a preliminary site plan, a preliminary process block diagram, preliminary hazard assessments (PHA) and hazard category calculations (HCCs), a schedule for completion of the documentation, a description of the methodology to be used for the verification of the implementation of safety basis for the respective segment, and the approach for integration with the engineering and design effort.

The preparation of the SBDIP will begin immediately following the preparation of the Design Basis Package. The schedule for the SBDIP is summarized by the following activities in Table 1-5-39.

TABLE 1-5-39
 SBDIP SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
106510	SBD Implementation Plan (Hammock)	82	
106514	Prepare SBDIP	32	33%
106518	Review and Comment on SBDIP	20	60%
114048	Project Team Present SBDIP to ISRC		
111004	Incorporate Comments/Finalize SBDIP	20	85%
111008	Review/Approve SBDIP	10	100%

The schedule includes the Project Team performing an informal presentation of the SBDIP to the ISRC. Since the SBDIP will describe the method and framework for developing the safety basis documentation, the completion of the SBDIP process should finish prior to the beginning of the Preliminary Safety Basis Document.

4.1)2 Quantification - Safety Basis Documentation Implementation Plan

The SBDIP for the Silos 1 and 2 Project will be prepared by Silos 1 and 2 Site Engineering team members using FEMP Safety Analysis team members as independent resources for review and guidance. Selected Duratek and Jacobs Engineering personnel will peer review the preparation of the draft SBDIP. The resources required for completion of the SBDIP are planned under Project Management, Charge No. HS1AA.

4.2) Subtask #2 - Preliminary Safety Basis Document

4.2.1 Plan/Scope - Preliminary Safety Basis Document

In parallel to the ongoing development of the Preliminary Design Package, Jacobs Engineering and Fluor Fernald Safety Analysis team members will continue to develop the Preliminary Safety Basis Document. The Preliminary Safety Basis Document will also be supported by the following structured evaluations and analyses using engineering design information from the evolving Preliminary Design Package: Accident Analysis, an ALARA Analysis, HCCs, a FHA, a HFE, and an IHA. The Preliminary Safety Basis Document will include the most recent revisions of all the documentation submitted in the Conceptual Design Package.

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The preparation of the Preliminary Safety Basis Document and its supporting documentation will continue seamlessly following the preparation of the SBDIP. Any changes in this document would be incorporated as appropriate into the ongoing Preliminary Safety Basis Document. The schedule for the Preliminary Safety Basis Document and its supporting documentation is summarized by activity in Table 1.5-42.

**TABLE 1.5-42
 PRELIMINARY SAFETY BASIS DOCUMENTATION SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
108000	Preliminary Safety Basis Document (HAMMOCK)	165	1
Safety Basis Support Documentation Components			
112072	Preliminary Accident Analysis	75	16%
112076	Preliminary ALARA Analysis	75	16%
112080	Preliminary FHA	75	16%
112084	Preliminary HCCs	75	16%
112088	Preliminary HFE	75	16%
112092	Preliminary IHA	75	20%

Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can effect each other significantly. Therefore, for reporting purposes earned value will be weighted based on the identified milestones.

4.2)2 Quantification - Preliminary Safety Basis Document

The Preliminary Safety Basis Document and its supporting documentation will be supported by three (3) centralized Fluor Fernald Safety Analysis team members matrixed to the Silos 1 and 2 Project. These team members will continue to interface directly with Duratek and Jacobs Engineering personnel to ensure that a seamless and accurate exchange of information takes place. It is estimated that two (2) Fluor Fernald Safety Analysis team members and one (1) Fluor Fernald Silos Engineering team member would travel twice a month to the Duratek and Jacobs Engineering offices to facilitate the integration of information.

The Fluor Fernald Safety Analysis Organization will provide independent safety review and guidance of the safety basis documentation throughout this process. In addition, the FEMP ISRC will be used to provide expert review and input in a designated formal review of the Preliminary Safety Basis Document. The ISRC team is not chargeable to the project.

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The Fluor Fernald resources for the development of the Preliminary Safety Basis Document and its support documentation are summarized in Table 1.5-43. The Jacobs Engineering resources have been planned under Charge No. HS1AW.

**TABLE 1.5-43
 PRELIMINARY SAFETY BASIS DOCUMENTATION RESOURCE SUMMARY**

RESOURCE CODE	ACTIVITY NO. 108000 TOTAL RESOURCES (165 workdays)
LABOR (FTEs)	
DURATEK (TPHO)	0.1
ODCs	
Travel (3 members, \$1,228 per trip per member, 16 trips)	\$58,944
Federal Express	\$300
Subtotal ODCs	\$59,244

4.3) Subtask #3 - Final Safety Basis Document

4.3.1 Plan/Scope - Final Safety Basis Document

Jacobs Engineering and Fluor-Fernald will continue with the preparation of the Final Safety Basis Document in parallel with the Final Design Package. The Final Safety Basis Document will also be supported by the continuing structured evaluations and analyses using updated engineering and design information from the evolving Final Design Package: an Accident Analysis, an ALARA Analysis, HCCs, a FHA, a HFE, and an IHA. The Final Safety Basis Document will include the most recent revisions of all the documentation submitted in the Preliminary Safety Basis Document and Preliminary Design Package.

R1-
 F07-
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The preparation of the Final Safety Basis Document and its supporting documentation will continue seamlessly following the preparation of the Final Design Package. Any changes in the supporting documents would be incorporated as appropriate into the ongoing Final Safety Basis Document. The schedule for the Final Safety Basis Document and its supporting documentation is summarized by activity in Table 1.5-44.

**TABLE 1.5-44
 FINAL SAFETY BASIS DOCUMENTATION SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
108300	Final Safety Basis Document (HAMMOCK)	115	
Safety Basis Support Documentation Components			
112100	Final Accident Analysis	75	16%
112104	Final ALARA Analysis	75	16%
112108	Final FHA	75	16%
112112	Final HCCs	75	16%
112116	Final HFE	75	16%
112120	Final IHA	75	20%

Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can effect each other significantly. Therefore, for reporting purposes earned value will be weighted based on the identified milestones.

4.3)2. Quantification - Final Safety Basis Document

The Final Safety Basis Document and its supporting documentation will be prepared by Jacobs Engineering and supported by centralized Fluor Fernald Safety Analysis team members matrixed to the Silos 1 and 2 Project. These team members will interface directly with Duratek and Jacobs Engineering personnel to ensure that a continuous, complete and accurate exchange of information takes place. Two (2) Fluor Fernald Safety Analysis team members and one (1) Fluor Fernald Silos Engineering team member would travel twice a month to the Duratek and Jacobs Engineering offices to facilitate the integration of information.

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The Fluor Fernald Safety Analysis Organization will provide independent safety review of the safety basis documentation throughout this process. In addition, the FEMP ISRC will be used to provide expert review and input in a designated formal review of the Final Safety Basis Document. The ISRC team is not chargeable to the project.

The Fluor Fernald resources for the development of the Final Safety Basis Document and its support documentation are summarized in Table 1.5-45. The Jacobs Engineering resources are planned under Charge No. HS1AY.

**TABLE 1.5-45
 FINAL SAFETY BASIS DOCUMENTATION RESOURCE SUMMARY**

RESOURCE CODE	ACTIVITY NO. 108300 TOTAL RESOURCES (115 Workdays)
ODCs	
Travel (3 members, \$1,228 per trip per member, 10 trips)	\$36,840
Federal Express	\$300
Subtotal ODCs	\$37,140

4.4) Subtask #4 - Preliminary Documented Safety Analysis

4.4)1. Plan/Scope - Preliminary Documented Safety Analysis

A PDSA will be prepared by Fluor Fernald, Inc consistent with DOE-STD-3009-94 and FEMP site procedure NS-0005. A PDSA is required for DOE authorization to procure, construct, and test new HC-3 or above Nonreactor Nuclear Facilities. The authorization follows approval of preliminary design as per DOE Order 5480.23, 9.a.(1). The PDSA will be developed in parallel to the early engineering phase of this project to identify safety design criteria, analyze potential hazards, propose measures to eliminate, control, or mitigate these hazards, and analyze potential risks.

Throughout this process, Fluor Fernald Safety Analysis team members will interface with Duratek and Jacobs Engineering personnel to address and incorporate new information as the engineering and design effort evolves.

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As part of the overall procurement strategy for the Silos 1 and 2 Project, it is planned that specific systems and key components of the Silos 1 and 2 treatment process (i.e., dewatering system, remote handling systems) will need to be procured in advance so that the final design and final Safety Basis Documentation for the "balance of plant" facilities can be completed. This equipment will be identified by Jacobs Engineering as part of the development of the Preliminary Design Package. To minimize the risk associated with committing project funds during the emerging design effort, all long lead procurement actions will be divided into a fixed-price contract with an option as follows:

- Fixed-price base contract to provide required vendor engineering data, design drawings and performance information for each specified piece of equipment or system.
- Fixed-price Option to contract will include the fabrication, testing, installation, and startup of the equipment at the FEMP.

In order to expedite the project schedule, it is assumed that: 1) The DOE approval of the PDSA is not required to award the fixed-price base contract for design documents long lead procurement actions; and 2) The DOE approval of the PDSA is the only prerequisite activity to the award of the fixed-price option (fabricate, test, deliver, install, startup) for each long lead procurement action. Section 1.5.4 discusses long lead procurement actions in more detail.

Following receipt of comments on the Draft Preliminary Safety Basis Document, Jacobs Engineering and Fluor Fernald Safety Analysis team members will begin preparation of the PDSA. The schedule for development of the PDSA under Activity Hammock No. 108420 is summarized in Table 1.5-46.

**TABLE 1.5-46
 PDSA SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
108420	PDSA (Hammock)	170	
108088	Prepare Draft PDSA	25	25%
108092	Fluor Fernald Review and revise Draft PDSA	20	30%
108096	Fluor Fernald/DOE-FEMP Review Draft PDSA	20	35%
108100	Incorporate Fluor Fernald and DOE Comments and Revise PDSA	10	50%
109962	ISRC Review PDSA	30	
108102	Incorporate ISRC Comments and Revise PDSA	20	65%
114024	Fluor Fernald Accepts PDSA	15	75%
114040	ISRC PDSA Closure Meeting	0	
108104	DOE Review PDSA	30	
108108	Fluor Fernald Incorporates DOE Comments and Revises PDSA	20	90%
111060	DOE Approves PDSA	0	100%
114032	Present PDSA to ALARA Review Committee	0	

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Following preparation of the Draft PDSA, selected Fluor Fernald project personnel, including personnel from Duratek, Jacobs Engineering, affected FEMP functional area managers, and Fluor Fernald Independent Safety Analysis peer reviewers will review the Draft PDSA. To facilitate the subsequent DOE review and approval of the PDSA, draft copies of the PDSA may be provided to DOE-FEMP in advance to solicit early comments for early resolution. It is assumed that DOE will take thirty (30) workdays to formally review and provide written comments to Fluor Fernald Silos 1 and 2 Safety Analysis Team members will close out comment resolutions with DOE-FEMP and DOE.

4.4)2 Quantification - Preliminary Documented Safety Analysis

The Jacobs Engineering resources for the development of the PDSA are planned in Design (Charge No. HS1AW and HS1AY). The Fluor Fernald technical support, management, and oversight resources are planned in Project Management (Charge No. HS1AA).

4.5) Subtask #5 - Documented Safety Analysis

4.5.1 Plan/Scope - Documented Safety Analysis

A Documented Safety Analysis (DSA) will be prepared by Jacobs Engineering and Fluor Fernald, Inc Safety Analysis team members using the guidelines of DOE-STD-3009-94 and FEMP site procedure NS-0005. A DSA is required for DOE authorization to operate the Nonreactor Nuclear Facilities associated with this project. The DSA follows the final design package as per DOE Order 5480.23, 9.a.(2). The DSA will be prepared in parallel with construction activities and will be updated to be consistent with design changes and as-built conditions. The DSA will be developed prior to operation of the remediation facility and will identify hazards, describe and analyze the adequacy of measures taken to eliminate, control, or mitigate these hazards, and analyze and evaluate potential accidents and associated risks.

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Following receipt of comments on the Draft Final Safety Basis Document, Fluor Fernald Safety Analysis team members will begin preparation of the DSA. The schedule for development of the DSA Activity Hammock No. 108416 is summarized in Table 1.5-47.

TABLE 1.5-47
 DSA SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
108416	DSA (Hammock)	375	
108388	Prepare Draft DSA	25	25%
108392	Fluor Fernald Review and Revise Draft DSA	20	30%
108396	Fluor Fernald/DOE Review Draft DSA	10	35%
108400	Incorporate Fluor Fernald and DOE Comments and Revise DSA	10	50%
114020	ISRC Review of DSA	30	
108402	Incorporate ISRC Comments and Revise DSA	20	65%
114028	Fluor Fernald Accepts DSA	15	75%
114044	ISRC Comment DSA Closure Meeting	0	
108404	DOE Review DSA	30	
108408	Fluor Fernald Incorporates DOE Comments and Revises DSA	20	90%
116012	DOE Review DSA Changes	20	
108412	DOE Approves DSA with Safety Evaluation Report (SER)	5	100%
114036	Present DSA to ALARA Review Committee	0	

Following preparation of the Draft DSA, selected Fluor Fernald project personnel, including personnel from Duratek, Jacobs Engineering, affected functional area managers, and Fluor Fernald Independent Safety Analysis peer reviewers will review the Draft DSA. To facilitate the subsequent DOE review and approval of the DSA, draft copies of the DSA may be provided to DOE-FEMP in advance to solicit early comments for early resolution. It is assumed that DOE will take thirty (30) workdays to formally review and provide written comments to Fluor Fernald Safety Analysis team members will close out comment resolutions with DOE.

4.5)2 Quantification - Documented Safety Analysis

The Jacobs Engineering resources for the development of the FSAR are planned in Design (Charge No. HS1A2). The Fluor Fernald technical support, management, and oversight resources are planned in Project Management (Charge No. HS1AA).

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5) Task #5 - Regulatory Packages

Regulatory documentation packages will be developed and submitted to the EPA and OEPA for review and approval. Once approved by the EPA and OEPA, the regulatory packages will become controlling documents for the implementation of the requirements of this Closure Plan.

Regulatory Submittal Process

DOE is the lead agency for all remediation activities at the FEMP. All communication with the EPA, OEPA, and other agencies is coordinated by DOE and Fluor Fernald. Fluor Fernald is responsible for preparing all submittals that gain approval by the EPA and OEPA.

The following discussion identifies the submittal process to the EPA and OEPA:

- Documents requiring EPA and OEPA review and approval will be provided to DOE for review and approval in accordance with this closure plan (Section 1.2.4);
- Upon approval by Fluor Fernald, and DOE, DOE will provide the document to EPA and OEPA for concurrent review and approval;
- Fluor Fernald will allow 60 calendar days for concurrent reviews by EPA/OEPA;
- EPA/OEPA will provide written comments to DOE, who upon receipt in turn will provide the comments to Fluor Fernald for resolution;
- Fluor Fernald will assess the EPA/OEPA's comments to determine which organization should prepare a draft response. Fluor Fernald will notify Jacobs Engineering of the comments they are responsible for from the EPA/OEPA;
- If any review comments require clarification, Fluor Fernald will notify DOE and/or contact the EPA/OEPA directly (with concurrence of DOE);

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- Fluor Fernald will prepare a draft "Comment Response Document." The response to comments document will be in a traditional format and will provide for each comment: a restatement of the comment, a proposed response to the comment, and an identification of the action to be taken on the document to reflect the proposed response.
- It may or may not be necessary to submit a revised document along with the comment response document to the EPAs. Change pages may be submitted by Fluor Fernald in lieu of a complete revision of the deliverable.
- To assist the EPAs with comment resolution, the Fluor Fernald will provide a copy of final comment responses, final comment resolutions and a "redline/strikeout" version of the document, as appropriate, indicating all changes made to the document.
- Fluor Fernald will allow the EPAs 60 calendar days from their receipt of the comment response document and revised documentation to review and approve the document, or provide additional comments.
- Upon receipt of EPA/OEPA written approval, Fluor Fernald will begin implementation of the activities identified in the approved document.

It is assumed that all meetings with the EPA and OEPA related to the resolution of comments on all the Silos 1 and 2 RD/RA deliverables will be conducted at the FEMP. Therefore, no travel budget has been included in this Closure Plan for EPA/OEPA comment resolutions.

The scope, schedule, and resources for preparing Regulatory Packages will be managed by the following six (6) key regulatory document submittals:

- 7) Revised Remedial Design Work Plan
- 8) Remedial Design Packages
- 9) Remedial Action Work Plan
- 10) Remedial Action Package
- 11) NTS Disposal Evaluation and
- 12) Transportation and Disposal Plan

The schedule for development of all regulatory packages is summarized under the Activity Hammock No. 100012, RD/RA Deliverables. The resources will be managed and reported under Charge No. HS1AA. The following sections describe the scope, schedule, and planned resources for the regulatory packages.

5.1) Subtask #1 - Revised Remedial Design Work Plan

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In September 2000, the EPA and OEPA approved the Remedial Design Work Plan (RDWP) for the OU4 Silos 1 and 2 Project, Rev. 0, (40700-WP-0003). The EPA recognized that the Silos 1 and 2 remediation strategy proposed by the Contractor under the new FEMP Site Closure Contract could vary from that which was originally approved by EPA. The EPA-approved RDWP provides for the revision and resubmittal of a revised Silo 1 and 2 RDWP to the EPA and OEPA for approval once a final path forward for the Silos 1 and 2 is baselined.

5.1.1) Plan/Scope - Revised Remedial Design Work Plan

Fluor Fernald Silos Project Team will develop a revised RDWP for submittal and approval by the EPA and the OEPA. The RDWP will reflect the implementation strategy identified in this Closure Plan. The RDWP will briefly discuss how the remedial design will be accomplished, define the contents of the specified regulatory submittals, and establish the enforceable milestones for the RD submittals to the regulatory agencies.

It is assumed that the revised RDWP will be prepared consistent with the ongoing rebaselining effort for the Silos 1 and 2 Project. This regulatory submittal must be reviewed and approved by DOE-FEMP, prior to its submittal to the EPA and OEPA. Based upon past project experience, it is assumed that DOE-FEMP will only require ten (10) working days to review the draft RDWP. In accordance with the Amended Consent Agreement it is assumed that EPA and OEPA will require 60 calendar days (40 working days) to both review and 30 days to approve the RDWP. The following Table 1.5-48 summarizes the planned activities and milestones for reporting progress for this effort.

**TABLE 1.5-48
 RDWP SCHEDULE**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
100017	RDWP (Hammock)	120	0%
100022	Fluor Fernald Prepare Draft RDWP	20	20%
100027	Fluor Fernald Review Draft RDWP	10	30%
100032	Fluor Fernald Revise Draft RDWP	5	35%
100037	DOE-FEMP Review Draft RDWP	10	45%
100042	Fluor Fernald Revise RDWP	5	50%
100047	EPA/OEPA Review RDWP	40	75%
100052	Fluor Fernald Revise RDWP	10	90%
100057	EPA/OEPA Review RDWP and Approve RDWP	20	100%

5.1)2 Quantification - Revised Remedial Design Work Plan

The revised RDWP will be prepared by Fluor Fernald Silos 1 and 2 Engineering team members, and peer reviewed internally by selected Duratek and Fluor Fernald personnel. Fluor Fernald team members will address comments resulting from the peer review, DOE review, and EPA/OEPA review cycles and revise the document accordingly. The labor resources for developing the RDWP are planned in Project Management Charge No. HS1AA. The ODCs for developing the RDWP are summarized in Table 1.5-49.

**TABLE 1.5-49
 SUMMARY OF RESOURCES FOR THE RDWP**

RESOURCE CODE	TOTAL RESOURCES
FEDEX	\$300
CRITICAL ANALYSIS TEAM SUBCONTRACT	\$3,000
Total ODCs	\$3,300
	\$300

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5.2) Subtask #2 - Remedial Design Packages

5.2)1 Plan/Scope - Remedial Design Packages

Jacobs Engineering will submit principal elements of the preliminary design submittals which will be compiled into two RD Packages by Fluor Fernald for EPA/OEPA review and approval. The first RD Package will address the advanced construction packages (Section 1.5-5) which will be developed during the preliminary design. The second RD Package will address the balance of plant facilities. The RD Packages will describe the design and operation of the remediation facility to successfully stabilize the Silos 1 and 2 material in a manner that will ensure protection of worker and public health, safety, and the environment. The RD Packages will also describe the environmental controls that will be used during construction and operations activities of the facility to ensure protection of human health and the environment.

The submittal of the RD Packages to the EPA/OEPA for review and approval is an enforceable milestone pursuant to the EPA-approved RDWP. The schedule for the RD Packages is summarized by the following activities in Tables 1.5-50 and 1.5-50A.

TABLE 1.5-50
REMEDIAL DESIGN PACKAGE - ADVANCED CONSTRUCTION
SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101690	RD Package - Advanced Construction (Hammock)	126	100%
MAJOR RD PACKAGE (COMPONENTS)			
108834	Engineering Package (Hammock)	20	10%
108926	Pre-Ops/Ops Environmental Control Plan (Hammock)	20	20%
108790	Pre-Ops Schedule (Hammock)	20	30%
108970	Pre-Ops Health and Safety Controls (Hammock)	20	40%
108842	Fluor Fernald/DOE Review Draft RD Package	10	50%
108846	Finalize Draft RD Package	5	60%
108850	Fluor Fernald/DOE Review/Accept RD Package	5	65%
108854	EPA/OEPA Review RD Package	41	75%
108858	Fluor Fernald/DOE Review EPA Comments	5	80%
108862	Develop Response to Comments/Final RD Package	10	90%
108866	Fluor Fernald/DOE Complete Response To Comments/Submit RD Package to EPA	5	100%
108870	EPA/OEPA Review/Approve RD Package	20	100%

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TABLE 1.5-50A
REMEDIAL DESIGN PACKAGE - BALANCE OF PLANT
SCHEDULE SUMMARY

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
108875	RD Package - Balance of Plant (Hammock)	167	100%
MAJOR RD PACKAGE (COMPONENTS)			
108877	Prepare Document (Pre-Ops Schedule)	55	10%
108879	Prepare Draft RD Package	55	25/50%
108881	Prepare Document (Engineering Package)	55	10%
108883	Prepare Document (Environmental Control Plan)	55	10%
108885	Fluor Fernald Perform Dispersion Modeling	58	10%
108887	Prepare Document (Pre-Ops HASC)	40	10%
108889	Fluor Fernald/DOE Review/Draft RD Package	10	10%
108891	Develop CRD - Draft RD Package	5	10%
108893	Finalize Draft RD Package	10	75%
108895	Fluor Fernald/DOE Review/Accept Final Draft RD Package	5	10%
108899	EPA/OEPA Review Draft RD Package	41	80%
108901	Fluor Fernald/DOE Review and Draft Response to Comments	5	10%
108903	EPA/OEPA Concur with Response to Comments	1	10%
108905	Revise Final RD Package	10	90%
108907	Assemble Final RD Package	5	10%
108911	EPA/OEPA Review/Approve RD Package	20	100%

The Draft RD Packages will be reviewed in parallel by Fluor Fernald and DOE-FEMP, Silos 1 and 2 team members, and the Critical Analysis Team.

5.2)2 Quantification - Remedial Design Packages

The overall assembly of the RD Package and coordination of its review and approval with DOE, EPA and OEPA will be performed by Silos 1 and 2 Site Engineering Team Members. Jacobs Engineering and the Silos 1 and 2 Site Engineering Team members will be responsible for preparing specific components of the RD Package. The Jacobs Engineering resources for developing the Silos 1 and 2 RD Package are included in the manpower planning for the Silos 1 and 2 Design (Charge Nos. HS1AW and HS1AY). Fluor Fernald technical support, project management, and oversight are planned under Project Management (Charge No. HS1AA). Table 1-5-51 summarizes the ODCs for preparing the RD Package.

TABLE 1-5-51

RESOURCE SUMMARY FOR THE RD PACKAGE

RESOURCE CODE	ACTIVITY NOS. 101690 AND 108875 RESOURCES
ODCS	
FEDEX	\$1,000

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5.3) Subtask #3- Remedial Action Work Plan

5.3)1 Plan/Scope - Remedial Action Work Plan

Following approval of the RD Package by the EPA and OEPA, Fluor Fernald will develop a Remedial Action Work Plan (RAWP) for submittal and approval by the EPA and OEPA. The RAWP will reflect the implementation strategy and establish enforceable operational milestones for the remedial action (RA) phase of the Silos 1 and 2 Project. The enforceable milestones will be based upon the project schedule.

This regulatory submittal must be reviewed and approved by DOE-FEMP, prior to its submittal to the EPA/OEPA. Based upon past experience, it is assumed that DOE-FEMP will only require ten (10) working days to review the draft RAWP. In accordance with the Amended Consent Agreement, it is assumed that EPA and OEPA will require 60 calendar days to review and 30 days to approve the RAWP. The following Table 1-5-50 summarizes the planned activities and milestones for reporting progress for this effort.

**TABLE 1.5-52
 RAWP SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101940	RAWP (Hammock)	170	
101964	Fluor Fernald - Prepare RAWP (Start)	0	10%
101964	Fluor Fernald - Prepare RAWP (Complete)	60	35%
101968	Fluor Fernald/DOE Review RAWP	20	45%
101972	Incorporate Review Comments - RAWP	10	
101976	Submit to EPA/OEPA - RAWP		50%
101980	EPA/OEPA Review - RAWP	40	70%
101984	Fluor Fernald Revise RAWP	20	85%
101988	EPA/OEPA Approve RAWP	20	100%

5.3)2. Quantification - Remedial Action Work Plan

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The RAWP will be prepared by Fluor Fernald and Silos 1 and 2 Site Engineering Team members, and peer reviewed internally by selected Duratek Services and Fluor Fernald personnel. Fluor Fernald team members will address comments resulting from the peer review, DOE review, and EPA/OEPA review cycles and revise the document accordingly. The Jacobs Engineering resources for developing the Silos 1 and 2 RAWP are included in the manpower planning for the Silos 1 and 2 Design (Charge No. HS1AY). Fluor Fernald technical support, project management, and oversight are planned under Project Management (Charge No. HS1AA). Table 1.5-53 summarizes the ODCs for preparing the RAWP.

**TABLE 1.5-53
 SUMMARY RESOURCES FOR THE RAWP**

RESOURCE CODE	TOTAL RESOURCES
ODCs	
FEDEX	\$200

5.4) Subtask #4 - Remedial Action Package

5.4)1. Plan/Scope - Remedial Action Package

Fluor Fernald will develop and submit principal elements of the RA documents as a single package for compliance review and approval by DOE, EPA and OEPA before authorization to operate. Elements of the RA Package will include an updated Operational Environmental Control Plan, a Sampling and Analysis Plan, a Health and Safety Plan for Remedial Action Operations, a Gross Decontamination Plan, and an O&M Plan.

The submittal of the RA Package to the EPA/OEPA for review and approval is an enforceable milestone pursuant to the EPA approved RAWP. The schedule for the RA Package is summarized by the following activities in Table 1.5-54.

**TABLE 1.5-54
 REMEDIAL ACTION PACKAGE SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
101870	RA Package (Hammock)	199	
MAJOR RA PACKAGE COMPONENTS			
109328	O&M Plan/RA Facilities (Hammock)	65	10%
109240	OPs Environmental Control Plan (Hammock)	65	20%
109372	Sampling & Analysis Plan (Hammock)	65	30%
109284	O&M Health & Safety Controls (Hammock)	40	40%
109332	Fluor Fernald/DOE Review Draft RA Package	20	50%
109336	Finalize Draft RA Package	20	60%
109340	Fluor Fernald/DOE Review/Accept RA Package	4	65%
109342	Submit RA Package to EPA/OEPA		
109344	EPA/OEPA Review RA Package	40	75%
109348	Fluor Fernald/DOE Review Draft RA Package Comments	5	80%
109352	Develop Response To Comments/Finalize RA Package	20	90%
109356	Fluor Fernald/DOE Complete Response To Comments/Submit Final RA Package	5	
109360	EPA Review/Approve RTC and Final RA Package	20	100%

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The Draft RA Package will be reviewed in parallel by Fluor Fernald, DOE-FEMP, and Silos 1 and 2 team members.

5.4.2 Quantification - Remedial Action Package

The overall assembly of the RA Package and coordination of its review and approval with DOE, EPA and OEPA will be performed by Silos 1 and 2 Site Engineering Team members. Jacobs Engineering and the Silos 1 and 2 Site Engineering Team members will be responsible for preparing specific components of the RA Package. The Jacobs Engineering resources for developing the Silos 1 and 2 RA Package are included in the manpower planning for the Silos 1 and 2 Design (Charge No. HS1AY). Fluor Fernald technical support, project management, and oversight are planned under Project Management (Charge No. HS1AA). Table 1.5-55 summarizes the ODCs for preparing the RA Package.

**TABLE 1.5-55
 RESOURCE SUMMARY FOR THE RA PACKAGE**

RESOURCE CODE	ACTIVITY NO. 101870 TOTAL RESOURCES
ODCs	
FEDEX	\$1,000

5.5) Subtask #5 - NTS Waste Disposal Evaluation

5.5)1 Plan/Scope - NTS Waste Disposal Evaluation

NTS WAC DOE/NV-325-Rev. 3, December 2000 describes the requirements, terms, and conditions under which the NTS will accept low-level radioactive waste. Fluor Fernald Waste Certification Program Plan (WCPP), PL-3067, Rev. 5, dated 9/27/00, describes programs and processes utilized by the FEMP to ensure low-level radioactive waste shipped to the NTS conforms with all pertinent federal, state, and local regulations and the NTS WAC.

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A waste profile must be prepared for the treated wasteform for the Silos 1 and 2 material and each secondary wastes streams destined for the NTS after they have been identified and characterized. The waste profile must be prepared and submitted to the DOE-NV for each waste stream in accordance with FEMP Procedure No. EW-1026, Nevada Test Site Waste Profile Preparation, Rev. 1, dated 3/21/2000. The waste profile summarizes the wasteform and characterization data (physical, chemical, radiological) packaging description and appropriate project-specific ALARA documentation. This documentation is prepared by the FEMP Waste Generator Services Division with input from the Silos 1 and 2 Site Engineering Team.

DOE-NV uses the waste profile to verify that the packaged waste streams being shipped to the NTS comply with the NTS WAC. The information is also used by the NTS to determine the proper disposal configuration of each waste stream to ensure compliance with the NTS performance assessment.

The FEMP Waste Generator Services Division and DOE-NV will be involved in the development and selection of the waste container for the treated Silos 1 and 2 material (Section 1.5.3, Task 3).

The preparation of the waste profiles for the Silos 1 and 2 waste streams are driven by the completion of two project activities. The first is NTS acceptance of the Final Container Design Package for the treated Silos 1 and 2 material (Activity No. 102276). The second is completion of Preliminary Design (Activity No. 101673) which identifies all waste streams destined for the NTS. Table 1.5-56 provides a summary of the schedule for completing the NTS Waste Disposal Evaluation.

TABLE 1-5-56
SCHEDULE SUMMARY FOR THE NTS WASTE DISPOSAL EVALUATION

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
114052	NTS Waste Disposal Evaluation (Hammock)	205	
114056	Initiate NTS Waste Disposal Evaluation (Start)	0	10%
114056	Initiate NTS Waste Disposal Evaluation (Complete)	80	30%
114060	DOE-NV Review Waste Profile Information	40	60%
114064	Fluor Fernald Revise Waste Profiles	20	70%
114068	Waste Profile Resolution Meeting	5	
114072	Finalize Waste Profiles	20	80%
114076	Fluor Fernald Bluesheet Review Final Waste Profiles	10	
114080	DOE-NV Review Final Waste Profiles	20	90%
114084	DOE-NV Accept Final Waste Profiles	10	100%

Following completion of the Nevada Test Site Waste Disposal Evaluation, Silos 1 and 2 Site Engineering will begin preparation of the Transportation and Disposal Plan (Section 1.5.3, Task 5, Subtask 6).

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5.5)2 Quantification - NTS Waste Disposal Evaluation

The Nevada Test Site Waste Disposal Evaluation activities will be managed by the Silos 1 and 2 Site Engineering Team members. The FEMP Waste Generator Services Division will provide lead support in the development of waste profiles and coordination with the DOE-NV review and approval process. Fluor Fernald resources are planned under Project Management, Charge No. HS1AA. Table 1-5-57 provides the ODC summary for the NTS Waste Disposal Evaluation activities.

TABLE 1-5-57
SUMMARY RESOURCES FOR THE NEVADA TEST SITE WASTE DISPOSAL EVALUATION

RESOURCE CODE	ACTIVITY NUMBER								TOTAL RESOURCES ACTIVITY NUMBER
	114056	114060	114064	114068	114072	114076	114080	114084	
ODCs									114052
FEDEX		\$100		\$100		\$100	\$100		\$400
TRAVEL (4 trips to Las Vegas @ \$2543/trip)		\$10,172		\$10,172			\$10,172		\$30,516
TOTAL		\$10,272		\$10,272		\$100	\$10,272		\$30,916

5.6) Subtask #6 - Transportation and Disposal Plan

5.6)1 Plan/Scope - Transportation and Disposal Plan

The Transportation and Disposal Plan (TDP) describes how the Silos 1 and 2 Project transportation and disposal operations will be implemented to ensure safe and successful storage, staging, transportation and disposal of treated Silos 1 and 2 material from the FEMP to the NTS. The preparation and submittal of the TDP to the EPA and OEPA will be submitted separately as defined by the RDWP. The TDP serves to:

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- Describe the staging and transportation logistics associated with the treated Silos 1 and 2 material;
- Describe operational aspects of transportation plans to demonstrate that treated Silo 1 and 2 material can be safely transported to the NTS, and in accordance with applicable regulations;
- Provide a transition between design and implementation of transportation operations; and
- Demonstrate how the treated Silos 1 and 2 material can be safely disposed at the NTS.

The schedule for the preparation of the TDP is driven by two prior activities. The first is selection and development of the container to package the treated Silos 1 and 2 material (Section 1.5.3, Task 3). The second is completion of the disposal configuration evaluation by the NTS (Section 1.5.3, Task 5).

The TDP submittal must be reviewed and approved by the DOE-FEMP, prior to its submittal to the EPA and OEPA. It is assumed that DOE-FEMP will only require ten (10) working days to review the draft TDP. In accordance with the Amended Consent Agreement, it is assumed that EPA and OEPA will require 60 calendar days (40 working days) to review and approve the TDP. The following Table 1.5-58 summarizes the planned activities and milestones for the reporting of progress for this effort.

**TABLE 1.5-58
 TRANSPORTATION AND DISPOSAL PLAN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (Workdays)	MILESTONE
105000	TDP (Hammock)	124	
105004	Fluor Fernald Prepare TDP	25	20%
105008	DOE Review/Comment TDP	10	30%
105012	Fluor Fernald Incorporate Review Comments - TDP	10	40%
105016	Fluor Fernald submit to EPA/OEPA - TDP	0	50%
105020	EPA/OEPA Review/Comment - TDP	40	60%
105024	Incorporate EPA/OEPA Comments - TDP	15	80%
105028	DOE Review/Accept - TDP	5	90%
105032	Submit TDP to EPA/OEPA	0	100%

105036	EPA/OEPA Review/Approve - TDP	40	100%
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The EPA and OEPA approval of the TDP is a prerequisite to the preparation of an RFP to obtain the services of a qualified Transportation Vendor to ship the Silos 1 and 2 to the NTS (Section 1.5.11, Task 4).

5.6)2. Quantification - Transportation and Disposal Plan

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The TDP will be prepared by Fluor Fernald and Silos 1 and 2 Site Engineering Team members, and peer reviewed by selected Duratek Services personnel. Silos 1 and 2 Site Engineering Team members will address comments resulting from the peer review, DOE review, and EPA and OEPA review cycles and revise the document accordingly. Fluor Fernald technical support, project management, and oversight resources are planned in Project Management, Charge No. HS1AA. The ODCs for developing the TDP are summarized in Table 1.5-59.

TABLE 1.5-59

SUMMARY RESOURCES FOR THE TRANSPORTATION AND DISPOSAL PLAN

RESOURCE CODE	ACTIVITY NO. 105000 TOTAL RESOURCES
ODCs	
FEDEX	\$200

1.5.4 HS1AD - Construction Management

In accordance with the contracting strategy for the Silos 1 and 2 Project, Fluor Fernald will act as the General Contractor for the construction of all the Silos 1 and 2 remediation and support facilities.

The Silos 1 and 2 Project team will strategically divide the design and specifications of the construction scope into logical bid packages, i.e., by discipline – Civil, Mechanical, and Electrical. Fixed-Price Contracts will be secured through an Invitation to Bid process for each bid package. Wise Services, Inc. will be used for interface work between the Fixed-Price Contracts. Fluor Fernald will perform CAT and ICAT. Fluor Fernald and Jacobs Engineering will jointly provide Title III field service support.

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029

The scope, schedule, and resources for the Silos 1 and 2 Construction Management will be managed and reported under the following ~~four (4)~~ **three (3)** key activities:

- Construction Design Support;
- Construction IFB Support; and
- Construction Subcontract Management.

The resources will be managed and reported under charge number HS1AD. The following sections describe the scope, schedule and planned resources for these key activities.

1) Task #1 - Construction Design Support

1.1) Plan/Scope - Construction Design Support

This scope of work will be performed by Fluor Fernald and includes constructability reviews, infrastructure coordination, and planning and bidding support.

The design constructability review process involves evaluating and integrating practical construction practices and requirements into the design configuration by ensuring safety; efficiency; cost and schedule benefits; productivity in field construction operations; safe accessibility of personnel, material, and equipment; facilitation of construction during adverse weather; sequencing activities to facilitate system turnover and start up; and the use of innovative construction methods to enhance constructability. Constructability reviews also include waste planning, and decontamination and demolition planning.

Silos 1 and 2 Project construction will be integrated with the existing FEMP infrastructure. Coordination planning involves Site/Use Allocation Committee, Silos Facility Owner, Utilities Engineer, Fire Protection Engineering, and AWWT. The Silos 1 and 2 Project is also responsible for interfacing with adjacent projects.

Construction also assists in the preparation of scope and requisitions for work/services that are outside of the scope in the contract, including services previously identified as being provided by Fluor Fernald and is responsible for preparing the construction schedule, draft QA/QC requirements, developing construction estimates, developing pay item description including breakdown of work items and tasks, sequence of work, scope of work and re-submitting work scope/work package for labor standards determination, and pre-qualification of bidders.

Activity Hammock No. 102502, entitled "Construction Design Support" begins with the constructability reviews during the Preliminary Design Package, Activity No. 101670 and lasts through the completion of the Final Design Package, Activity No. 101732. Earned value on this activity will be apportioned from the progress on design activities supported by this activity.

1.2) Quantification - Construction Design Support

Construction design support which involves the development of the Silos 1 and 2 Preliminary Design and Final Design Packages.

The construction management staff supporting the overall construction program for the Silos 1 and 2 Project includes a single overall construction contracts manager directing the efforts of separate construction engineer and coordinators for each of the three major contracts (electrical, civil, and mechanical). The construction design support resources are summarized by Tables 1.5-60a, b, and c.

**TABLE 1.5-60
 RESOURCE SUMMARY FOR CONSTRUCTION MANAGEMENT**

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RESOURCE CODE	ACTIVITY 102502 DESIGN SUPPORT	ACTIVITY 101913 IEE SUPPORT	ACTIVITY 102504 CONTRACT MANAGEMENT
LABOR			
CNSENG	1.42	3.00	3.00
CNSCOD	0.16	3.00	3.00
WSTMGR	-	0.31	0.50
WSTENG	-	0.80	1.00
S&HENG	0.37	1.60	2.50
RADTEC	-	0.40	5.42
QACTEC	0.05	1.50	3.76
QACENG	-	0.10	0.46
ODCs			
FEDEX	0	\$5,000	0

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TABLE 1.5-60a

RESOURCE SUMMARY FOR CONSTRUCTION MANAGEMENT DESIGN SUPPORT

Resource Code	CONSTRUCTION DESIGN SUPPORT - ACTIVITY NO. 102502																		
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
CNSCOD																			0.5
CNSCOD																			0.5
CNSENG																			1.0
CNSENG																			0.5
CNSENG																			0.5
CNSENG													0.5	0.5	0.5	0.5	0.5	0.5	0.5
ENGMEC				0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ENGMGR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
QACTEC																			1.0
S&HENG													1.0	1.0	1.0	1.0	1.0	1.0	1.0



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TABLE 1.5-60b

RESOURCE SUMMARY FOR THE CONSTRUCTION MANAGEMENT IFB/RFP SUPPORT

Resource Code	CONSTRUCTION IFB/RFP SUPPORT – ACTIVITY NO. 101914									
	M	J	J	A	S	O	N	D	J	F
CNSCOD	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CNSCOD	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CNSCOD	-	-	-	-	-	-	-	-	1.0	1.0
CNSENG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CNSENG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CNSENG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CNSENG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ENGMEC	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ENGMGR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
QACENG	-	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
QACTEC	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0
RADTEC	-	-	-	-	-	-	-	-	2.0	2.0
S&HENG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Resource Code	CONSTRUCTION IFB/RFP SUPPORT – ACTIVITY NO. 101914									
	M	J	J	A	S	O	N	D	J	F
S&HENG	-	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
WSTENG	-	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
WSTMGR	-	-	-	-	-	0.5	0.5	0.5	0.5	0.5
ODCs (\$)										
FED EX	500	500	500	500	500	500	500	500	500	500

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TABLE 1.5-60c
RESOURCE SUMMARY FOR THE CONSTRUCTION CONTRACT MANAGEMENT

Resource Code	CONSTRUCTION CONTRACT MANAGEMENT – ACTIVITY NO. 102504																	
	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A
CNSCOD	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CNSCOD	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CNSCOD	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-
CNSENG	-	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CNSENG	-	-	-	-	-	-	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Resource Code	CONSTRUCTION CONTRACT MANAGEMENT - ACTIVITY NO. 102504																	
	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A
CNSENG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-
CNSENG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CNSENG	-	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CNSENG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CNSENG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ENGMEC	0.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ENGMGR	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	-	-	-	-	-
QACENG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
QACTEC	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0
RADTEC	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
S&HENG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
S&HENG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
WSTENG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
WSTMGR	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ODCs (\$)	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K	2K

2) Task #2 - Construction IFB Support

2.1) Plan/Scope - Construction IFB Support

Activity Hammock No. 101914, entitled "Construction IFB Support" begins with the preparation of the IFB packages and lasts through completion of the award of all the construction contracts.

It is assumed that IFB/RFP(s) will be prepared using the nine (9) part model contract pursuant to FEMP Procedure CT-2.1.1 (Rev. 11).

When the engineering design package reaches preliminary status of completion, construction personnel will begin preparing bid packages for construction subcontractors. IFB preparation includes:

- Develop IFB/RFP Package;
- Draft Safe Work Plans for inclusion in the IFB/RFP, Part 8;
- Draft construction testing requirements (Quality Evaluation Plans (QEPs) or Source Inspection Plans (SIPs), Part 9;
- Draft Turnover Plan;
- Contractor Submittal Register, Part 6;
- Scope of Work, Part 6;
- Pay-item Description, Part 6; and
- Assembly of Certified for Construction drawings and specifications, Part 7.

The final construction estimates will be developed during this stage of the project, as well as the PWID for waste identification and disposition.

The IFB bid process starts by releasing the IFB package and conducting a pre-bid meeting with subcontractors. The bidding and award phase includes:

- Completing government estimate;
- Bidder comment resolution;
- Bid/proposal review and technical evaluation;
- Award contract; and
- Revise baseline to reflect contract award.

Construction Safe Work Plans will be developed by Fluor Fernald and/or the subcontractor, describing the work in sufficient detail to provide assurance that the risks associated with the work have been assessed and preventive measures for hazards addressed, and the work has been safely planned in sufficient detail. A draft of each safe work plan will be included in the IFB package, with the final safe work plans being completed by the subcontractor after contract award.

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The IFB packages for the Civil, Mechanical, and Electrical work will be prepared and released for bids in parallel to each other. Activity Hammock No. 101914, "IFB Packages" summarizes the schedules for the IFB Package preparation and Bid and Award activities for all three procurement actions. Table 1.5-61 summarizes the activities, their durations, and milestones for reporting the earned value progress for each procurement action.

The IFB packages for the Civil, Mechanical, and Electrical work will be prepared and released for bids in parallel to each other. Activity Hammock No. 101914, "IFB Packages" summarizes the schedules for the IFB Package preparation and Bid and Award activities for all three procurement actions. Tables 1.5-61 and 1.5-61A summarizes the activities, their durations, and milestones for reporting the earned value progress for each procurement action.

**TABLE 1.5-61
 SUMMARY SCHEDULES FOR SILOS 1 AND 2 PROJECT IFB PACKAGES PREPARATION**

ACTIVITY NUMBER			ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
CIVIL IFB	ELECTRICAL IFB	MECHANICAL IFB			
121510	121520	121530	Prepare IFB Package (HAMMOCK)	85	-
121005	121700	121300	Fluor Fernald Eng. Develop CAT Requirements	20	10%
121010	121705	121305	Construction Prepares IFB Package	20	25%
121015	121710	121310	Project Team Revises IFB Package	10	50%
121050	121745	121345	Fluor Fernald Prepares Independent Government Estimate	30	-
121020	121715	121315	Construction Revises IFB Package	10	60%
121025	121720	121320	Contract Review Board Reviews IFB Package	5	65%
121030	121725	121325	Construction Revises IFB Package	5	70%
121055	121750	121350	Review Independent Government Estimate	10	-
121035	121730	121330	DOE parallel reviews IFB Package	20	75%
121060	121755	121355	Finalize Independent Govern. Estimate	20	-
121040	121735	121335	Construction Revises IFB Package	10	90%

121065	121740	121340	IFB Package issue to Vendors	5	100%
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TABLE 1.5-61A
SUMMARY SCHEDULES FOR SILOS 1 AND 2 PROJECT IFB BID AND AWARD

R1- F07- 030	ACTIVITY NUMBER			ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
	CIVIL IFB BID AND AWARD	ELECTRICAL IFB BID AND AWARD	MECHANICAL IFB BID AND AWARD			
	121090	121760	121360	Vendors Submit Bids	20	25%
	121092	121762	121362	Pre-Bid Meeting	1	-
	121095	121765	121365	Open Bids	0	-
	121100	121770	121370	Prepare Consent Package	15	50%
	121105	121775	121375	CRB Reviews Consent Package	10	60%
	121102	121780	121380	Fluor Fernald Revises Consent Package	10	70%
	121103	121785	121385	CRB Approves Consent Package	5	-
	121106	121790	121390	DOE-FEMP Reviews Consent Package	20	80%
	121110	121795	121395	Fluor Fernald Revises Consent Package	10	85%
	121115	121800	121400	DOE-HQ Reviews Consent Package	20	-
	121120	121805	121405	Fluor Fernald Revises Consent Package	10	90%
	121125	121810	121410	DOE-HQ Approves Consent Package	5	95
	121130	121815	121415	Fluor Fernald Awards Contract	1	100%

2.2) Quantification - Construction IFB Support

The resources for the IFB Preparation and the Bid and Award process are loaded into the Activity Hammock No. 101914, entitled "Construction IFB Support". The resources increase to 11 FTEs during this timeframe and are summarized in Table 1.5-60. Progress reported on lower their activities will be used to apportion earned value.

3) Task #3 - Construction Subcontract Management

3.1) Plan/Scope - Construction Subcontract Management

During construction, Fluor Fernald will perform daily oversight of subcontractors to ensure that the requirements of the contract are being followed in the field, including safety performance, compliance with Remedial Design plans, and verification of installation per approved drawings and specifications. Subcontract management also involves providing permits in accordance with the planned work and tracking the subcontractor's schedule. Subcontract management also includes:

- Submittal(s) review and approval;
- Finalize Safe Work Plans;
- Safety Meetings;
- Permits;
- Mobilization;
- Construction Testing Requirements (QEPs, SIPs);
- Request for Information/Design Change Notices;
- Contract Modifications;
- Quality Assurance (surveillance(s) and assessments);
- Progress reporting (cost and schedule); and
- Red-line and as-built drawings.

The roles and responsibilities for Construction Contracts Manager (CCM), Construction Engineer, and Construction Coordinator are specified in Procedure CT-1.3.1. The Construction Manager or CCM is responsible for, but not limited to:

- Monitor contractor activities;
- Administer the contract;
- Assure the contractor has provided adequate Safe Work Plans to comply with site, safety, engineering, quality and administrative functions, and performs work in a safe and compliant manner;

- Approve the contractor baseline schedule, coordinate monthly updates for process payments with project control;
- Approve contractor pay items, coordinate inputs with project control;
- Ensure that the contractor takes corrective action in areas that have safety, environmental, quality, progress or work related problems;
- Conduct weekly progress/schedule meetings with the contractor;
- Monitor construction budget and schedule
- Assure environmental provisions of the contract are enforced.

The Construction Engineer provides technical support within its discipline to the CCM, as well as:

- Coordinate the resolution of all construction technical or procedural problems with the appropriate design organization for department;
- Assure the contractor performs the work in accordance with drawings, specifications, plans and procedures; and
- Attend safety briefings and perform job walkdowns.

The Construction Coordinator:

- Coordinates required Fluor Fernald services including permits, laundry, packaging, other support services;
- Maintains daily log and daily activity reports to record significant events and to provide project history;
- Progress photos and videos;
- Attends safety briefings and perform job walk-throughs;
- Coordinate testing and startup services.

Performance against this activity will be apportioned based on subcontractors' performance.

Construction Safe Work Plans

Construction safe work plans will be developed, describing the work to be performed in sufficient detail to ensure that the risks associated with the work have been assessed and preventive measures for the hazards addressed. The risks, hazards, and mitigators will be identified in the Project-Specific Health and Safety Requirements Matrix.

To ensure clear communication and expectations with the contractor, draft Safe Work Plans with minimum requirements will be developed by Fluor Fernald and included as attachments to the IFB/RFP. The contractor will be expected to provide additional detail, for each task, after award of the contract, for final approval of the Safe Work Plan(s). The Safe Work Plan is intended to be a briefing document that has incorporated the guiding principles and core functions of Integrated Safety Management systems.

Safe Work Plans will be developed for the following tasks:

- Mobilization (receipt of materials, equipment deliveries, and inspections);
- Miscellaneous excavation activities (foundation and underground activities, gravel placement) including erosion controls;
- Concrete work (formwork, placement and cutting);
- Steel work (including re-steel);
- Containment (tension support structure) erection;
- Miscellaneous containment construction (interior work);
- Equipment setting;
- Piping installation (underground, overhead, and ductwork), including Energy Isolation;
- Plans (EIPs);
- Electrical Work (lock and tag), including EIPs;
- Trailer Installation;
- Tying into the RCS and TTA systems; and
- Decontamination of tools and equipment.

The Safe Work Plan will be in accordance with ACR-002, Contractor Safe Work Plan Format Requirements.

Safety and Health Oversight

Permits will be issued by Fluor Fernald after approval of a Safe Work Plan. Permits include: Work permits; Radiological, Penetration; Service Interruption; EIPs; Open Flame and Welding; Confined Space Evaluation; Chemical Hazardous Material; and Scaffold Inspection Checklist/Access. Fluor Fernald shall provide 100% oversight during penetration/excavation activities and lock and tag activities.

Fluor Fernald will provide monitoring required for Heat and Cold Stress, radiological surveys, and monitoring.

Fluor Fernald will provide any launderable PPE.

Field Quality Control Oversight – Quality will witness vendor tests perform inspections and surveillances of construction activities.

Vendor Shop – Quality will perform vendor shop surveillances, and Source Inspections per FEMP site procedures.

Field CAT – The design specification sections provide guidance in establishing minimum field verification activities. These may be in the form of submittals, transmittals, inspections, and/or surveillances. Quality Levels will have been specified during the design phase. The QC engineers will review design drawings and specifications and identify any quality “hold-points” for the contractor. QEPs will be written for these “hold-points.” Construction acceptance testing will be performed by the contractor representative with verification and approval by Fluor Fernald.

Quality Control may require additional sub-contractor support for geo-technical, concrete, and welding acceptance testing. The QC representative is responsible for performing any quality walkdowns, documenting the results, and processing any identified deviations in accordance with the site non-conformance procedures. The quality control representative may inspect and/or accept any portion of the work at any time desired. Final quality inspections including any integrated testing will be coordinated with the contractor and construction management.

The duration of Activity Hammock No. 102504, entitled “Construction Subcontract Management” is 382 work days. It covers the duration of the Construction Contract Activities as follows:

- Contractor Mobilization – 52 workdays;
- Construction Period of Performance – 225 workdays; and
- CAT and ICAT Testing – 110 workdays.

The subcontractors will submit project schedule, pay item schedules and earned value schedules which will be incorporated into the project baseline and used as a basis for reporting progress and apportioning earned value for construction subcontract management labor.

3.2) Quantification - Construction Subcontract Management

The resources for performing Construction Management oversight are planned for in the Construction Subcontract Management, Activity Hammock, No. 102504. The resources increase to 19.7 FTEs during this timeframe and are summarized in **Table 1.5-60**. Progress reported against the contractors’ milestone schedules will be used to apportion earned value.

It is assumed that the Construction Subcontract Management labor will be required to work overtime (OT) to support the subcontractors' field activities. Based upon past experience, a 25% overtime labor factor has been assumed based on the regular work hours. Table 1.5.62 summarizes the planned overtime hours.

**TABLE 1.5-62
 CONSTRUCTION SUBCONTRACT MANAGEMENT OVERTIME SUMMARY**

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ACTIVITY NO. 102504 CONSTRUCTION SUBCONTRACT MANAGEMENT				
RESOURCE CODES	FTEs	WORK HOURS		
		REG	OT	TOTAL
CNSCOD	3.0	7,337	1,834	9,171
CNSENG	3.0	7,337	1,834	9,171
QACENG	0.5	1,125	281	1,406
QACTEC	3.8	9,196	2,299	11,495
RADTEC	5.4	13,256	3,313	16,569
S&HENG	2.5	6,114	1,529	7,643
WSTENG	1.0	2,446	612	3,058
WSTMGR	0.5	1,223	306	1,529
TOTALS	19.7	48,034	12,008	60,042

It is assumed that the Construction Subcontract Management labor will be required to work overtime (OT) to support the subcontractors' field activities. In order to provide off-shift support to the subcontractors, based upon past experience, a 10% overtime labor factor has been assumed based on the regular work hours. Table 1.5.62 summarizes the planned overtime hours.

**TABLE 1.5-62
 CONSTRUCTION SUBCONTRACT MANAGEMENT OVERTIME SUMMARY**

R1-
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ACTIVITY NO. 102504 CONSTRUCTION SUBCONTRACT MANAGEMENT				
RESOURCE CODES	FTEs	WORK HOURS		
		REG	OT	TOTAL
CNSCOD	3.0	7,337	734	8,071
CNSENG	3.0	7,337	734	8,071
QACENG	0.5	1,125	112	1,237
QACTEC	3.8	9,196	920	10,116

R1-
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ACTIVITY NO. 102504 CONSTRUCTION SUBCONTRACT MANAGEMENT				
RESOURCE CODES	FTEs	WORK HOURS		
		REG	OT	TOTAL
RADTEC	5.4	13,256	1,326	14,582
S&HENG	2.5	6,114	611	6,725
WSTENG	1.0	2,446	245	2,691
WSTMGR	0.5	1,223	122	1,345
TOTALS	19.7	48,034	4,803	52,838

1.5.5 HS1AF - Subcontracts Miscellaneous

1) Plan/Scope Subcontracts Miscellaneous

~~Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Three major subcontracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed in Sections 1.5.6, 1.5.7, and 1.5.8 of the Silos 1 and 2 Closure Plan, respectively.~~

~~This section of the Silos 1 and 2 Closure Plan discussed miscellaneous subcontracts necessary to support construction activities. It is anticipated based upon the Silos 1 and 2 construction contracting strategy, that there will be gaps in the scopes of work between the three major subcontractors, portions of the scope of work where there is a strategic advantage to have a more FEMP experienced contractor to perform the work (i.e., utility tie-ins, tie-ins to the RCS, etc.) or unique portions of the scope where directly contracting with a vendor may offer an advantage to the Silos 1 and 2 Project.~~

~~The schedule of these activities will be incorporated into the project baseline as they are identified.~~

2) ~~Quantification - Subcontracts Miscellaneous~~

~~Resources to support these activities will be managed under the Construction Management charge number HS1AD.~~

~~The contract values will be tracked and reported under charge number HS1AF.~~

F07-005

The scope of Subcontracts Miscellaneous is defined by three project tasks: Subcontracts Miscellaneous, Long Lead Procurement Items, and Advanced Construction Packages.

1) Task #1 - Subcontracts Miscellaneous

1.1) Plan/Scope - Subcontracts Miscellaneous

Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Three major subcontracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed in Sections 1.5.6, 1.5.7, and 1.5.8 of the Silos 1 and 2 Closure Plan, respectively.

This section of the Silos 1 and 2 Closure Plan discusses miscellaneous subcontracts necessary to support construction activities. Based upon the Silos 1 and 2 construction contracting strategy, it is anticipated that there will be gaps in the scopes of work between the three major subcontractors. These scopes of work are those portions where there is a strategic advantage to have a more FEMP-experienced contractor to perform the work (i.e., utility tie-ins, tie-ins to the RCS, etc.) or unique portions of the scope where directly contracting with a vendor may offer an advantage to the Silos 1 and 2 Project.

The schedule of these activities will be incorporated into the project baseline as they are identified.

1.2) Quantification - Subcontracts Miscellaneous

Resources to support these activities will be managed under the Construction Management Charge No. HS1AD. Engineering resources to support these activities will be managed under Design Charge No. HS1AC.

The contract values will be tracked and reported under Charge No. HS1AF.

F07-005

2) Task #2 - Long Lead Procurement Items

2.1) Plan/Scope - Long Lead Procurement Items

As part of the Silos 1 and 2 Preliminary Design activities, Jacobs Engineering identified a list of equipment, whose vendor specific design and performance data are critical to the completion of the Balance of Plant design and safety basis documentation. It is necessary to procure these pieces of equipment or systems well in advance of the construction of the Silos 1 and 2 Treatment and Support Facilities. **Table 1.5-62A** provides a summary of the long lead procurement equipment and systems.

The procurement package for each of these long lead procurement items will be structured in a two step format. The base contract (first step) will identify the performance requirements of the desired piece of equipment or system, and define the specific vendor data submittals (e.g., drawings, specifications, manuals) required to complete the Balance of Plant design and safety basis documentation. Each procurement package will contain a contract option (second step) for the vendor to fabricate, test, deliver, and assist with startup of each piece of equipment.

The schedule for the long lead procurement items is represented by Activity Hammock No. 101910 entitled, "Long Lead Procurement Items." The development of all the Long Lead Procurement Packages is assumed to take place following the completion of the Preliminary Design Package.

2.2) Quantification - Long Lead Procurement Items

The Jacobs Engineering labor resources for developing the performance specifications are planned under Charge No. HS1AC. The development of the procurement packages and oversight of the bid and award process are planned under Charge No. HS1AA.

Table 1.5-62A provides a summary of the long lead procurement items and their estimated costs based on vendor quotes. For resource planning purposes, it is assumed that 15% of the procurement package will be paid upon receipt of the vendor's submittals. The remaining 85% of the contract value will be paid upon completion of fabrication, testing, delivery, and startup of each piece of equipment or system.

**TABLE 1.5-62A
 SUMMARY OF LONG LEAD PROCUREMENT ITEMS**

07-005

PROCUREMENT PACKAGE	EQUIPMENT NAME	TYPE	QUANTITY	UNIT COST	EXTENDED COST
1	Clean Area Filter Housing	Prefilter and HEPAs	1	\$80,000	\$80,000
	Clean Area Filter Housing	Prefilter and HEPAs	1	\$80,000	\$80,000
	Contaminated Area Filter Housing	Prefilter and HEPAs	1	\$80,000	\$80,000
	Contaminated Area Filter Housing	Prefilter and HEPAs	1	\$80,000	\$80,000
	Contaminated Area Filter Housing	Prefilter and HEPAs	1	\$80,000	\$80,000
2	Clarifier Mixer	Mixer with Motor	1	\$77,000	\$77,000
	Flocculator	Vertical Tank	1	\$10,500	\$10,500
	Clarifier	Gravity Separator	1	\$74,000	\$74,000
3	Liquid Waste Tank	Vertical Tank	1	\$250,000	\$250,000
	Slurry Receipt Tank	Vertical Tank	3	\$250,000	\$750,000
	Slurry Feed Tank	Vertical Tank	3	\$28,000	\$84,000
	Clarifier Tank	Vertical Tank	1	\$250,000	\$250,000
4	Product Mixers	Horizontal Ribbon Blender	3	\$280,000	\$840,000
5	PLC/HMI Programming		1	\$500,000	\$500,000
	PLC Cabinets			-	-
6	Pre-engineered Building	Electrical Building	1	\$185,000	\$185,000
SUBTOTAL LONG LEAD PROCUREMENT COST					\$3,420,500
SALES TAX (6%)					\$205,230
TOTAL					\$3,625,730

3) Task #3 - Advanced Construction Packages

Advanced Construction Packages will be identified as part of the FEMP and Silos 1 and 2 construction execution strategy. These packages will be logically separated from the main construction packages (Sections 1.5.6, 1.5.7, and 1.5.8). Early execution of these packages will offer funding and schedule advantages.

3.1) Road Access and Trailer Staging Area

3.1)1 Plan/Scope - Road Access and Trailer Staging Area

As discussed in Section 1.4, the Silos 1 and 2 Project will improve the FEMP roadway infrastructure and truck trailer staging area to support the Silos 1 and 2 Waste Shipping Program. The engineering and design will be developed by Jacobs Engineering as part of the Silos 1 and 2 Design activities. This package will then be issued as a separate procurement activity from the civil, mechanical, and electrical packages.

F07-005

As part of the FEMP sitewide funding strategy, the road access and trailer staging area contract will be incrementally funded. The contractor will be required to submit a funding profile to Fluor Fernald for approval. The profile will be based upon the construction schedule and identify the contractor's funding needs on a fiscal year basis.

3.1)2 Quantification - Road Access and Trailer Staging Area

The resources for developing the access road and trailer staging area design are planned under Charge No. HS1AC. The management and oversight of the procurement activities is planned under Charge No. HS1AA. The estimated cost of the Silos 1 and 2 Access Road and Trailer Staging Area contract is \$1,512,000. The value of the contract will be reported under Charge No. HS1AF.

3.2) Other Advanced Construction Packages

3.2)1 Plan/Scope - Other Advanced Construction Packages

The scope of additional construction packages will be included in this section as they are identified.

3.2)2 Quantification - Other Advanced Construction Packages

The resources for additional construction packages will be included in this section as they are identified.

~~1.5.6 HS1AG - Electrical Subcontract~~

~~1) Plan/Scope - Electrical Subcontract~~

~~Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTG labor in accordance with the FEMP Project Labor Agreement. Three major contracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed here and in Sections 1.5.7 and 1.5.8.~~

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~~Fluor Fernald will prepare an IFB package that will describe the scope, terms, and conditions for completing the electrical scope of work.~~

~~The schedule for performing the electrical contract is summarized by Activity Hammock No. 121855. The electrical contractor will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the Silos 1 and 2 Project baseline. The overall duration of the construction schedule will be 225 workdays.~~

~~2) Quantification - Electrical Subcontract~~

~~The Silos 1 and 2 Project team and all Fluor Fernald labor support of the electrical contract is planned in Section 1.5.4, under charge number, HS1AD.~~

~~The only resources that will be tracked and reported under charge number HS1AG, is the value of the electrical contract.~~

~~1.5.7 HS1AH Mechanical Subcontract~~

~~1) Plan/Scope Mechanical Subcontract~~

~~Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Three major contracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed here and in Sections 1.5.6 and 1.5.8.~~

R1-
F07-
033

~~Fluor Fernald will prepare an IFB package that will describe the scope, terms, and conditions for completing the mechanical scope of work.~~

~~The schedule for performing the mechanical contract is summarized by Activity Hammeck No. 121455. The mechanical contractor will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the Silos 1 and 2 Project baseline. The overall duration of the construction schedule will be 225 workdays.~~

~~2) Quantification Mechanical Subcontract~~

~~The Silos 1 and 2 Project team and all Fluor Fernald labor support of the mechanical contract is planned in Section 1.5.4, under charge number, HS1AD.~~

~~The only resources that will be tracked and reported under charge number HS1AH, is the value of the mechanical contract.~~

~~1.5.8 HS1AJ Civil Subcontract~~

~~1) Plan/Scope Civil Subcontract~~

~~Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Three major contracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed here and in Sections 1.5.6 and 1.5.7.~~

~~Fluor Fernald will prepare an IFB package that will describe the scope, terms, and conditions for completing the civil scope of work.~~

~~The schedule for performing the civil contract is summarized by Activity Hammeck No. 121170. The civil contractor will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the Silos 1 and 2 Project baseline. The overall duration of the construction schedule will be 225 workdays.~~

~~2) Quantification - Civil Subcontract~~

~~The Silos 1 and 2 Project team and all Fluor Fernald labor support of the civil contract is planned in Section 1.5.4, under charge number, HS1AD.~~

~~The only resources that will be tracked and reported under charge number HS1AJ, is the value of the civil contract.~~

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033

1.5.6 HS1AG - Electrical Subcontract

1) Plan/Scope - Electrical Subcontract

Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Three major subcontracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed here and in Sections 1.5.7 and 1.5.8.

Fluor Fernald will prepare an IFB package that will describe the scope, terms, and conditions for completing the electrical scope of work.

As part of the FEMP sitewide funding strategy, the electrical subcontract will be incrementally funded. The electrical subcontractor will be required to submit a funding profile to Fluor Fernald for approval. The profile will be based upon the construction schedule and identify the subcontractor's funding needs on a fiscal year basis.

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The schedule for performing the electrical subcontract is summarized by Activity Hammock No. 121855. The electrical subcontractor will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the Silos 1 and 2 Project baseline. The overall duration of the construction schedule will be 225 workdays.

2) Quantification - Electrical Subcontract

The Silos 1 and 2 Project Construction Team and all Fluor Fernald labor support of the electrical subcontract is planned under Construction Management, Charge No. HS1AD (Table 1.5-60).

F07-001

~~The basis of the capital cost estimate for the Silos 1 and 2 electrical subcontract is provided in Appendix B.~~ The cost estimates are found in Section 4 of this Closure Plan. The value of the electrical subcontract is \$7,981,557. The electrical subcontract is the only resource that will be tracked and reported under Charge No. HS1AG. Table 1.5-62B summarizes the cost estimate for the Electrical Construction Package for the Silos 1 and 2 Project.

**TABLE 1.5-62B
 SILOS 1 AND 2 CONSTRUCTION PACKAGE COST SUMMARY**

COST ELEMENT	CONSTRUCTION PACKAGE			TOTALS
	CIVIL	MECHANICAL	ELECTRICAL	
Mobilization	\$19,470	\$19,470	\$19,470	\$58,410
Civil and Excavation	\$303,820	-	-	\$303,820
Concrete (all facilities)	\$3,197,200	-	-	\$3,197,200
Structural Steel (all facilities)	\$1,243,300	-	-	\$1,243,300
Architectural (all facilities)	\$1,938,300	-	-	\$1,938,300
Equipment Systems	-	\$7,434,607	-	\$7,434,607
Piping	-	\$880,700	-	\$880,700
Electrical	-	-	\$2,140,200	\$2,140,200
Instrumentation	-	-	\$2,573,349	\$2,573,349
Paint	\$413,300	-	-	\$413,300
Subtotal Direct Costs	\$7,115,390	\$8,334,777	\$4,733,019	\$20,183,186
Percent Total Direct Costs	35.3	41.3	23.4	100
Subtotal Indirect Costs	\$5,700,103	\$6,668,959	\$3,778,538	\$16,147,600
Subtotal Project Costs	\$12,815,493	\$15,003,736	\$8,511,557	\$36,330,786
Less Long Lead Procurement Items	\$196,100	\$2,899,630	\$530,000	\$3,625,730
Total Package Costs	\$12,619,393	\$12,104,106	\$7,981,557	\$32,705,056

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1.5.7 HS1AH - Mechanical Subcontract

1) Plan/Scope - Mechanical Subcontract

Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Three major subcontracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed here and in Sections 1.5.6 and 1.5.8.

Fluor Fernald will prepare an IFB package that will describe the scope, terms, and conditions for completing the mechanical scope of work.

As part of the FEMP sitewide funding strategy, the mechanical subcontract will be incrementally funded. The mechanical subcontractor will be required to submit a funding profile to Fluor Fernald. The profile will be based upon the construction schedule and identify the subcontractor's funding needs on a fiscal year basis.

R1-
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033

The schedule for performing the mechanical subcontract is summarized by Activity Hammock No. 121455. The mechanical subcontractor will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the Silos 1 and 2 Project baseline. The overall duration of the construction schedule will be 225 workdays.

2) Quantification - Mechanical Subcontract

The Silos 1 and 2 Project Construction Team and all Fluor Fernald labor support of the mechanical subcontract is planned under Construction Management, Charge No. HS1AD (Table 1.5-60).

F07-001

~~The basis of the capital cost estimate for the Silos 1 and 2 mechanical subcontract is provided in Appendix B.~~ The cost estimates are found in Section 4 of this Closure Plan. The value of the mechanical subcontract is \$12,104,106. The mechanical subcontract is the only resource that will be tracked and reported under Charge No. HS1AH. Table 1.5-62B summarizes the cost estimate for the Mechanical Construction Package for the Silos 1 and 2 Project.

1.5.8 HS1AJ - Civil Subcontract

1) Plan/Scope - Civil Subcontract

Consistent with the Silos 1 and 2 Contracting Strategy, the construction of the Silos 1 and 2 remediation and support facilities will be performed by subcontractors using GCBCTC labor in accordance with the FEMP Project Labor Agreement. Three major subcontracts will be awarded for electrical, mechanical, and civil work. For progress reporting purposes, these subcontracts will be tracked under separate charge numbers as discussed here and in Sections 1.5.6 and 1.5.7.

Fluor Fernald will prepare an IFB package that will describe the scope, terms, and conditions for completing the civil scope of work.

As part of the FEMP sitewide funding strategy, the civil subcontract will be incrementally funded. The civil subcontractor will be required to submit a funding profile to Fluor Fernald. The profile will be based upon the construction schedule and identify the subcontractor's funding needs on a fiscal year basis.

The schedule for performing the civil subcontract is summarized by Activity Hammock No. 121170. The civil subcontractor will submit a detailed project schedule and pay item schedule, which upon approval by Fluor Fernald, will be incorporated into the Silos 1 and 2 Project baseline. The overall duration of the construction schedule will be 225 workdays.

2) Quantification - Civil Subcontract

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033

The Silos 1 and 2 Project Construction Team and all Fluor Fernald labor support of the civil subcontract is planned under Construction Management, Charge No. HS1AD (Table 1.5-60).

F07-001

~~The basis of the capital cost estimate for the Silos 1 and 2 civil subcontract is provided in Appendix B.~~ The cost estimates are found in Section 4 of this Closure Plan. The value of the civil subcontract is \$12,619,393. The civil subcontract is the only resource that will be tracked and reported under Charge No. HS1AJ. Table 1.5-62B summarizes the cost estimate for the Civil Construction Package for the Silos 1 and 2 Project.

1.5.2 HS1AK - Startup and Readiness

Startup and Readiness ensures that the facility and personnel are prepared to operate safely and effectively. The startup and readiness activities include project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design bases.

Additionally, Fluor Fernald will complete an evaluation of operational readiness consistent with site requirements. Subsequent to satisfactory completion of Fluor Fernald's readiness evaluation, DOE-FEMP will complete its readiness evaluation per DOE Orders, as applicable. Fluor Fernald will provide support to DOE as needed.

The scope, schedule and resources for the Startup and Readiness activities will be managed by the following five (5) key activities:

- Startup management;
- O&M Procedures Development;
- Training;
- SOT; and
- Pre-Operational Readiness Review.

The schedule for all the Startup and Readiness is summarized under the Activity Hammock No. 100010. The O&M labor resources are managed and reported under charge number HS1AL. The startup management resources will be managed and reported under charge number HS1AK. The following sections describe the scope, schedule and planned resources for these key activities.

1) Task #1 - Startup Management

1.1) Plan/Scope - Startup Management

Startup management includes the oversight and overall planning for startup activities. Fluor Fernald will prepare a CONOPs matrix to define the extent to which CONOPs guidelines will be applied. CONOPs documents the activities in the following key areas integral to operations: operations organization and administration, work force planning, operating practices and shift routines; control area activities, communications, on-shift training, investigation of off-normal events, notifications, control of equipment and system status, lockout/tagout, independent verification, log keeping, shift turnover, required reading, orders to operators, operational procedures, operator aids, and equipment and piping labeling. Standing orders will be prepared to implement these CONOPs requirements.

Startup management also includes management activities to ensure that the project is ready for operations, such as preparing project files for start-up review and conducting self-assessments. The type of review required for this project will be determined based on the approved hazard category. The Fluor Fernald Silos 1 and 2 Project team and/or Fluor Fernald Readiness Team will then develop and implement a Readiness Plan of Action (POA) and a Readiness Implementation Plan (RIP), as appropriate.

This hammock activity begins with the early stages of training development (Activity No. 100010) and lasts until DOE has provided authorization to operate the Silos 1 and 2 treatment facilities (Activity No. 102900). The performance credited under the Startup Management activity will be apportioned based on progress taken for the other activity under this charge number.

1.2) Quantification - Startup Management

Fluor Fernald technical support, project management, and oversight are planned under Project Management, Charge No. HS1AA. The project-specific resources planned under this activity as summarized in **Table 1.5-63**.

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**TABLE 1.5-63
 RESOURCE SUMMARY FOR STARTUP MANAGEMENT**

RESOURCE CODE	ACTIVITY NO. 100010 TOTAL RESOURCES (FTE)			
	FY-03	FY-04	FY-05	FY-06
CLERKS	0.25	1.00	1.00	-
S&HENG	0.125	0.50	0.50	-
TPSREP	-	1.25	2.00	1.00
QACENG	0.50	1.00	1.00	0.75
QACTEC	0.25	1.00	1.00	0.75

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**TABLE 1.5-63
 RESOURCE SUMMARY FOR STARTUP MANAGEMENT - ACTIVITY NO. 100010**

Resource	FY-03		FY-04				FY-05				FY-06		
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
QACENG				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
QACTEC	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
S&HENG		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
TPSREP							1.0	1.0	1.0	1.0	1.0	1.0	1.0
TPSREP					1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Service Contract (\$160,000/yr)	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K	40K

2) Task #2 - Operations and Maintenance Procedures Development

2.1) Subtask #1 - Operations

2.1)1 Plan/Scope - Operations

Operating procedures will be developed by Fluor Fernald to direct personnel in the safe operation of the Silos 1 and 2 treatment systems and equipment during normal, off-normal, and emergency conditions. Existing Fluor Fernald operating procedures will be used by the Fluor Fernald labor force in performing routine Hazardous Waste Material Transportation Technician and Hazardous Waste Technician operations. It is assumed that operating procedures will be developed for the following activities:

- Operation of the RCS;
- Operation of the Waste Transfer System;
- Operation of the High Efficiency Particulate Air (HEPA) ventilation system;
- Operation of the Wastewater system;
- Operation of the Treatment System/Conveyors/Additive system;
- Operation of Breathing Air System;
- Operation of closed circuit television (CCTV) system;
- Loading of containers (preparation, inspection, filling, closing);
- Transport of containers to loading facility;
- Movement of truck trailers;
- Emergency Operating Procedures;
- System Shut-down (short-duration); and
- Decontamination (including tools and equipment).

Operating procedures will be drafted and reviewed prior to start of SOTs. However, procedures will not be finalized until SOTs have been completed, and lessons learned from SOT can be incorporated into the procedures. The schedule for preparation of the operating procedures is summarized by the activities in **Table 1.5-64**. All activities are assumed to have a "finish to start" relationship. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

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**TABLE 1.5-64
 OPERATING PROCEDURES SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
102404	Operating Procedures (Hammock)	60	-
102408	Prepare Operating Procedures (13 total)	25	5% per procedures drafted (65% max)
102412	Fluor Fernald Review Operating Procedures	10	-
102416	Incorporate Comments and revise	20	1% per procedure reviewed and revised
102420	Approve Operating Procedures	5	100%

The T&QP prepared for the Silos 1 and 2 Project will be updated annually to reflect the project-specific training that will be required for operators, supervisors, and support personnel who will be implementing the remedial action (**Section 1.5.1.2.2**). Based on the revised T&QP, lesson plans and briefings, will be developed for project-specific training. Training will be performance-based, focused on training personnel to perform tasks, not procedure-specific. It is assumed that the following training courses will be developed:

- Treatment System/Additive operation;
- Waste transfer operation;
- RCS operation;
- HEPA ventilation system operation;
- Wastewater operations;
- Air-supplied respirator operation;
- Breathing air system operation;
- CCTV system operation;
- Packaging;
- Emergency response;
- Standing Orders; and
- Safety Basis.

The schedule for preparation of the lesson plans is summarized by the activities in **Table 1.5-67**. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity. Because some activities may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken.

**TABLE 1.5-67
 DEVELOP TRAINING SCHEDULE**

ACTIVITY NO	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113004	Operations Training Lesson Plans (Hammock)	70	-
113008	Prepare Operations Training Plans (12 total)	25	3%/plan (36% total)
113012	Review Operations Training Plans (12 total)	20	2%/plan (24% total)
113016	Finalize Lesson Plans (12 total)	20	2%/plan (24% total)
113020	FF Approve Lesson Plan/Briefing (12 total)	5	100%

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3.1)2 Quantification - Develop Training

The resources for the preparation of the training program are planned under Charge No. HS1AL

3.2) Subtask #2 - Conduct Training

3.2)1 Plan/Scope - Conduct Training

Training courses will be developed and administered by Fluor Fernald to train personnel to a level commensurate with their job duties and responsibilities. Training will provide the worker with the knowledge of the processes, procedures, tools, and safety measures required to ensure the safety of personnel, property, the public, and the environment. Based on the revised T&QP, lesson plans and briefings will be developed for project-specific training. Training will be performance-based, focused on training personnel to perform tasks, not procedure-specific. Training will consist of classroom training, table-top exercises, and on-the-job training, as appropriate.

It is assumed that classroom training and on the job training (OJT) will be required for all the courses identified, with the exception that classroom training only will be required for the following training courses in order to obtain qualification:

- Standing Orders; and
- Safety Basis.

The schedule for training is summarized by the activities in **Table 1.5-68**. Because several activities may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken. This schedule does not include OJT that is accomplished during SOT.

**TABLE 1.5-68
 TRAINING SCHEDULE SUMMARY**

R1- F07- 039	ACTIVITY	DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
			Conduct Training (Hammock)	20
	113001 & 113090	Conduct classroom training (12 courses total) OJT	20	8% per plan completed (96% max)
		All Complete		100%

**TABLE 1-5-68
 TRAINING SCHEDULE SUMMARY**

R1- F07- 039	ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
		113000	Training Development(Hammock)	493
	113001	Conduct training (12 courses total)	175	8% per plan completed (96% max)
		All Complete		100%

3.2)2 Quantification - Conduct Training

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The resources to conduct training are planned under Charge No. HS1AL.

4) Task #4 - System Operability Testing

System Operability Testing involves the following activities:

- 1) SOT Plan and Procedures;
- 2) SOTs; and
- 3) System Operability Final Test Report.

4.1) Subtask #1 - SOT Plan and Procedures

4.1)1 Plan/Scope - SOT Plan and Procedures

Fluor Fernald will develop a SOT Plan to establish the testing program for Silos 1 and 2 startup. Fluor Fernald will also develop SOT procedures on equipment in the following systems, identifying personnel, testing requirements, system boundaries and standards to be met to ensure that the Silos 1 and 2 system meets the design requirements.

- Waste Transfer system;
- Wastewater system;
- Batch mixing and filling system;
- HEPA and RCS; and
- Breathing Air system.

The performance schedule for preparation of the SOT procedures is summarized by the activities in **Table 1.5-69**. Because several procedures may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity until 100% cumulative progress has been taken.

**TABLE 1.5-69
 SYSTEM OPERABILITY TESTING PROCEDURES SCHEDULE SUMMARY**

ACTIVITY NO	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113330	SOT Procedures (Hammock)	55	--
113334	Prepare Draft SOT Procedures (5 total)	20	10% per plan completed (50% max)
113338	Fluor Fernald Review and comment	20	4% per plan completed (20% max)
113342	Finalize SOT Procedures	10	4% per plan completed (20% max)
113346	Approve/Accept SOT Procedures	5	2% per plan completed (10% max)

4.1)2 Quantification - SOT Plan and Procedures

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The resources for the preparation of the SOT Plan and Procedures are planned under Charge No. HS1AL.

4.2) Subtask #2 - SOTs

4.2)1 Plan/Scope - SOTs

System Operability Testing will be performed by Fluor Fernald to verify process design, proper construction, and that the systems are operational in accordance with the applicable functional facility requirements. Successful completion of SOTs will document the formalized process by which the Silos 1 and 2 facility can be turned over to operations having verified that each Silo 1 and two (2) structures, systems, or components can be operated in a manner that is safe to personnel, equipment, and environment.

SOTs will be performed on equipment in the following systems. A physical surrogate will be used to test equipment during SOT.

- Waste transfer system;
- Wastewater system;

- Batch mixing and filling system;
- HEPA and RCS; and
- Breathing air system.

OJT for the following training classes will be accomplished during SOT:

- Treatment system/Additive operation;
- Waste transfer operation;
- RCS operation;
- HEPA ventilation system operation;
- Wastewater operation;
- Breathing air system operation;
- Air-supplied respirator operation;
- CCTV system operation;
- Packaging; and
- Emergency response.

4.2)2. Quantification - SOTs

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The resources for conducting SOTs are planned under Charge No. HS1AL.

4.3) Subtask #3 - System Operability Final Test Report

4.3)1 Plan/Scope - System Operability Final Test Report

Fluor Fernald will prepare a Final Test Report when all sections of the SOT Procedure(s) and identified retests are complete. The Final Test Report will contain the following information:

- Form FS-F-3982;
- Explanations of Test Exceptions;
- Test Procedure Change Notices;
- System modifications;
- Corrective actions;
- DCNs;
- Comparison of the test data with the acceptance criteria; and
- Conclusion regarding acceptance of facility/process.

The performance schedule for conducting system operability testing and completing the test report is summarized by the activities in Table 1.5-70. Because several procedures may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken.

**TABLE 1.5-70
 SYSTEM OPERABILITY TESTING SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
100900	SOT Procedures (hammock)	90	-
1130901 & 113110	Conduct SOT Procedures (5 total)	70	17% per Procedure completed (85% maximum)
113390	Complete SOT Report	20	15%

4.3)2 Quantification - System Operability Final Test Report

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The resources for the preparation of the System Operability Final Test Report are planned under Charge No. HS1AL.

5) Task #5 - Pre-Operational Assessment Program

5.1) Subtask #1 - Project Readiness Verification and Self-Assessment Team

5.1)1 Plan/Scope - Project Readiness Verification and Self-Assessment Team

The Project Readiness Team will ensure that the facility and personnel are prepared to operate safely and effectively. The Project Readiness Team will use a graded approach to verify the following five (5) areas are satisfactory to commence operations from site requirements:

- **Hardware and Systems** - Procedures and controls for operating the process systems and utility systems are correct and adequate. Project safety documentation is in place that describes the safety envelope and implements adequate and safe controls. Structures, systems and components are operable and in satisfactory condition as defined in the project plans and safety requirements.
- **Personnel and Organization** - Training and qualification programs for operations and operations support personnel have been established, documented, and implemented. There are sufficient numbers of qualified personnel to support safe operations. A routine emergency operations drill program including program records, has been developed, established, and implemented. Technical management qualification of personnel responsible for facility operations are adequate. Level of knowledge of operations and operations support personnel is adequate. Personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements, and through their actions, demonstrate a high priority commitment to comply with these requirements. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management for control of safety. The formality and discipline of operations are adequate to work safely.
- **Management Programs** - A process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, review teams, and audit organizations. A systematic review of the facility's conformance to applicable DOE Orders has been performed. Functional areas programs such as Maintenance, Radiological Protection, Industrial Safety and Health, and Quality Assurance are adequate to support project.
- **Operating Procedures** - Procedures necessary for operation have been identified, prepared, and approved. Operational constraints, terms, and conditions or limiting conditions (if any) are identified in operating procedures or other documents. Workability and completeness of procedures have been verified in the field. Procedures are controlled and have been distributed and made available to workers.

- Support Organizations - Training and qualification programs that cover the entire range of duties for operations support personnel have been established, documented, and implemented. Level of knowledge of support personnel is adequate based upon reviews of test results, personnel interviews, and observation of work practices.

Fluor Fernald will develop a readiness plan for the Silos 1 and 2 Project. The Fluor Fernald Silos 1 and 2 Project team and/or Fluor Fernald Readiness Team will then develop and implement a POA and a RIP, as appropriate. At this time, it is expected that an ORR will be required for the Silo 1 and 2 Project.

5.2) Subtask # 2 - Fluor Fernald Operational Readiness Review

5.2)1 Plan/Scope - Fluor Fernald Operational Readiness Review

An ORR is an independent, disciplined, systematic, documented, performance-based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that an activity will be operated safely within its approved safety envelope as defined by the Silos 1 and 2 safety basis. The ORR will base its scope on the relationship of the Silos 1 and 2 remediation activity to a minimum set of core requirements defined in site procedure and DOE orders. A graded approach will be used to define the depth of the ORR based on these core requirements.

The facility/system start-up authority is a function of the final hazard categorization of the facility. For facilities that are HC 1 and HC 2, the DOE Ohio Field Office (DOE-OFO) has startup authority. For HC 3 facilities, such as the Silos 1 and 2 remediation facilities, the DOE-FEMP has startup authority. For radiological or other industrial hazard (OIH) and standard industrial hazards (SIH), Fluor Fernald has been delegated startup authority.

The schedule for conducting the ORR is summarized by the activities in Table 1.5-71. All activities are assumed to have a "finish to start" relationship. Progress on key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity. Milestone percent completes indicated are cumulative.

**TABLE 1.5-71
 ORR SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
104890	Silos 1 and 2 ORRs (Hammock)	99	-
104898	Declaration of Readiness	30	33%
106002	Complete Fluor Fernald ORR	32	70%
106022	Complete DOE ORR	31	100%

5.2)2 Quantification - Fluor Fernald Operational Readiness Review

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The resources for supporting the Silos 1 and 2 ORR are planned under the Activity Hammock No. 104885 ~~100010~~.

~~1.5.10~~ HS1AL - Operations and Maintenance

Scope

~~As part of the Silos 1 and 2 remedial actions the following operation and maintenance activities will be performed:~~

- ~~• Waste Transfer (from the TTA Tanks) and Treatment; and~~
- ~~• RCS and TTA Operations.~~

~~The scope, schedule, and resources for these actions will be managed under the Activity No. 101000, entitled, "Operations." The resources will be managed and reported under charge number HS1AL. Earned value will be determined based on the quantity of Silos 1 and 2 material removed from the TTA tanks. Each of the four (4) TTA tanks will represent 25% of the volume of Silos 1 and 2 material to be treated. A monthly determination of the volume of waste treated from an individual tank will be calculated using the combination of the tanks' level indicator readings and visual inspection by remote camera. The following sections describe the scope of the operations and maintenance activities.~~

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~~1)~~ Task #1 - Waste Transfer and Treatment Process

~~1.1)~~ Plan/Scope - Waste Transfer and Treatment Process

Waste Transfer

~~Upon completion of the AWR Project, responsibility for the maintenance of the TTA facility will be transferred to the Silos 1 and 2 Project. The Silos 1 and 2 Project will have to maintain the TTA facilities in a standby mode, until it is placed into operations as part of the Silos 1 and 2 Project.~~

~~The Silos 1 and 2 material will have been staged in the TTA for a while before retrieval operations by the TTA Waste Retrieval System (TWRS). The TWRS is an existing facility that will allow for access, mobilization, and removal of the material from the interior of the TTA tanks. The Silos 1 and 2 Project will tie in at flanged connections and provide all piping and equipment that is required to interface with the TWRS. The TWRS retrieval equipment will have the capacity of transferring approximately 5,900 lb/hr of solids to the Silos 1 and 2 Remediation Facility.~~

~~In addition to the existing equipment, the TWRS will include the facilities and equipment to recycle, to the extent practical, any water removed from the transferred slurry. The existing TTA facility will include the Ultra Filtration System as well as the associated filtrate storage tank and filter process tank, each having a storage capacity of 7,500 gallons.~~

~~Once the Silos 1 and 2 material is mobilized in the TTA tanks, it will be transferred to one of several slurry receipt tanks—the entry point of the treatment process. All material must be removed from the TTA tanks, leaving the interior surface of the tanks “visibly free” of material.~~

~~The Silos 1 and 2 treatment process will chemically stabilize the untreated Silos 1 and 2 material to produce a final waste form that meets the TCLP test for metals and meets the NTS WAC. The treatment process begins with the transfer of the Silos 1 and 2 material from the TTA tanks to the slurry receipt tanks. The slurry is then pumped to a mixing tank where a flocculating agent is added and any pH adjustments can be made. The slurry waste overflows to a clarifier where the waste is settled up to 30 wt% solids. At the clarifier, the supernatant is recycled back to the TTA while the 30 wt% solids underflow is pumped to one of three the slurry feed tanks.~~

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~~The waste in the slurry feed tanks is then pumped to the high sheer mixer. The mixer is located upon a loadcell weighing system, which ensures the proper amount of Silos 1 and 2 material is metered into the mixer. The chemical stabilization treatment formulation requires that proper portions of stabilizing additives (i.e., triple super phosphate, cement, and flyash) are added to the mixer. After the Silos 1 and 2 material and the chemical additives are thoroughly mixed, the “batch” of treated material is discharged directly into the disposal containers. The volume of each batch is capable of filling one (1) disposal container. During each 24 hour operational period, an average of 24 batches can be processed. A total of 6,000 batches will be required to process all of the Silos 1 and 2 material.~~

~~While each batch is being discharged to the containers, a sample from every other batch will be collected. After each batch of waste has been discharged to the containers, a lid will be placed and secured on the containers. The sealed waste containers will be conveyed to an area where their exterior surfaces are surveyed and decontaminated as necessary. The containers are then released for shipment and transferred to the Silos 1 and 2 shipping area, to be staged for transport to the NTS. The loading and transportation of the packaged waste to the NTS is discussed in Section 1.5.11 of this closure plan.~~

Samples

~~A sample from every other batch will be collected in reusable trays, having 9mm pellet molds. At the end of the day, a sample split from each batch will be archived and the other half will be composited with sample splits from each of the other batches. Each composited sample will represent the population of treated waste containers from that day's production. A portion of the composited sample will be submitted to the laboratory for verification of compliance with the NTS WAC. An estimated 3,000 samples will be collected, and an estimated 250 composited samples will be tested for compliance with the NTS WAC (Table 1.5-80, Item 6).~~

~~In addition, all wastewater will be collected in a holding tank and sampled for compliance with the FEMP AWWT waste acceptance criteria prior to transfer. The wastewater samples will be analyzed for Total Dissolved Solids, Total Suspended Solids, pH, radiological and TCLP metals. It is estimated that up to 1,000 gallons of wastewater could be generated on a weekly basis from the treatment process, from routine equipment flushing and washdown activities. Samples will be collected weekly prior to transfer to the AWWT. An estimated 60 samples will be collected throughout the operations period (Table 1.5-80, Item 7).~~

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~~In order to demonstrate compliance with regulatory air emission requirements, the Silos 1 and 2 stack emissions, will be monitored. Routine samples will be collected on a bi-weekly basis and submitted to an offsite third party laboratory for analysis (Table 1.5-80, Item 8).~~

~~Throughout the duration of the O&M activities, routine process sampling of the three (3) slurry feed tank contents will be performed on a daily basis. Samples will be analyzed for moisture content, so that any required treatment formulation adjustments can be made prior to processing each tank. The required turnaround time for this analytical procedure is 2 to 4 hours. An estimated 1200 samples will be collected. In addition, a weekly sample will be processed for lead, using inductively coupled plasma mass spectrometer (ICP-MS) analysis (Table 1.5-80, Item 9).~~

~~Through the duration of the O&M activities, routine sampling will also be performed by FEMP's Health and Safety Department to verify that the workers' environment is in compliance with Occupational Safety and Health Administration (OSHA) standards. These samples will be collected periodically and sent to an offsite third party laboratory for analysis (Table 1.5-80, Item 10).~~

Off Specification Waste

For the purpose of establishing the technical baseline, it is assumed that 1% of all the Silos 1 and 2 treated material (60 containers) will fail the NTS WAC. The Silos 1 and 2 treatment process has been designed without the capability of reworking any treated Silos 1 and 2 material that fails to meet the NTS WAC. The project has assumed that it will identify an alternative disposal method (i.e., macroencapsulation) and/or location to address this situation. If the project team does not identify an alternative disposal solution to reworking the off specification treated waste, then the project will design and construct a rework process. This issue has been identified in the Silos 1 and 2 Project Risk Management Plan.

O&M Schedule

The Silos 1 and 2 Project cannot begin operations until Fluor Fernald receives authority from DOE to operate following completion of the ORR process. The total duration of the Silos 1 and 2 operations and maintenance activities is one (1) year or 365 calendar days. For resource planning, the assumed availability (uptime) of the plant is 70%; however, it will be designed and constructed for 100% availability. Therefore, only 250 days of uptime would be required to treat all of the Silos 1 and 2 material. The manpower planning for the O&M activities is based upon a continuous operations schedule of two (2) 12-hour shifts/day, 24 hours/day, 7 days/week, 52 weeks/year for one (1) year.

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1.2) Quantification Waste Transfer and Treatment Process

The responsibilities of the Silos 1 and 2 O&M support is summarized in Table 1.5-72 into the following functional areas:

**TABLE 1.5-72
O&M SUPPORT**

FACILITY OPERATIONS	OPERATIONS PLANNING
Maintain Collective Status of Operations	Operations T&QP
Plant operation, control of equipment, and equipment status	T&QP Coordination and Administration
Support Performance of SOTs	Procedure and Document Preparation
Validate Standard Operating Procedures (SOPs)	Readiness Documentation Preparation
Plant operation during startup	Performance Measures
	Operations Schedules
FACILITY OWNER	FIELD ENGINEERING
Lock & Tag Program Technical Rep.	Technical support to Project Operations during startup and waste operations
Construction interface	Technical support to Maintenance Staff
AWWT/UE interface	Field alteration USQD Screening
Site support Coordination	Operational Contingency Planning
Analytical Lab Coordination	Configuration Management
Overtime lists	

FACILITY OWNERSHIP (CONT'D)	MAINTENANCE
Laber issues	Corrective Maintenance and Preventative Maintenance
Routine groundskeeping activities	Overtime tracking
Perform daily walkthroughs and inspections	Resource Management
Provide materials and perform maintenance	Stores/Spare Parts/Tools, etc.
Provide for rental equipment and contracted services	Programmatic Maintenance Support
Perform waste/storage/handling/transfer activities as necessary	
Implement and update the K65 Emergency Dome Failure Recovery Plan	
Provide Silos Project integration effort with site in regard to utilization	
Water transfer activities from Pilot Plant, K65 trench, Decant Sump Tank	
Maintain the Decant Sump and pump (as needed)	
Maintain existing fencing and radiological postings/signs/ropec	
Area access control	
Preventative maintenance as required	
Honeywell support	
Miscellaneous PPE	
Bottled water	
General Housekeeping	
Silt fencing installation and maintenance	
Equipment calibration	
Dumpsters and miscellaneous containers (55 gallon drums)	
Personnel moves and relocations	

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To facilitate manpower planning, the O&M personnel have been organized into the following work crews based on major functional areas:

<u>Crew Area (ID)</u>	<u>Responsibilities</u>
Control Room (CR)	CR Operations/Plant Coordination
Process Plant Area (PPA)	PPA and Equipment
Transfer Tank Area (TTA)	TTA Area and Equipment Operation
Shift Maintenance (MAINT)	Silos 1 and 2 Remediation Facilities
Centralized Maintenance Services (CMS)	As Needed Maintenance Support
Support Staff	O&M/Waste Operations Support

The following ~~Table 1.5-73~~ summarizes the shift coverage for the Silos 1 and 2 O&M crews. By working two (2) 12-hour shifts/day, 4-day rotations, there is a need to have two (2) day shifts and two (2) complimentary night shifts for the CR and PPA crews. The transfer of Silos 1 and 2 material from the TTA will be conducted on a single 12-hour shift/day, 4-day rotation, therefore, two (2) day shift TTA crews are required.

The maintenance activities will be performed on a single day shift and night shift basis. Maintenance crews will work a standard 10-hour shift/day, 4-days/week.

**TABLE 1.5-73
 SHIFT COVERAGE SUMMARY**

SHIFT	SHIFT COVERAGE (NO. CREWS)				
	CR/PPA	TTA	MAINT	SS	GMS
DAY	2	2	1	1	1
NIGHT	2	-	1	-	-

Based upon the work crew designations and the operations work schedule, a manpower staffing plan has been developed to ensure that all plant operations are adequately staffed. The following ~~Tables 1.5-74 through 1.5-77~~ summarize the Silos 1 and 2 O&M staffing plan by work crew.

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**TABLE 1.5-74
 CR/PPA CREW SUMMARY**

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)						
		OPRMGR	ENGPRC	CHMOPR	HEOOPR	RADTEC	S&HENG	INHTEC
DAY	A1	2	1	5	1	3	1	1
DAY	A2	2	1	5	1	3	1	1
NIGHT	B1	2	1	5	1	3	1	1
NIGHT	B2	2	1	5	1	3	1	1

**TABLE 1.5-75
 TTA CREW SUMMARY**

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)	
		ENGPRC	CHMOPR
DAY	A1	1	5
DAY	A2	1	5

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**TABLE 1.5-76
 SHIFT MAINTENANCE (MAINT) CREW SUMMARY**

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)				
		MNTMGR	ELECTN	INSMEC	MILWRT	PIPFTR
DAY	A1	1	3	3	3	3
NIGHT	A2	1	3	3	3	3

**TABLE 1.5-77
 CENTRALIZED MAINTENANCE SERVICES (CMS) CREW SUMMARY**

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)					
		CRPNTR	MCHNST	OILER	PAINTR	RIGGER	WELDER
DAY	A1	0.2	0.1	0.2	0.1	1.0	0.2

Similarly, the Silos 1 and 2 Operations Support Staff have been organized into work groups to ensure that the operations and maintenance work crews are adequately supported. Table 1.5-78 summarizes the Silos 1 and 2 Operations Support Staffing.

**TABLE 1.5-78
 -OPERATIONS SUPPORT STAFFING SUMMARY**

RESOURCE CODE	MANPOWER (FTEs)
OPRMGR	3
PJSMGR	1
MNTMGR	1
ENGPRG	2
DEPADM	2
CLERKS	1
RADENG	1.5
RADMGR	1.5
S&HTEC	1
MNTREP	2
PJSREP	1
WSTMGR	0.5

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Based upon this workforce staffing profile, a significant amount of OT and doubletime (DT) will be required to be worked by the O&M team. ~~Table 1.5-79~~ provides a summary of the planned OT for this project.

**TABLE 1.5-79
 SILOS 1 AND 2 PROJECT O&M OVERTIME SUMMARY**

SILOS 1 AND 2 O&M		OPERATIONAL MANHOURS		
RESOURCE CODE	FTEs	OT	DT	TOTAL
CHEMOPR	19	45,600	17,100	62,700
CLERKS	1	380	0	380
GRPNTR	0.2	200	0	200
DEPADM	1	380	0	380
ELECTN	6	7,100	0	6,900
ENGPRG	7	9,880	3,420	13,300
HEOOPR	2	6,080	2,280	8,360
INSMEG	6	7,100	0	6,900
MCHNST	0.1	100	0	100
MILWRT	6	7,100	0	6,900
MNTMGR	4	3,360	0	3,260
MNTREP	2	760	0	760
OILER	0.2	200	0	200
OPRMGR	8	12,920	4,560	17,480
PAINTR	0.1	100	0	100
PIPFTR	6	7,100	0	6,900
PJSREP	1	380	0	380
RADENG	1.5	570	0	570
RADTEC	11.5	18,810	6,840	25,650

SILOS LAND-2 O&M		OVERTIME MAN-HOURS		
RESOURCE CODE	FILES	OT	DT	TOTAL
RIGGER	4	1,000	0	1,000
S&HENG	2	6,080	2,280	8,360
S&HTEG	4	380	0	380
WELDER	0.2	200	0	200
TOTAL	93.7	142,240	38,760	181,000

The OT represented in Table 1.5-79 includes all OT and DT for Charge No. HS1AL. This includes all OT and DT that is worked during RGS operations (Section 1.5.10.2), SOT and ORR (Sections 1.5.9.4 and 1.5.9.5), and O&M (Section 1.5.10).

Other Direct Costs

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The resource planning for this charge number also includes the following other direct costs:

- Consumables;
- Chemicals (Cement, Phosphate, and Flyash);
- PPE (tyveks, respirators, etc.);
- Safety Equipment;
- General Supplies; and
- Laboratory Analyses.

The following Table 1.5-80 summarizes the basis for calculating the other direct costs incurred during the operations.

**TABLE 1.5-80
 SUMMARY OF OTHER DIRECT COSTS**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
CHEMICALS			
1	PHOSPHATE	Chemical stabilization additive — 1.5 wt%	\$586,500
		3,333,000 pounds (1,700 tons)	
		345 \$/ton bulk delivery	
2	CEMENT	Chemical stabilization additive — 34.3 wt%	\$2,300,000
		46,000,000 pounds (23,000 tons)	
		100 \$/tons bulk delivery	

**TABLE 1.5-80
 SUMMARY OF OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
3	FLYASH	Chemical stabilization additive — 14.7 wt%	\$315,000
		15,000,000 pounds (7,500 tons)	
		42 \$/ton bulk delivery	
4	FLOCCULANT	Alum, 100 lbs./day, 250 days @ \$1.00/lb bulk delivery	\$25,000
5	CAUSTIC	NaOH, 200/lbs/day, 250 days @ \$1.00/lb bulk delivery	\$50,000
5a	Absorbent	For mitigation of excess moisture in container— \$120/container (7,500 containers)	\$900,000
Sales Tax Chemicals (6%)			\$250,590
SUBTOTAL CHEMICALS			\$4,427,090
LABORATORY SERVICES			
6	LABORATORY SERVICES (SOLID NTS WAG)	3,000 batches sampled	\$150,000
		Collect 1 sample/batch	
		Production of 12 batches/day	
		Archive 3,000 split samples @ \$50/sample	
		Composite 250 (12 batch sample splits/day) for TCLP metals and radionuclides @ \$1,000/sample	
7	LABORATORY SERVICES (LIQUID AWWT ACCEPTANCE CRITERIA)	1 wastewater sample/week (of filtrate prior to discharge to AWWT)	\$90,000
		60 samples collected and analyzed	
		Analyte suite attached	
		\$1,500/sample assumed	
8	LABORATORY SERVICES (STACK FILTER PAPER)	1 air filter paper sample (biweekly)	\$45,000
		30 samples	
		Analyte suite attached	
		\$1,500/sample	

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**TABLE 1.5-80
 SUMMARY OF OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
9	LABORATORY SERVICES (SLURRY FEED TANK)	Slurry Feed Tank 3 samples/day, 365 days	\$120,000
		1,095 samples rounded to 1,200 samples, analyze for moisture content @ \$100/sample	
		1 sample/week, Inductively Coupled Plasma (ICP) Mass spectrometer analysis for lead (Pb)	\$52,000
		52 samples @ \$1,000/sample	
10	LABORATORY SERVICES (OSHA COMPLIANCE SAMPLES)	Breathing Zone, Area Monitors	\$56,000
		Filter Media Analysis for:	
		<ul style="list-style-type: none"> • 70 metals (\$100 ea) • 20 organics (\$100 ea) • 20 particulates (\$20 ea) • 20 silica (\$90 ea) 	
		5X to estimate sample handling costs	
11	MISCELLANEOUS (SOLID SECONDARY WASTE)	HEPA Filters	\$146,000
		PPE	
		1 TCLP Sample/day, 365 days	
		TCLP at \$400/sample	
11A	D&D (SILOS AND STRUCTURES)		

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**TABLE 1.5-80
 SUMMARY OF OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)	
PPE EQUIPMENT				
12	SARANEX	Saranex Units	\$618,675	
		Hood		
		Booty		
		Coverall		
		75 units/day		
		365 days		
		\$22.60/unit		
13	TYVEKS	Tyvek coverall units	\$109,500	
		Hood		
		Coverall		
		75 units/day		
		365 days		
		\$4/unit		
14	RUBBER BOOTIES	12 in., 20 mil latex	\$109,500	
		Model 10241, boot/shoecover		
		ARAMSCO, pg 16		
		75 units/day		
		365 days		
		\$4/unit		
15	BUBBLE SUITS	Bubblesuit with hood	\$21,400	
		Qty (200) units		
		\$42/suit, \$65/hood		
		\$107/unit		
16	TENNELEG	Smear Test Analyzer	\$45,000	
		Qty (1)		
17	PORTABLE AIR MOVEMENT HEPA UNITS WITH FILTERS	NFS RPS, Model PFB-800	\$22,000	
		2 units @ \$5,000 each		
		24 Replacement filters @ \$500 each		
18	WET VAC HEPA	Power Products	\$12,000	
		4 units required		
		\$3,000/unit		
		4 long hose connections		
		4 filters/weeks for 52 weeks		\$9,360
		208 filters @ \$45 each		

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**TABLE 1.5-80
 SUMMARY OF OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
19	POWERED AIR PURIFYING RESPIRATORS (PAPR) (WITH FILTERS)	3M PAPRs with belts	\$22,050
		30 units @ \$500/unit	
		30 battery packs @ \$175	\$65,700
		30 battery chargers @ \$60	
	10,950 HEPA filters (30/day, 365 days, \$6 each (Model P-100))		
20	APR (WITH FILTERS)	Full Face 3M APRs	\$8,400
		Qty (60) @ \$140/each	\$219,000
		Respirator Cartridges	
		2 Cartridges per set	
		1 set/person	
		30 person/day	
		365 days	
	\$20/set of cartridges		
21	PERMAGON	NFS RPS	\$20,000
		Stainless steel Enclosure Model CS103, (12' w x 16' l x 8' h)	\$9,500
		Installed costs \$20,000	
		NFS Portable HEPA Filtration Unit, SP-505, \$3,500	
		12 Replacement HEPA filters @ \$500 each	
22	WORKING LEVEL RADON MONITOR	Model WLX	\$17,000
		Qty (2)	
		\$8,500 each	
23	POCKET DOSIMETER	Aerotech Self-Reading Pocket Dosimeter	\$1,500
		Qty (24) @ \$50 each	
		Qty (2) charges @ \$150 each	
24	COOL VESTS	Oecconomics Phase Change Gold Pack Vest, Qty (50)	\$24,450
		\$350 each	
		Replacement Gelpacks @ \$139 each, Qty (50)	
25	FREEZER	Commercial Grade	\$1,500
		Holds 50 cold vests	

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TABLE 1.5-80
SUMMARY OF OTHER DIRECT COSTS (CONT'D)

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
26	FLOOR SCRUBBER	Industrial grade	\$1,500
		Scrub Pads	
27	GLOVE BAGS	Qty (200)	\$2,240
		ARAMSCO, Item 56011, 66" x 84"	
		\$160/roll, 15 bags/roll	
28	LEAD BLANKETS	Qty (40)	\$4,000
		Lead wool blankets (12" x 48")	
		\$100 each	
29	BREATHING ZONE AIR SAMPLES	30 new samplers	\$18,000
		\$600 each	
30	ALPHA FRISKERS	Model ASP-23 with alpha probe	\$3,000
		Qty (2)	
		\$1,500 each	
31	OSHA COMPLIANCE EQUIPMENT	Provide equipment, repair, calibration for: <ul style="list-style-type: none"> • (10) SKC Air Samplers & (2) chargers • (2) MIE Aerosol Monitors • (2) Industrial Scientific Multi-gas Monitor • (4) Metrosonics Noise Monitors • (2) Sound Level Meters (Quest) • (2) Quest Temp 30 • (2) Drager CMS Analyzers • (2) Industrial Scientific T-82 Single Gas Monitor 	\$54,000
32	SCAFFOLDING	Tube Lock Scaffolding	\$50,000

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**TABLE 1.5-80
 SUMMARY OF OTHER DIRECT COSTS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
33	MISCELLANEOUS	<ul style="list-style-type: none"> •—Leather Palm gloves •—Duct Tape •—B-Z Filters •—Camlox •—Hoses •—Buckets •—Carharts •—Rubber gloves •—Latex gloves •—Sorbents •—Hard hats •—Heaving protection •—Glasses •—Reinforced disposable ductwork •—Etc., etc., etc. 	\$200,000
MISCELLANEOUS			
34	RUMPKE DUMPSTER	40 yd ³ rolloff with liner \$150/load delivery \$230 (\$23/ton disposal fee) \$30 (3/ton handling fee) \$40 (liner) Assumes 10 tons/load Assumes 1 dumpster/month for 12 months	\$5,400
35	RUMPKE PORT-A-LETS	Assume 6 units \$5/month rental/unit \$100 service/month/unit 12 months duration	\$7,560
36	BOTTLED WATER	\$3.50/bottle (stores item) Consumption rate—40 bottles/month for 12 months Cost = (3.50 x 40 x 12) = \$1,680	\$1,680

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~~2) Task #2 - RCS Operations and TTA Maintenance~~

~~2.1) Plan/Scope - RCS Operations and TTA Maintenance~~

~~Upon completion of the AWR Project, ownership and responsibility for the operation and maintenance of the RCS and TTA will be transferred to the Silos 1 and 2 Project. The Silos 1 and 2 Project will have to continuously operate and maintain the RCS and TTA equipment in order to control the release of radon from the TTA tanks, and ensure the waste transfer equipment remains operable for future use. The scope of this effort will be managed and reported under the Activity No. 104810, entitled, "RCS Operations." The manpower planning for this activity is based upon a "skeleton crew" to continuously monitor and maintain the RCS operations in a safe manner. The manpower requirements are consistent throughout the duration of this activity. The resources will be managed and reported under charge number HS1AL.~~

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~~Upon receiving authorization to operate the Silos 1 and 2 remediation facility from DOE, the manpower planning for the RCS Operations will be included in the O&M manpower plan under Activity No. 101000, entitled, "Operations."~~

~~The duration of the RCS Operations activity is approximately thirty five (35) weeks. It begins with the current forecasted start of demobilization of the AWR Project Contractor and ends with the beginning of the Silos 1 and 2 Project treatment operations.~~

~~2.2) Quantification - RCS Operations and TTA Maintenance~~

~~The operation of the RCS is 24 hours/day for thirty five (35) weeks. Table 1.5-81 summarizes the shift coverage for the RCS O&M crews. Continuous operation only requires working one (1) dayshift crew, 10 hours per day 4 days per week. Off shift coverage will be provided by the AWWT control room. Similarly, maintenance of the TTA will be conducted by one (1) dayshift crew on a 10 hours per day 4 days per week basis.~~

**TABLE 1.5-81
 SHIFT COVERAGE SUMMARY**

SHIFT	SHIFT COVERAGE (NO. CREWS)		
	CR	CMS	MAINT.
DAY	1	1	1

Based upon the Silos 1 and 2 work crew designations and the operations work schedule; a manpower staffing plan has been developed to ensure that all RCS operations are adequately staffed. The following Tables 1.5-82 through 1.5-84 summarize the Silos 1 and 2 operations and maintenance staffing plan by work crew.

**TABLE 1.5-82
 CR CREW SUMMARY**

SHIFT	CREW ID NO.	MANPOWER RESOURCE CODE (FTE)			
		OPSMGR	ENGPRG	CHMOPR	RADTEC
DAY	A1 CR	1	1	2	3
TOTAL RESOURCES		1	1	2	3

**TABLE 1.5-83
 CMS CREW SUMMARY**

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)					
		CRPNTR	MCHNST	OILER	PAINTR	RIGGER	WELDER
DAY	A1	0.2	0.1	0.2	0.1	1.0	0.2

**TABLE 1.5-84
 SHIFT MAINTENANCE CREW SUMMARY**

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)				
		MNTMGR	ELECTN	INSMEC	MILWRT	PIPFTR
DAY	A1	1	3	3	3	3

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The OT labor for the RCS crew is included in the Silos 1 and 2 Project Summary in Table 1.5-79.

Other Direct Costs

The resources planning for the RCS Operations also includes the need for the following consumable items and services which are considered "other direct costs." Table 1.5-85 summarizes these items and their costs.

**TABLE 1.5-85
 OTHER DIRECT COSTS — RCS OPERATIONS**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
1	LABORATORY SERVICES (LIQUID AWWT ACCEPTANCE CRITERIA)	1 wastewater sample/month (of filtrate prior to discharge to AWWT)	\$36,000
		24 samples collected and analyzed	
		Analyte suite attached	
		\$1,500/sample assumed	
2	LABORATORY SERVICES (STACK FILTER PAPER)	1 air filter paper sample (biweekly)	\$78,000
		52 samples	
		Analyte suite attached	
		\$1,500/sample	
3	LABORATORY SERVICES (OSHA COMPLIANCE SAMPLES)	Breathing Zone, Area Monitors	\$45,400
		Filter Media Analysis for:	
		• 70 samples metals (\$100 ea)	
		• 104 samples particulates (\$20 ea)	
	5X to estimate sample handling costs		
PPE EQUIPMENT			
4	TYVEKS	Tyvek coverall units Hood Coverall	\$2,400
		25 units/month	
		24 months	
		\$4/unit	
5	RUBBER BOOTIES	12 in., 20 mil latex Model 10241, boot/shoecover ARAMSCO, pg 16	\$2,400
		25 units/month for 24 months	
		\$4/unit	

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**TABLE 1.5-85
 OTHER DIRECT COSTS — RCS OPERATIONS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
6	BUBBLE SUITS	Bubblesuit with hood	\$10,700
		Qty (100)	
		\$42/suit, \$65/hood	
		\$107/unit	
7	PAPR (WITH FILTERS)	PAPRs with belts	\$14,700
		ARAMSCO, ISI Typhoon, pg 35	
		20 units @ \$500/unit	
		20 battery packs @ \$175/pk	
		20 battery chargers @ \$60/unit	\$5,760
		960 HEPA filters (20/day x 2 days x 24 months) \$6 each (Model P-100)	
8	APR (WITH FILTERS)	APRs	\$2,800
		Qty (20) @ \$140/each	
		Respirator Cartridges	\$292,000
		2 Cartridges per set	
		1 set/person	
		20 person/day	
		24 months	
\$20/set of cartridges			
9	POCKET DOSIMETER	Qty (24) @ \$50 each	\$1,200
10	LEAD BLANKETS	Qty (6)	\$600
		Lead wool blankets (12" x 48")	
		\$100 each	
MISCELLANEOUS			
11	MISCELLANEOUS	Operation & maintenance of RCS for 2 years Leather palm gloves, tape, bags, B-Z filters, Camlox, hoses, buckets, Carharts, sorbents, glasses, etc.	\$50,000
12	BOTTLED WATER	\$3.50/bottle (stores item)	\$1,680
		Consumption rate — 20 bottles/month for 24 months	
		Cost = (3.50 x 20 x 24) = \$1,680	

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1.5.10HS1AL - Operations and Maintenance

Scope

As part of the Silos 1 and 2 remedial actions, the following O&M activities will be performed:

- O&M Design Support;
- O&M IFB Support;
- O&M Training;
- O&M SOT;
- O&M Support ORR;
- Waste Transfer (from the TTA Tanks) and Treatment; and
- RCS and TTA Operations.

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The scope, schedule, and resources for these actions will be managed and reported under Charge No. HS1AL. The following sections describe the scope of the O&M activities.

1) Task #1- O&M Design Support

1.1) Plan/Scope - O&M Design Support

The Silos 1 and 2 O&M team members will provide support to the preparation of the Silos 1 and 2 engineering, safety basis, and design documentation. The O&M team members will perform operability and maintainability reviews of the Silos 1 and 2 design. The operability and maintainability reviews will involve evaluating and integrating practical O&M practices and requirements into the design configuration by ensuring safety, efficiency, productivity in O&M, minimizing unit operations, simplifying equipment and controls, minimizing worker exposure, etc.

Activity Hammock No. 100040 entitled, "O&M Design Support" begins with the constructability reviews during the Preliminary Design Package, Activity No. 101670, and lasts through the completion of the Final Design Package, Activity No. 101732. Earned value on this activity will be apportioned from the progress on design activities supported by this activity.

1.2) Quantification - O&M Design Support

The O&M staff supporting the Silos 1 and 2 design development is summarized in Table 1.5-71A. No overtime for O&M labor is planned during this activity.

TABLE 1-5-71A
RESOURCE SUMMARY FOR O&M DESIGN SUPPORT

RESOURCE CODE	ACTIVITY NO. 100040 TOTAL RESOURCES (FTEs)
CHEMOPR	0.1
PJSREP	0.3

2) Task #2 - O&M IFB Support

2.1) Plan/Scope - O&M IFB Support

The Silos 1 and 2 O&M team will provide support to the preparation of the Silos 1 and 2 bid package, completion of the government estimate, and bid/proposal evaluations.

The resources for the O&M team support for the IFB Preparation and the Bid and Award Process are loaded in Activity Hammock No. 100045 entitled, "O&M IFB Support." Earned value on this activity will be apportioned from the progress on the procurement activities supported by this activity.

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2.2) Quantification - O&M IFB Support

The O&M staff supporting the Silos 1 and 2 IFB Process is summarized in Table 1-5-71B. No overtime for O&M Labor is planned during this activity.

TABLE 1-5-71B
RESOURCE SUMMARY FOR O&M IFB SUPPORT

RESOURCE CODE	ACTIVITY NO. 100045 TOTAL RESOURCES (FTEs)
CHEMOPR	0.1
MNTREP	0.5
OPRMGR	1.0
PJSREP	0.3

3) Task #3 - O&M Training

3.1) Plan/Scope - O&M Training

The Silos 1 and 2 O&M team members will undergo classroom training and OJT. Training will be performance-based, focused on training personnel to perform tasks identified in Section 1.5.9, Task 3.

The labor resources for the O&M training are planned under Activity Hammock No. 100050 entitled, "O&M Training." Earned value on this activity will be measured based upon performance taken under the parallel Activity No. 113001 entitled, "Perform Training." The duration of the classroom training is planned at 14 weeks.

3.2) Quantification - O&M Training

The labor resources for O&M Training will be monitored and reported under Charge No. HS1AL. No overtime for O&M labor is planned during this timeframe.

4) Task #4 - O&M SOT Support

4.1) Plan/Scope - O&M SOT Support

The Silos 1 and 2 O&M team members will be responsible for performing all the SOTs of the Silos 1 and 2 remediation facility consistent with Section 1.5.9, Task 4. The SOTs are a major component of OJT for the Silos 1 and 2 workforce. The SOT experience will build upon the workers' classroom training and witnessing of the CAT. During this time, the Project Readiness Team will be assessing the preparedness of Silos 1 and 2 team members consistent with Section 1.5.9, Task 5.

The labor resources for O&M SOT support are planned under Activity Hammock No. 100055 entitled, "O&M SOT Support." Earned value will be credited based upon progress reported under the parallel Activity No. 100900 entitled, "SOT."

4.2) Quantification - O&M SOT Support

The labor resources for O&M SOT Support are planned under Charge No. HS1AL. During the performance of the Silos 1 and 2 SOTs, the O&M team members will be performing work on their respective crews and work shift assignments. Tables 1.5-73 through 1.5-79 summarize the workforce crews and their shift assignments.

5) Task #5 - O&M ORR Support

5.1) Plan/Scope - O&M ORR Support

The Silos 1 and 2 O&M team members will participate in the ORR consistent with Section 1.5.9, Task 5. The training, qualifications, and experience of the Silos 1 and 2 team members will be evaluated to ensure that each activity will be operated safely within its approved safety envelope as defined by the Silos 1 and 2 safety basis.

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The labor resources for Silos 1 and 2 O&M ORR Support are planned under Activity Hammock No. 100060 entitled, "O&M - ORR Support." Earned value will be apportioned based upon progress reported under parallel Activity No. 104890 entitled, "ORR."

5.2) Quantification - O&M ORR Support

The Silos 1 and 2 O&M team labor resources are planned under Charge No. HS1AL. During the performance of the Silos 1 and 2 ORR, the O&M team members will be performing work on their respective crews and work shift assignments. Tables 1.5-73 through 1.5-79 summarize the workforce crews and their shift assignments.

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6) Task #6 - Waste Transfer and Treatment Process

6.1) Plan/Scope - Waste Transfer and Treatment Process

Waste Transfer

Upon completion of the AWR Project, responsibility for the maintenance of the TTA facility will be transferred to the Silos 1 and 2 Project. The Silos 1 and 2 Project will have to maintain the TTA facilities in a standby mode, until it is placed into operations as part of the Silos 1 and 2 Project.

The Silos 1 and 2 material will have been staged in the TTA for a while before retrieval operations by the TTA Waste Retrieval System (TWRS). The TWRS is an existing facility that will allow for access, mobilization, and removal of the material from the interior of the TTA tanks. The Silos 1 and 2 Project will tie in at flanged connections and provide all piping and equipment that is required to interface with the TWRS. The TWRS retrieval equipment will have the capacity of transferring approximately 5,900 lb/hr of solids to the Silos 1 and 2 Remediation Facility.

In addition to the existing equipment, the TWRS will include the facilities and equipment to recycle, to the extent practical, any water removed from the transferred slurry. The existing TTA facility will include the Ultra Filtration System as well as the associated filtrate storage tank and filter process tank, each having a storage capacity of 7,500 gallons.

Once the Silos 1 and 2 material is mobilized in the TTA tanks, it will be transferred to one of several slurry receipt tanks - the entry point of the treatment process. All material must be removed from the TTA tanks, leaving the interior surface of the tanks "visibly free" of material.

The Silos 1 and 2 treatment process will chemically stabilize the untreated Silos 1 and 2 material to produce a final waste form that meets the TCLP test for metals and meets the NTS WAC. The treatment process begins with the transfer of the Silos 1 and 2 material from the TTA tanks to the slurry receipt tanks. The slurry is then pumped to a mixing tank where a flocculating agent is added and any pH adjustments can be made. The slurry waste overflows to a clarifier where the waste is settled up to 30 wt% solids. At the clarifier, the supernatant is recycled back to the TTA while the 30 wt% solids underflow is pumped to one of the three slurry feed tanks.

The waste in the slurry feed tanks is then pumped to the high-shear mixers. The mixers are located upon a loadcell weighing system, which ensures the proper amount of Silos 1 and 2 material is metered into each mixer. The chemical stabilization treatment formulation requires that proper portions of stabilizing additives (i.e., triple-super phosphate, cement, and flyash) are added to the mixers. After the Silos 1 and 2 material and the chemical additives are thoroughly mixed, the "batch" of treated material is discharged directly into the disposal containers. The volume of each batch is capable of filling one (1) disposal container. During each 24-hour operational period, an average of 30 batches can be processed. A total of 7,500 batches will be required to process all of the Silos 1 and 2 material.

While each batch is being discharged to the containers, a sample from every other batch will be collected. After each batch of waste has been discharged to the containers, a lid will be placed and secured on the containers. The sealed waste containers will be conveyed to an area where their exterior surfaces are surveyed and decontaminated as necessary. The containers are then released for shipment and transferred to the Silos 1 and 2 shipping area, to be staged for transport to the NTS. The loading and transportation of the packaged waste to the NTS is discussed in Section 1.5.11 of this closure plan.

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Samples

A sample from every other batch will be collected in reusable trays having 9mm pellet molds. At the end of the day, a sample split from each batch will be archived and the other half will be composited with sample splits from each of the other batches. Each composited sample will represent the population of treated waste containers from that day's production. A portion of the composited sample will be submitted to the laboratory for NTS WAC compliance analysis. An estimated 3,000 samples will be collected, and an estimated 250 composited samples will be tested for compliance with the NTS WAC (Table 1.5-30, Item 6).

In addition, all wastewater will be collected in a holding tank and sampled for compliance with the FEMP AWWT acceptance criteria prior to transfer. The wastewater samples will be analyzed for Total Dissolved Solids, Total Suspended Solids, pH, radiological and TCLP metals. It is estimated that up to 1,000 gallons of wastewater could be generated on a weekly basis from the treatment process, from routine equipment flushing and washdown activities. Samples will be collected weekly prior to transfer to the AWWT. An estimated 60 samples will be collected throughout the operations period (Table 1.5-80, Item 7).

In order to demonstrate compliance with regulatory air emission requirements, the Silos 1 and 2 stack emissions will be monitored. Routine samples will be collected on a bi-weekly basis and submitted to an off-site third-party laboratory for analysis (Table 1.5-80, Item 8).

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Throughout the duration of the O&M activities, routine process sampling of the three (3) slurry feed tank contents will be performed on a daily basis. Samples will be analyzed for moisture content, so that any required treatment formulation adjustments can be made prior to processing each tank. The required turnaround time for this analytical procedure is 2 to 4 hours. It is estimated that 1,200 samples will be collected. In addition, a weekly sample will be processed for lead, using inductively coupled plasma - mass spectrometer (ICP-MS) analysis (Table 1.5-80, Item 9).

Through the duration of the O&M activities, routine sampling will also be performed by FEMP's Health and Safety Department to verify that the workers' environment is in compliance with Occupational Safety and Health Administration (OSHA) standards. These samples will be collected periodically and sent to an off-site third-party laboratory for analysis (Table 1.5-80, Item 10).

Off-Specification Waste

For establishing the technical baseline, it is assumed that 1% of all the Silos 1 and 2 treated material (75 containers) will fail the NTS WAC. The Silos 1 and 2 treatment process will be designed without the capability of reworking any treated Silos 1 and 2 material that fails to meet the NTS WAC. The project has assumed that it will identify an alternative disposal method (i.e., macroencapsulation) and/or location to address this situation. If the project team does not identify an alternative disposal solution to reworking the off-specification treated waste, then the project will design and construct a rework process. This issue has been identified in the Silos 1 and 2 Project Risk Management Plan in Section 5 of this Closure Plan.

O&M Schedule

The Silos 1 and 2 Project cannot begin operations until Fluor Fernald receives authority from DOE to operate following completion of the ORR process. The total duration of the Silos 1 and 2 O&M activities is one (1) year or 365 calendar days.

Earned value will be determined based on the quantity of Silos 1 and 2 material removed from the TTA tanks. Each of the four (4) TTA tanks will represent 25% of the volume of Silos 1 and 2 material to be treated. A monthly determination of the volume of waste treated from an individual tank will be calculated using the combination of the tanks' level indicator readings and remote visual inspections.

6.2) Quantification - Waste Transfer and Treatment Process

For resource planning, the assumed availability (uptime) of the plant is 70%; however, it will be designed and constructed for 100% availability. Therefore, only 250 days of uptime would be required to treat all of the Silos 1 and 2 material within a one (1) year production schedule. However, the manpower planning for the O&M activities is based upon a continuous operations schedule of two (2) 12-hour shifts/day, 24 hours/day, 7 days/week, 52 weeks/year for one (1) year.

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The responsibilities of the Silos 1 and 2 O&M Support is summarized in Table 1.5-72 into the following functional areas:

**TABLE 1.5-72
 O&M SUPPORT**

FACILITY OPERATIONS	OPERATIONS PLANNING
Maintain Collective Status of Operations	Operations T&OP
Plant operation, control of equipment and equipment status	T&OP Coordination and Administration
Support Performance of SOTs	Procedure and Document Preparation
Validate Standard Operating Procedures (SOPs)	Readiness Documentation Preparation
Plant operation during startup	Performance Measures
	Operations Schedules
FACILITY OWNER	FIELD ENGINEERING
Lock & Tag Program Technical Rep.	Technical support to Project Operations during startup and waste operations
Construction interface	Technical support to Maintenance Staff
AWWT/UE interface	Field alteration USOD Screening
Site support Coordination	Operational Contingency Planning
Analytical Lab Coordination	Configuration Management
Overtime lists	
Labor issues	MAINTENANCE
Routine groundskeeping activities	Corrective Maintenance and Preventative Maintenance
Perform daily walkthroughs and inspections	Overtime tracking
Provide materials and perform maintenance	Resource Management
Provide for rental equipment and contracted services	Stores/Spare Parts/Tools, etc.
Perform waste/storage/handling/transfer activities as necessary	Programmatic Maintenance Support
Implement and update the K65 Emergency Dome Failure Recovery Plan	
Provide Silos Project integration effort with site in regard to utilization	
Water transfer activities from Pilot Plant, K65 trench, Decant Sump Tank	
Maintain the Decant Sump and pump (as needed)	

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Maintain existing fencing and radiological postings/signs/ropes	
Area access control	
Preventative maintenance as required	
Honeywell support	
Miscellaneous PPE	
Bottled water	
General Housekeeping	
Silt fencing installation and maintenance	
Equipment calibration	
Dumpsters and miscellaneous containers (55 gallon drums)	
Personnel moves and relocations	

To facilitate manpower planning, the O&M personnel have been organized into the following work crews based on major functional areas:

Crew Area (ID)	Responsibilities
Control Room (CR)	CR Operations/Plant Coordination
Process Plant Area (PPA)	PPA and Equipment
Transfer Tank Area (TTA)	TTA Area and Equipment Operation
Shift Maintenance (MAINT)	Silos 1 and 2 Remediation Facilities
Centralized Maintenance Services (CMS)	As Needed Maintenance Support
Support Staff	O&M/Waste Operations Support

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The following Table 1.5-73 summarizes the shift coverage for the Silos 1 and 2 O&M crews. By working two (2) 12-hour shifts/day, 4-day rotations, there is a need to have two (2) day shifts and two (2) complimentary night shifts for the CR and PPA crews. The transfer of Silos 1 and 2 material from the TTA will be conducted on a single 12-hour shift/day, 4-day rotation, therefore, two (2) day shift TTA crews are required.

The maintenance activities will be performed on a single day shift and night shift basis. Maintenance crews will work a standard 10-hour shift/day, 4-days/week.

**TABLE 1.5-73
SHIFT COVERAGE SUMMARY**

SHIFT	SHIFT COVERAGE (NO. CREWS)				
	CR/PPA	TTA	MAINT	SS	CMS
DAY	2	2	1	1	1
NIGHT	2	1	1	1	1

Based upon the work crew designations and the operations work schedule, a manpower staffing plan has been developed to ensure that all plant operations are adequately staffed. The following Tables 1.5-74 through 1.5-77 summarize the Silos 1 and 2 O&M staffing plan by work crew.

TABLE 1.5-74
CR/PPA CREW SUMMARY

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)						
		OPRMGR	ENGPRC	CHMOPR	HEOOPR	RADTEC	S&HENG	INHTEC
DAY	A1	2	1	5	1	3	1	1
DAY	A2	2	1	5	1	3	1	1
NIGHT	B1	2	1	5	1	3	1	1
NIGHT	B2	2	1	5	1	3	1	1

TABLE 1.5-75
TTA CREW SUMMARY

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)	
		ENGPRC	CHMOPR
DAY	A1	1	5
DAY	A2	1	5

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TABLE 1.5-76
SHIFT MAINTENANCE (MAINT) CREW SUMMARY

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)				
		MNTMGR	ELECTN	INSMEC	MILWRT	PIPFTR
DAY	A1	1	3	3	3	3
NIGHT	A2	1	3	3	3	3

TABLE 1.5-77
CENTRALIZED MAINTENANCE SERVICES (CMS) CREW SUMMARY

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)					
		CRPNTR	MCHNST	OILER	PAINTR	RIGGER	WELDER
DAY	A1	0.2	0.1	0.2	0.1	1.0	0.2

Similarly, the Silos 1 and 2 Operations Support Staff have been organized into work groups to ensure that the O&M work crews are adequately supported. Table 1.5-78 summarizes the Silos 1 and 2 Operations Support Staffing.

TABLE 1.5-78
OPERATIONS SUPPORT STAFFING SUMMARY

RESOURCE CODE	MANPOWER (FTEs)
OPRMGR	3
PJSMGR	1
MNTMGR	1
ENGRRC	2
DEPADM	2
CLERKS	1
RADENG	1.5
RADMGR	1.5
S&HTEC	1
MNTREP	2
PJSREP	1
WSTMGR	0.5

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Based upon this workforce staffing profile, a significant amount of OT and doubletime (DT) will be required to be worked by the O&M team. Table 1.5-79 provides a summary of the planned OT and DT for this project. This includes all OT and DT that is worked during RCS operations (Section 1.5.10, Task 7), SOT and ORR (Sections 1.5.9, Tasks 4 and 5), and O&M (Section 1.5.10).

TABLE 1.5-79
SILOS 1 AND 2 PROJECT O&M OVERTIME SUMMARY

SILOS 1 AND 2 O&M		OVERTIME MANHOURS		
RESOURCE CODE	FTEs	OT	DT	TOTAL
CHEMOPR	17	28,500	17,100	45,600
CLERKS	1	380	0	380
CRPNTR	0.2	208	0	208
DEPADM	1	380	0	380
ELECTN	6	7,100	0	7,100
ENGPRC	6	6,460	3,420	9,880
HEOOPR	2	3,800	2,280	6,080
INDHYG	1	380	0	380
INSMEC	6	7,100	0	7,100
MCHNST	0.1	104	0	104
MILWRT	6	7,100	0	7,100
MNTMGR	4	3,360	0	3,360
MNTREP	2	760	0	760
OILER	0.2	208	0	208
OPRMGR	7	8,360	4,560	12,920
PAINTR	0.1	104	0	104
PIPETR	6	7,100	0	7,100
PJSREP	1	380	0	380
RADENG	1.5	570	0	570
RADTEC	9.5	11,970	6,840	18,810
RIGGER	1	1,040	0	1,040
S&HENG	4	7,600	4,560	12,160
S&HTEC	1	380	0	380
WELDER	0.2	208	0	208
TOTAL	83.8	103,552	38,760	142,312

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Other Direct Costs

The resource planning for Charge No. HS1AL also includes the following other direct costs:

- Consumables;
- Chemicals (Cement, Phosphate, and Flyash);
- PPE (tyveks, respirators, etc.);
- Safety Equipment;
- General Supplies; and
- Laboratory Analyses.

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The following Table 1.5-80 summarizes the basis for calculating the other direct costs incurred during the operations and maintenance activities.

**TABLE 1.5-80
 SUMMARY OF OTHER DIRECT COSTS**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
CHEMICALS			
1	PHOSPHATE	Chemical stabilization additive - 1.5 wt% 3,333,000 pounds (1,700 tons) \$345/ton bulk delivery	\$586,500
2	CEMENT	Chemical stabilization additive - 34.3 wt% 46,000,000 pounds (23,000 tons) \$100/tons bulk delivery	\$2,300,000
3	FLYASH	Chemical stabilization additive - 14.7 wt% 15,000,000 pounds (7,500 tons) \$42/ton bulk delivery	\$315,000
4	FLOCCULANT	Alum, 100 lbs/day, 250 days @ \$1.00/lb bulk delivery	\$25,000
5	CAUSTIC	NaOH, 200 lbs/day, 250 days @ \$1.00/lb bulk delivery	\$50,000
5a	ABSORBENT	For mitigation of excess moisture in container - \$120/container (7500 containers)	\$900,000
		Sales Tax Chemicals (6%)	\$250,590
		SUBTOTAL CHEMICALS	\$4,427,090

TABLE 1-5-80
SUMMARY OF OTHER DIRECT COSTS (CONT'D)

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
LABORATORY SERVICES			
6	LABORATORY SERVICES (SOLID SAMPLES NTS WAC)	3,000 batches sampled	\$150,000
		Collect 1 sample/batch	
		Production of 12 batches/day	\$250,000
		Archive 3,000 split samples @ \$50/sample	
		Composite 250 (12 batch sample splits/day) for TCLP metals and radionuclides @ \$1,000/sample	
7	LABORATORY SERVICES (LIQUID AWWT ACCEPTANCE CRITERIA)	1 wastewater sample/week (of filtrate prior to discharge to AWWT)	\$90,000
		60 samples collected and analyzed	
		Analyte suite attached	
		\$1,500/sample assumed	
8	LABORATORY SERVICES (STACK FILTER PAPER)	1 air filter paper sample (biweekly)	\$45,000
		30 samples	
		Analyte suite attached	
		\$1,500/sample	
9	LABORATORY SERVICES (SLURRY FEED TANK)	Slurry Feed Tank 3 samples/day, 365 days	\$120,000
		1,095 samples rounded to 1,200 samples, analyze for moisture content @ \$100/sample	
		1 sample/week, Inductively Coupled Plasma (ICP) Mass spectrometer analysis for lead (Pb)	\$52,000
		52 samples @ \$1,000/sample	

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TABLE 1.5-80
SUMMARY OF OTHER DIRECT COSTS (CONT'D)

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
10	LABORATORY SERVICES (OSHA COMPLIANCE SAMPLES)	Breathing Zone, Area Monitors	\$66,500
		Filter Media Analysis for:	
		• 70-metals (\$100/ea)	
		• 30-organics (\$100/ea)	
		• 30-particulates (\$20/ea)	
		• 30-silica (\$90/ea)	
		5X to estimate sample handling costs	
11	MISCELLANEOUS (SOLID SECONDARY WASTE)	HEPA Filters	\$146,000
		PPE	
		1 TCLP Sample/day, 365 days	
		TCLP at \$400/sample	
SUBTOTAL LABORATORY SERVICES			\$919,500
PPE EQUIPMENT			
12	SARANEX	Saranex Units	\$618,675
		Hood	
		Boots	
		Coverall	
		75 units/day	
		365 days	
		\$22.60/unit	
13	TYVEKS	Tyvek coverall units	\$109,500
		Hood	
		Coverall	
		75 units/day	
		365 days	
		\$4/unit	
14	RUBBER BOOTIES	12 in., 20 mil latex	\$109,500
		Model 10241 boot/shoecover	
		ARAMSCO, pg 16	
		75 units/day	
		365 days	
		\$4/unit	

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TABLE 1-5-80
SUMMARY OF OTHER DIRECT COSTS (CONT'D)

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)	
15	BUBBLE SUITS	Bubblesuit with hood	\$21,400	
		Qty (200) units		
		\$42/suit, \$65/hood		
		\$107/unit		
16	TENNELEC	Smear Test Analyzer	\$45,000	
		Qty (1)		
17	PORTABLE AIR MOVEMENT HEPA UNITS WITH FILTERS	NFS RPS, Model PFB-800	\$22,000	
		2 units @ \$5,000 each		
		24 Replacement filters @ \$500 each		
18	WET VAC HEPA	Power Products	\$12,000	
		4 units required		
		\$3,000/unit		
		4 long hose connections		
		4 filters/weeks for 52 weeks		\$9,360
		208 filters @ \$45 each		
19	POWERED AIR PURIFYING RESPIRATORS (PAPR) (WITH FILTERS)	3M PAPRs with belts	\$22,050	
		30 units @ \$500/unit		
		30 battery packs @ \$175		
		30 battery chargers @ \$60		
		10 950 HEPA filters (30/day, 365 days, \$6 each) Model P-100		\$65,700
20	APR (WITH FILTERS)	Full Face 3M APRs	\$8,400	
		Qty (60) @ \$140/each		
		Respirator Cartridges	\$219,000	
		2 Cartridges per set		
		1 set/person		
		30 person/day		
		365 days		
		\$20/set of cartridges		

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TABLE 1.5-80
SUMMARY OF OTHER DIRECT COSTS (CONT'D)

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
21	PERMACON	NFS RPS	\$20,000
		Stainless steel Enclosure Model CS103, (12' w x 16' l x 8' h)	
		Installed costs \$20,000	
		NFS Portable HEPA Filtration Unit, SP-505, \$3,500	
22	WORKING LEVEL RADON MONITOR	Model WLX	\$17,000
		Qty (2)	
		\$8,500 each	
23	POCKET DOSIMETER	Aerotech Self Reading Pocket Dosimeter	\$1,500
		Qty (24) @ \$50 each	
		Qty (2) charges @ \$150 each	
24	COOL VESTS	Occunomics Phase Change Cold Pack Vest, Qty (50)	\$24,450
		\$350 each	
		Replacement Gelpacks @ \$139 each, Qty (50)	
25	FREEZER	Commercial Grade	\$1,500
		Holds 50 cold vests	
26	FLOOR SCRUBBER	Industrial grade	\$1,500
		Scrub Pads	
27	GLOVE BAGS	Qty (200)	\$2,240
		ARAMSCO, Item 56011, 66" x 84"	
		\$160/roll, 15 bags/roll	
28	LEAD BLANKETS	Qty (40)	\$4,000
		Lead wool blankets (12" x 48")	
		\$100 each	
29	BREATHING ZONE AIR SAMPLERS	30 new samplers	\$18,000
		\$600 each	

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TABLE 1.5-80
SUMMARY OF OTHER DIRECT COSTS (CONT'D)

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
30	ALPHA FRISKERS	Model ASP-23 with alpha probe Qty (2) \$1,500 each	\$3,000
31	OSHA COMPLIANCE EQUIPMENT	Provide equipment, repair, calibration for: <ul style="list-style-type: none"> • (10) SKC Air Samplers & (2) chargers • (2) MIE Aerosol Monitors • (2) Industrial Scientific Multi-gas Monitor • (4) Merrosomics Noise Monitors • (2) Sound Level Meters (Quest) • (2) Quest Temp 30 • (2) Drager CMS Analyzers • (2) Industrial Scientific T-82 Single Gas Monitor 	\$54,000
32	SCAFFOLDING	Tube Lock Scaffolding	\$50,000
33	MISCELLANEOUS	<ul style="list-style-type: none"> • Leather Palm gloves • Duct Tape • E-Z Filters • Camlox • Hoses • Buckets • Carhats • Rubber gloves • Latex gloves • Sorbents • Hardhats • Hearing protection • Glasses • Reinforced disposable ductwork • Etc., etc., etc. 	\$200,000
Sales Tax PPE Equipment (6%)			\$100,157
SUBTOTAL PPE EQUIPMENT			\$1,769,432

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TABLE 1 5-80
SUMMARY OF OTHER DIRECT COSTS (CONT'D)

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
MISCELLANEOUS			
34	RUMPKE DUMPSTER	40 yd ³ rolloff with liner \$150/load delivery \$230 (1\$23/ton disposal fee) \$30 (3/ton handling fee) \$40 (liner) Assumes 10 tons/load Assumes 1 dumpster/month for 12 months	\$5,400
35	RUMPKE PORT-A-LETS	Assume 6 units \$5/month rental/unit \$100 service/month/unit 12 months duration	\$7,560
36	BOTTLED WATER	\$3.50/bottle (stores item) Consumption rate = 40 bottles/month for 12 months Cost = (3.50 x 40 x 12) = \$1,680	\$1,680
Sales Tax Miscellaneous Equipment (6%)			\$878
SUBTOTAL MISCELLANEOUS EQUIPMENT			\$15,518
TRAILER LEASES			
37	MONTHLY LEASE OF TRAILER NOS. 414 AND 415	Lessor: William Scottsman, Inc Trailer 414: Lease \$290/month for 12 months Trailer 415: Lease \$750/month for 12 months Demobilization = \$627 (both)	\$13,107
SUBTOTAL TRAILER LEASES			\$13,107

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7) Task #7 - RCS Operations and TTA Maintenance

7.1) Plan/Scope - RCS Operations and TTA Maintenance

Upon completion of the AWR Project, ownership and responsibility for the operation and maintenance of the RCS and TTA will be transferred to the Silos 1 and 2 Project. The Silos 1 and 2 Project will have to continuously operate and maintain the RCS and TTA equipment in order to control the release of radon from the TTA tanks, and ensure the waste transfer equipment remains operable for future use. The scope of this effort will be managed and reported under the Activity No. 104810, entitled, "RCS Operations." The manpower planning for this activity is based upon a "skeleton crew" to continuously monitor and maintain the RCS operations in a safe manner. The manpower requirements are consistent throughout the duration of this activity. The resources will be managed and reported under charge number HS1AL.

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Upon receiving authorization to operate the Silos 1 and 2 remediation facility from DOE, the manpower planning for the RCS Operations will be included in the O&M manpower plan under Activity No. 101000, entitled, "Operations."

The duration of the RCS Operations activity is approximately eight (8) weeks. It begins with the current forecasted start of demobilization of the AWR Project Contractor and ends with the beginning of the Silos 1 and 2 Project treatment operations.

7.2) Quantification - RCS Operations and TTA Maintenance

The operation of the RCS is 24 hours/day for eight (8) weeks. Table 1.5-81 summarizes the shift coverage for the RCS O&M crews. Continuous operation only requires working one (1) dayshift crew, 10 hours per day, 4 days per week. Off-shift coverage will be provided by the AWWT control room. Similarly, maintenance of the TTA will be conducted by one (1) dayshift crew on a 10 hours per day 4 days per week basis.

TABLE 1.5-81
 SHIFT COVERAGE SUMMARY

SHIFT	SHIFT COVERAGE (NO. CREWS)		
	CR	CMS	MAINT.
DAY	1	1	1

Based upon the Silos 1 and 2 work crew designations and the operations work schedule, a manpower staffing plan has been developed to ensure that all RCS operations are adequately staffed. The following Tables 1.5-82 through 1.5-84 summarize the Silos 1 and 2 O&M staffing plan by work crew.

**TABLE 1.5-82
 CR CREW SUMMARY**

SHIFT	CREW ID NO.	MANPOWER RESOURCE CODE (FTE)			
		OPSMGR	ENGPRC	CHMOPR	RADTEC
DAY	A1-CR	1	1	2	3
TOTAL RESOURCES		1	1	2	3

**TABLE 1.5-83
 CMS CREW SUMMARY**

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SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)					
		CRPNTR	MCHNST	OILER	PAINTR	RIGGER	WELDER
DAY	A1	0.2	0.1	0.2	0.1	1.0	0.2

**TABLE 1.5-84
 SHIFT MAINTENANCE CREW SUMMARY**

SHIFT	CREW NO.	MANPOWER RESOURCE CODE (FTE)				
		MNTMGR	ELECTN	INSMEC	MILWRT	PIPFTR
DAY	A1	1	3	3	3	3

The OT labor for the RCS crew is included in the Silos 1 and 2 Project Summary in Table 1.5-79.

Other Direct Costs

The resources planning for the RCS Operations also includes the need for the following consumable items and services which are considered "other direct costs." Table 1.5-85 summarizes these items and their costs.

**TABLE 1-5-85
 OTHER DIRECT COSTS - RCS OPERATIONS**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
1	LABORATORY SERVICES (LIQUID AWWT ACCEPTANCE CRITERIA)	1 wastewater sample/month (of filtrate prior to discharge to AWWT)	\$3,000
		2 samples collected and analyzed	
		Analyte suite attached	
		\$1,500/sample assumed	
2	LABORATORY SERVICES (STACK FILTER PAPER)	1 air filter paper sample (biweekly)	\$6,000
		4 samples	
		Analyte suite attached	
		\$1,500/sample	
3	LABORATORY SERVICES (OSHA COMPLIANCE SAMPLES)	Breathing Zone, Area Monitors	\$8,200
		Filter Media Analysis for:	
		• 7-metals (\$100 ea)	
		• 5-organic (\$100 ea)	
		• 4-particulate (\$20 ea)	
• 4-silica (\$90 ea)			
5X to estimate sample handling costs			
SUBTOTAL LABORATORY SERVICES			\$17,200
PPE EQUIPMENT			
4	TYVEKS	Tyvek coverall-units Hood Coverall	\$200
		25 units/month	
		2 months	
		\$4/unit	
5	RUBBER BOOTIES	12 in. 20 mil latex Model 10241 boot/shoecover ARAMSCO, pg 16	\$200
		25 units/month for 2 months	
		\$4/unit	
6	BUBBLE SUITS	Bubblesuit with hood Qty (10)	\$1,070
		\$42/suit, \$65/hood	
		\$107/unit	

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**TABLE 1.5-85
 OTHER DIRECT COSTS - RCS OPERATIONS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
7	PAPR (WITH FILTERS)	PAPRs with belts	\$14,700
		ARAMSCO, ISI Typhoon, pg 35	
		20 units @ \$500/unit	
		20 battery packs @ \$175/pk	
		20 battery chargers @ \$60/unit	
		1,200 HEPA filters (20/day x 30 days/month x 2 months) \$6 each (Model P-100)	
8	APR (WITH FILTERS)	APRs	\$2,800
		Qty (20) @ \$140/each	\$24,000
		Respirator Cartridges	
		2 Cartridges per set	
		1 set/person	
		20 person/day	
		2 months	
		\$20/set of cartridges	
9	POCKET DOSIMETER	Qty (24) @ \$50 each	
10	LEAD BLANKETS	Qty (6)	\$600
		Lead wool blankets (12" x 48")	
		\$100 each	
Sales Tax PPE Equipment (6%)			\$3,120
SUBTOTAL PPE EQUIPMENT			\$55,090
MISCELLANEOUS			
11	MISCELLANEOUS	Operation & maintenance of RCS for 2 months	\$5,000
		Leather palm gloves, tape, bags, B-Z filters, Gamlox, hoses, buckets, Carhans, sorbents, glasses, etc.	
12	BOTTLED WATER	\$3.50/bottle (stores item)	\$140
		Consumption rate = 20 bottles/month for 2 months	
		Cost = (3.50 x 20 x 2) = \$1,680	
Sales Tax Miscellaneous Equipment (6%)			\$310
SUBTOTAL MISCELLANEOUS EQUIPMENT			\$5,450

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**TABLE 1-5-85
 OTHER DIRECT COSTS - RCS OPERATIONS (CONT'D)**

ITEM NO.	DESCRIPTION	BASIS FOR COST	COST (\$)
TRAILER LEASES			
13	MONTHLY LEASE OF TRAILER NOS. 414 AND 415	Lessor: William Scotsman, Inc	\$2,080
		Trailer 414, Lease \$290/month for 2 months	
		Trailer 415, Lease \$750/month for 2 months	
SUBTOTAL TRAILER LEASES			\$2,080

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1.5.11 HS1AM - Waste Management

The management of the treated Silos 1 and 2 material and secondary wastes will involve the following activities:

- Container Acquisition;
- Container Management;
- Waste Disposition;
- Container Staging;
- Container Transportation;
- Disposal.

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The following sections identify the scope, schedule, and resources for each of the activities and the charge numbers, as well as the earned value methods that will be used to measure and report progress.

1) Task #1 - Container Acquisition

1.1) Plan/Scope - Container Acquisition

The treated Silos 1 and 2 material will be packaged in approximately 6,000 custom designed containers, manufactured by one or more vendors under the terms and conditions of a fixed unit price, indefinite duration/indefinite quantity contract. The Silos 1 and 2 Site Engineering team will prepare an IFB package using the container design package developed in Section 1.5.3.4. The IFB package will consist of two (2) parts, a base contract to demonstrate vendor(s) capability and qualifications through the manufacturing and testing container prototypes to project specifications; and a contract option to authorize the qualified vendors to manufacturer a minimum quantity of containers at a fixed unit price. Multiple contracts may be awarded for the manufacture of the Silos 1 and 2 containers.

The schedule for the preparation and award of the Silos 1 and 2 container IFB package is summarized by Activity Hammock No. 102300, entitled, "Container IFB Package." The duration of this activity is 207 workdays. Table 1.5-86 summarizes the Container IFB Package activities and the milestones for reporting earned value.

The schedule for the manufacturing and testing of prototype containers and the award of contracts to manufacture containers is summarized by Activity Hammock No. 122323, entitled, "Manufacturer Prototypes and Test." The duration of this activity is 211 work days. Table 1.5-87 summarizes the container manufacturing contract process and the milestones for reporting earned value.

**TABLE 1.5-86
 SCHEDULE SUMMARY—CONTAINER IFB PACKAGE**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
102300	Container IFB Package (Hammock)	207	-
102302	Prepare Container IFB	30	25%
102304	Review Container IFB	20	-
102308	Revise Container IFB	20	50%
102312	CRB Review Container IFB	5	-
102314	Incorporate CRB IFB Review Comments	10	-
102316	DOE Review Container IFB	20	75%
102318	Revise and Issue Container IFB to Vendors	10	-
102320	Issue Container IFB to Vendors	0	-
102322	Vendor Prepare and Submit Bid	20	85%
102326	Prebid Conference with Vendors	1	-
102340	Prepare Container Consent Package(s)	15	-
102342	CRB Review Container Consent Package(s)	10	-
102344	Incorporate CRB Review Comments	5	90%
102346	DOE FEMP Review Consent Package(s)	20	-
102348	Fluor Fernald Revise Consent Package(s)	10	95%
102350	DOE HQ Review Consent Package(s)	20	-
102352	Revise Consent Package(s) & DOE Approve	10	-
102354	Fluor Fernald Award Container Contract(s)	1	100%

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TABLE 1.5-87
SCHEDULE SUMMARY — MANUFACTURE PROTOTYPES AND TEST

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
122323	Manufacturer Prototypes and Test	211	-
122325	Container Contractor(s) Prototyping	61	25%
122350	Testing Containers	150	50%
122375	Container Test Report	70	75%
122400	Fluor Fernald Issue Authorization to Manufacture Containers	0	100%

TABLE 1.5-88
SCHEDULE SUMMARY — CONTAINER CONTRACTS

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WEEKS)	MILESTONE
122405	Fabricate Container(s)	625	-

1.2) Quantification Container Acquisition

IFB Package

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~~The Silos 1 and 2 Site Engineering Team will prepare the container IFB Package. The IFB Package will be reviewed by Duratek and selected Fluor Fernald personnel, including team members from Waste Generator Services, Acquisitions, and Engineering Services. Table 1.5-89 summarizes the ODC resources for the preparation and award of the IFB Package. The resources will be managed and reported under Charge No. HS1AA.~~

Manufacture and Test Prototypes

~~The Silos 1 and 2 Site Engineering Team and selected Duratek and Fluor Fernald personnel will oversee the implementation of the container manufacturing contract(s). It is assumed that up to four (4) contracts could be awarded to qualified vendors to manufacture the Silos 1 and 2 containers. Table 1.5-90 summarizes the ODC resources for the support of the manufacturing and testing of prototype containers. These resources will be managed and reported under Charge No. HS1AA.~~

Fabricate Containers Oversight and Management

~~The Silos 1 and 2 Site Engineering Team will provide technical support to the oversight and management of the container manufacturing contracts. It is assumed that four (4) contracts will be awarded to qualified vendors to manufacturer the Silos 1 and 2 containers. The containers for the treated Silos 1 and 2 material will have a performance grade of three (3) and will require commensurate level of QA inspections and surveillances. Table 1.5-91 summarizes the ODC resources for the oversight and management of the container fabrication contracts. The container contracts will be managed and reported under Charge No. HS1AA.~~

Contractors will submit a container production schedule and delivery schedule based upon their capabilities and capacity. Contractors will submit monthly invoices for the containers that have been received and passed inspection by the Silos 1 and 2 Project personnel. Reporting earned value for the container contracts will be quantity based. Labor for the oversight and management of the container contracts will be apportioned based upon the percentage of containers received against the baseline total of 6,000 containers required. Resources for the manufacture of the containers will be managed and reported under Charge No. HS1AA.

TABLE 1.5-89
RESOURCE SUMMARY — CONTAINER IFB PACKAGE

RESOURCE CODE	ACTIVITY NO. 102300 (IFE)
ODGs	
FEDEX	\$1,000
TRAVEL (10 TRIPS, MED. SOUTH)	\$12,500
TOTAL	\$13,500

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TABLE 1.5-90
RESOURCE SUMMARY — MANUFACTURE AND TEST PROTOTYPE CONTAINERS

RESOURCE CODE	ACTIVITY NO. 122323 (IFE)
ODGs	
FEDEX	\$1,000
TRAVEL: VENDOR PRETEST TRIPS — 4 TRIPS (MEDIUM)	\$5,000
TRAVEL: WITNESS FABRICATION — 12 TRIPS (MEDIUM)	\$15,000
TRAVEL: WITNESS TESTS — 20 TRIPS (MEDIUM)	\$25,000
TRAVEL: SURVEILLANCES — 8 TRIPS	\$18,000
TOTAL	\$54,000

TABLE 1.5-91
RESOURCE SUMMARY — FABRICATE CONTAINERS

RESOURCE CODE	ACTIVITY NO. 122405 (IFE)
ODGs	
FEDEX (\$100/MONTH)	\$3,000
TRAVEL (SURVEILLANCES, AUDITS, PROBLEMS, MEDIUM TRIPS (4/MONTH) FOR THIRTY MONTHS)	\$150,000 (\$5,000/MONTH)
TOTAL	\$153,000

~~2) Task #2 Container Management~~

~~2.1) Plan/Scope Container Management~~

~~The Silos 1 and 2 containers will be manufactured over a period of 2.5 years (625 work days). The containers will be received and inspected by the Silos 1 and 2 O&M Waste Management personnel. The containers will be received and staged in an area adjacent to the Silos 1 and 2 Project area, until they are transferred to the Silos 1 and 2 remediation facility for preparation and introduced into the treatment process. The scope, schedule, and resources for the Silos 1 and 2 container management activities is managed and reported under Activity Hammock No. 122403, entitled, "Container Management." Earned value will be apportioned based upon the percentage of containers received against the baseline total of 6,000 containers required.~~

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~~2.2) Quantification Container Management~~

~~O&M resources for the receipt of the containers are planned under Operations (Charge No. HS1AL). It is assumed that containers will only be received on day shift, 8 hours/day, 5 days/week. It is assumed that delivery of the containers will not begin until the second quarter of FY 05.~~

~~3) Task #3 Waste Certification~~

~~3.1) Plan/Scope Waste Certification~~

~~In accordance with PL 3067, Fluor Fernald Waste Certification Program Plan, Waste Generator Services personnel will verify that the treated Silos 1 and 2 material meets the NTS WAC for disposal. The analytical data from the composited sample of each days' batches will be processed by Waste Generator Services and the Waste Acceptance Organization. Only containers that have been certified to pass the NTS WAC will be released and readied for shipment to the NTS.~~

~~Transportation personnel will prepare the shipping manifests for each waste shipment. The actual transportation contract is discussed in Section 1.5.11.~~

The scope, schedule, and resources for this effort are planned under Activity No. 113900, entitled, "Waste Disposition." The resources for this effort will be managed and reported under charge number HS1AM. Earned value for the labor resources will be apportioned monthly based on the percentage of containers shipped out of the baseline 6,000 containers.

The duration of the "Waste Disposition" activity is 310 workdays. Waste disposition activities will begin following the production of the first container and will last until all the Silos 1 and 2 material has been treated.

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3.2) Quantification Waste Certification

The resources for this effort were developed using the manpower planning software spreadsheets provided by Waste Generator Services. The spreadsheets were tailored to reflect the Silos 1 and 2 Project container concept and sampling scheme. The resources summarized in Table 1.5-92 are based upon a total of 6,000 containers of treated Silos 1 and 2 material requiring shipment and disposal. It is assumed that 1% or 60 containers will fail to meet the NTS WAC and require additional handling (i.e., macroencapsulation) prior to final disposal.

TABLE 1.5-92
RESOURCE SUMMARY — SILOS 1 AND 2 TREATED WASTE DISPOSITION

RESOURCE CODE	113900 TOTAL RESOURCES (FTEs)	
	CREW 1	CREW 2
Labor		
HAZWAT	3	3
MVOOPR	1	1
HEOOPR	3	3
TRNLBR	4	4
OPRMGR	1	1
RADTECH	2	2
QACTEC	3	3
WSTENG	4	4
PJSREP	1	1
ODGs		
FULL ANTI-C'S @ \$9.68 EACH	\$5,191	\$1,042
NORMAL PPE	\$56,793	\$574
VEHICLE RENTAL	\$138,031	\$2,681
OTHER MATERIALS @ \$240 EACH	\$1,425,600	\$14,400
SHORING @ \$100 EACH	\$297,000	\$6,000
TOTAL	\$1,922,777	\$24,697

The resources are based on shipping waste containers seven (7) days a week only during dayshifts. The waste disposition team consists of two (2) dayshift crews working a rotation of four (4) 12-hour per day workweeks, to support the seven (7) day shipping schedule. Table 1.5-93 summarizes the OT and DT requirements for shipping at this work schedule.

**TABLE 1.5-93
 SILOS 1 AND 2 WASTE DISPOSITION OVERTIME SUMMARY**

RESOURCE CODE	OVERTIME MANHOURS		
	OT	DT	TOTAL
OPRMGR	3,584	1,344	4,928
WSTENG	3,584	1,344	4,928
HAZWAT	10,752	4,032	14,784
HEOOPR	10,752	4,032	14,784
RADTEC	7,168	2,688	9,856
MVOOPR	3,584	1,344	4,928
TRNLAB	14,336	5,376	19,712
QACTEC	10,752	4,032	14,784
TOTAL	64,512	24,192	88,704

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4) Task #4 Container Staging

Upon release of the containers from the treatment process, a heavy duty forklift (i.e., Taylor) will be used to transport the Silos 1 and 2 waste containers to the container staging area. The containers will be staged in an outdoor area prior to their loading onto trucks for transport to the NTS. The staging area will be nominally sized to accommodate the temporary storage of up to 48 containers, two (2) days worth of production at a rate of twenty four (24) containers per day. The configuration of the staged containers will utilize a combination of distance and shielding to maintain worker exposure consistent with ALARA principles. The scope, schedule, and resources for this effort are planned under activity No. 101000, entitled, "Operations."

5) Task #5 Transportation

The treated Silos 1 and 2 material will be transported to the NTS by direct truck shipment. It is currently estimated that a total of 6,000 containers of treated Silos 1 and 2 material will be generated based on the targeted treatment formulation range of 20-30 wt%. It is assumed that only two of these containers can be transported per truck shipment in order to comply with Department of Transportation regulations, resulting in 3,000 truck shipments for the project.

~~The project is being baselined on the assumption that the shipment of the packaged waste to the NTS will be performed within a two (2) day period following their production. It is assumed that the transportation and treatment processes will be managed under a "steady state" condition. That is, as containers of treated waste are generated at a rate of twenty four (24) per day, they are also being shipped to the NTS at a rate of twenty four (24) per day.~~

~~At this required shipment rate, the logistics are significant and complex. A dedicated transportation team will be assembled to ensure that the waste is transported offsite as required. Based upon historical shipping performance at the FEMP, multiple contracts for transportation carriers will be required to ensure that an adequate supply of trailers, trucks and drivers are available to support the effort. The scope, schedule, and resources for the establishment and implementation of transportation carrier contracts will be managed by the following three (3) key activities:~~

- ~~1) Prepare Transportation RFP;~~
- ~~2) Bid and Award Transportation RFP; and~~
- ~~3) Transportation Contract Management.~~

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~~The resources for the preparation of the RFP and Bid and Award process will be managed under charge number HS1AC. Oversight and management of the contract will be managed under HS1AA. The resources for the transportation contractor will be managed and reported under charge number HS1AT. The following sections describe the scope, schedule, and planned resources for these activities.~~

~~5.1) Subtask #1 Prepare Transportation RFP~~

~~5.1.1) Plan/Scope Prepare Transportation RFP~~

~~Consistent with the Silos 1 and 2 Contracting Strategy, the Silos 1 and 2 Site Engineering team will prepare a performance specification to secure the services of a qualified contractor (or contractors) under the terms and conditions of a Fixed Unit Price contract(s) for the transportation of the treated Silos 1 and 2 material and other waste streams to the NTS for disposal. The performance specification will be prepared consistent with the EPA-approved Silos 1 and 2 TDP (Section 1.5.3.5.6).~~

~~The Silos 1 and 2 Site Engineering Team in consultation with the FEMP Transportation, Acquisitions, and Waste Generator Services will prepare the RFP. The RFP will be prepared consistent with the Standard Services Contract pursuant to the FEMP Procedure No. CT-2.1.1., Rev. 11.~~

The preparation of the Silos 1 and 2 Transportation RFP will begin shortly after the Silos 1 and 2 TDP is approved by the EPA and OEPA. The preparation of the Silos 1 and 2 Transportation RFP will take 115 workdays and is represented by Activity Hammock No. 122498, entitled "Prepare Transportation RFP Package." Table 1.5-94 provides a schedule summary of the Transportation RFP preparation activities and the milestones for reporting progress.

**TABLE 1.5-94
 SCHEDULE SUMMARY FOR THE PREPARATION OF THE TRANSPORTATION RFP**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
122498	Prepare Transportation RFP Package (hammock)	115	-
122502	Prepare Transportation RFP	30	40%
122504	Review Transportation RFP	20	50%
122506	Revise Transportation RFP	20	70%
122508	CRB Review Transportation RFP	5	-
122510	Incorporate CRB Comments	10	80%
122512	DOE Review Transportation RFP	20	90%
122514	Revise and Issue Transportation RFP to Vendors	10	100%

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5.1)2 Quantification - Prepare Transportation RFP

Table 1.5-95 provides a resource summary of the planned resources for the preparation of the Silos 1 and 2 Transportation RFP. The planned resources include provide DOE FEMP a draft copy of the RFP for review in parallel to Fluor Fernald review of the draft RFP. The formal DOE review of the RFP is planned for twenty (20) workdays. This review includes all DOE organizations including DOE FEMP, DOE OH, DOE HQ, and DOE NV.

**TABLE 1.5-95
 RESOURCE SUMMARY - PREPARATION OF THE TRANSPORTATION RFP**

RESOURCE CODE	ACTIVITY NUMBER							TOTAL RESOURCES
	122502	122504	122506	122508	122510	122512	122514	
ODCs								
FEDEX	-	\$100	-	-	-	\$100	-	\$200
TOTAL	-	\$100	-	-	-	\$100	-	\$200

5.2) Subtask #2 Bid and Award Transportation Contract

5.2)1 Plan/Scope Bid and Award Transportation Contract

The RFP for the Silos 1 and 2 Transportation activities will be released to vendors for a period of 40 days. A source evaluation board (SEB) will be convened to evaluate the technical and cost proposals. Vendors will be given an opportunity to submit best and final offers (BAFOs) prior to completing vendor selections. Multiple contracts may be awarded. The Silos 1 and 2 Site Engineering team will prepare a consent package(s) for DOE review and approval prior to awarding the contract(s).

The bid and award of the Silos 1 and 2 Transportation RFP will take 151 days and is represented by Activity Hammock No. 122500, entitled, "Bid and Award Transportation RFP." Table 1.5-96 provides a schedule summary of the Transportation RFP Bid and Award activities and the milestones for reporting progress.

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**TABLE 1.5-96
 SCHEDULE SUMMARY FOR THE BID AND AWARD OF THE TRANSPORTATION RFP**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
122500	Bid and Award Transportation RFP Package (hammock)	151	
122518	Vendors Prepare & Submit Proposal	40	25%
122520	Assemble SEB	20	30%
122522	Prebid Conference with Vendors	1	-
122524	SEB Evaluate Proposals	15	50%
122526	Vendors Prepare and Submit BAFOs	10	-
122528	SEB Completes Evaluation	5	70%
122530	Prepare Consent Package(s)	10	80%
122532	CRB Review Consent Package(s)	5	-
122534	Incorporate CRB Comments	5	85%
122536	DOE FEMP Review Consent Package(s)	20	-
122538	Fluor Fernald Revise Consent Package(s)	10	-
122540	DOE HQ Review Consent Package(s)	20	90%
122542	Revise Consent Package(s) and DOE Approve	10	-
122544	Fluor Fernald Awards Contract(s)	1	100%

5.2)2 Quantification Bid and Award Transportation Contract

Table 1.5-97 provides a resources summary of the planned resources for the bid and award of the Silos 1 and 2 Transportation RFP.

**TABLE 1.5-97
 RESOURCE SUMMARY BID AND AWARD TRANSPORTATION RFP**

RESOURCE CODE	ACTIVITY NUMBER												TOTAL RESOURCES
	012100	022100	032100	042100	052100	062100	072100	082100	092100	102100	112100	122100	
ODCs													
FEDEX	-	-	-	\$100	-	-	-	-	-	\$100	\$100	\$100	\$400
TOTAL	-	-	-	\$100	-	-	-	-	-	\$100	\$100	\$100	\$400

5.3) Subtask #3 Transportation Contract Management

5.3)1 Plan/Scope Transportation Contract Management

Fluor Fernald will perform oversight and management of the transportation contractor(s) to ensure that the contractual requirements being followed and the obligations of the contractor(s) are being fulfilled. Contract management includes:

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- Submittals review and approval;
- Contract modifications;
- Quality assurance surveillances;
- Invoicing; and
- Progress reporting.

The period of performance of this contract will be indefinite to ensure that required transportation support is available throughout operations.

5.3)2 Quantification Transportation Contract Management

The resources for the management of the transportation contract(s) is reported under Activity No. 122546, entitled "Transportation Contracts." Table 1.5-98 summarizes the resources for this effort.

TABLE 1.5-98
RESOURCES SUMMARY — TRANSPORTATION CONTRACT MANAGEMENT

RESOURCE CODES	ACTIVITY HAMMOCK NO. 122546 TOTAL RESOURCES (FTEs)
OTHER DIRECT COSTS	
CONTRACTOR A	\$TBD
CONTRACTOR B	\$TBD
CONTRACTOR C	\$TBD
CONTRACTOR D	\$TBD
TOTAL CONTRACTS	\$13,938,000

The other direct costs include the transportation contract values which will sum up to a total of \$13,938,000.00. This value is based on a total quantity of 3,060 shipments at an average rate of \$4,600/shipment as follows:

- ~~2,970 shipments (two containers); and~~
- ~~60 shipments (single containers).~~

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The contractors will invoice on a monthly basis for completed shipments. The labor resources will be apportioned based on the percentage of shipments completed.

6) Task #6 — DOE Waste Disposal

The following ~~Table 1.5-99~~ summarizes the types and quantities of waste generated during the Silos 1 and 2 Project that will be disposed of at an off site disposal facility. DOE will need to fund the disposal of this waste in the respective fiscal years. Similarly, ~~Table 1.5-100~~ summarizes the types and quantities of waste generated during the Silos 1 and 2 Project that will be disposed of in the FEMP onsite disposal facility. Additional information on these wastestreams can be found in the referenced sections of this closure plan.

TABLE 1.5-99
SILOS 1 AND 2 PROJECT — OFF-SITE DISPOSAL AT THE NTS

ITEM NO.	REF.	WASTE TYPE	DESCRIPTION	EXTERNAL VOLUME (FT ³)	DISPOSAL COST (\$) (\$7.50/ft ³)	SCHEDULE	
						START	END
Operations							
1	1.5.10	Solid	Treated Silos 1 and 2 material (5940 containers)	1,247,000	9,355,500	11May06	10May07
2	1.5.10	Solid	Treated Silos 1 and 2 material (60 offspec containers)	14,100	105,750	11May06	10May07
3	1.5.10	Solid	Secondary waste (filters, spent parts; 12 white metal boxes)	1,344	10,080	11May06	10May07
Safe Shutdown							
4	1.5.11	Solid	Treated holdup material (1 container)	210	1,575	11May07	06May07
5	1.5.11	Solid	RCS Carbon	15,120	113,400	07Aug07	30Oct07
D&D							
6	1.5.12	Solid	Silo 1	38,080	285,600	18Aug06	06Jul07
7	1.5.12	Solid	Silo 2	38,080	285,600	18Aug06	06Jul07
8	1.5.12	Solid	Decant Sump Tank System	22,400	168,000	18Aug06	06Jul07
9	1.5.12	Solid	Silo 3 Remediation Facility (5 boxes)	560	4,200	18Aug06	06Jul07
10	1.5.12	Solid	Silos 1 and 2 Remediation Facilities (10% total)	28,560	214,200	07Aug07	28Feb08
11	1.5.12	Solid	RCS and TTA Facilities (10% Total)	140,000	1,050,000	07Aug08	28Feb08
TOTAL COST					\$11,593,905		

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It is assumed that during construction activities soil will be excavated. It is assumed that this excavated soil will meet the WAC for the OSDF and will be transported by dump truck to the OSDF for disposal. The unit cost for disposal of soil in the OSDF is \$30/yd³ which includes a unit cost of \$12.15/yd³ for excavation and \$17.85/yd³ for placement. Based on this information, the cost associated with excavation and disposal of 100 yd³ of contaminated soil is \$3,000.

TABLE 1.5-100
SILOS 1 AND 2 PROJECT — WASTE DISPOSAL SUMMARY — OSDF

ITEM NO.	REF. SECTION	DESCRIPTION	ROLLOFF BOXES (30yd ³ ea)	SCHEDULE	
				START	END
CONSTRUCTION					
1	1.5.8	Contaminated Soils Generated during Excavations of Remediation Facilities	2700 ft ³ (Dump Truck)	17 May 04	11 Apr 05
OPERATIONS					
2	1.5.10	Secondary Waste (Miscellaneous debris, PPE, spent consumables)	1	11 May 06	10 May 07
SAFE SHUTDOWN					
3	1.5.12	Secondary Waste (Miscellaneous debris, PPE, spent consumables)	1	11 May 07	30 Oct 07
D&D					
4	1.5.13	Silo 3 Structure Debris	35	18 Aug 06	06 Jul 07
5	1.5.13	Silo 4 Structure Debris	35	18 Aug 06	06 Jul 07
6	1.5.13	Silo 4 Superstructure Debris	30	18 Aug 06	06 Jul 07
7	1.5.13	Silo 3 Remediation Facility	79	18 Aug 06	06 Jul 07
8	1.5.13	RCS and TTA Facilities	1,111	18 Aug 06	06 Jul 07
9	1.5.13	RTS and Trench (N-S)	8	18 Aug 06	06 Jul 07
10	1.5.13	Concrete Blocks	15	07 Aug 07	28 Feb 08
11	1.5.13	Silos 1 and 2 Remediation Facility and Support Facilities	412	07 Aug 07	28 Feb 08

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1.5.12 — HS1AN Facility Shutdown

~~Fluor Fernald will perform safe shutdown activities to place the Silos 1 and 2 remediation and support facilities in a controlled state ready for dismantlement. Fluor Fernald will perform safe shutdown activities in accordance with the FEMP Collective Bargaining Agreement with the FAT&LC. FAT&LC personnel will be used to isolate all utilities to the facilities, remove gross quantities of hold up from existing equipment, ductwork, pipes, and sumps, and perform gross decontamination to prepare for dismantlement.~~

~~The scope, schedule, and resources for the Silos 1 and 2 Facility Shutdown effort will be managed by the following two (2) activities:~~

- ~~• Facility Shutdown Work Plan; and~~
- ~~• Facility Shutdown.~~

The schedule for all the facility shutdown activities is summarized under the Activity Hammock No. 100030, entitled "Safe Shutdown Oversight and Management." The following sections describe the scope, schedule, and resources for these key activities.

1) Task #1 Facility Shutdown Work Plan

1.1) Plan/Scope Facility Shutdown Work Plan

The Silos 1 and 2 Site Engineering team will prepare a Facility Shutdown Work Plan (FSWP), which will guide the facility shutdown activities. The content of the FSWP is defined in Appendix A, Section 3.0.

The preparation, review, and approval of this work plan will be tracked by the Activity Hammock No. 113898, entitled "Facility Shutdown Work Plan." The total duration of this activity is 180 days. Table 1.5-101 summarizes the schedule for the FSWP. Completion of the FSWP is a prerequisite for performing safe shutdown activities.

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**TABLE 1.5-101
 FACILITY SHUTDOWN WORK PLAN SCHEDULE**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113898	FSWP (Hammock)	180	-
113950	Fluor Fernald Prepare Draft FSWP	80	33%
113955	Fluor Fernald Review Draft FSWP	20	50%
113960	Fluor Fernald Revise Draft FSWP	40	56%
113965	DOE FEMP Review Draft FSWP	10	70%
113970	Fluor Fernald Revise FSWP	20	85%
113975	DOE FEMP Approve FSWP	10	100%

1.2) Quantification Facility Shutdown Work Plan

The FSWP will be prepared by the Fluor Fernald Silos 1 and 2 Site Engineering team members, and peer reviewed internally by selected Duratek Services and Fluor Fernald personnel. Fluor Fernald team members will address comments resulting from the peer review and DOE review cycles and revise the document accordingly. These resources are planned under Project Management (Charge No. HS1AA). The ODC resources for developing the FSWP are summarized in Table 1.5-102.

TABLE 1.5-102
SUMMARY OF RESOURCES FOR THE FACILITY SHUTDOWN WORK PLAN

RESOURCE CODE	ACTIVITY NUMBER						TOTAL RESOURCES
	113950	113955	113960	113965	113970	113975	
OTHER DIRECT COSTS							
FEDEX		\$100				\$100	\$200

2) Task #2 Facility Shutdown

2.1) Plan/Scope Facility Shutdown

The scope of the facilities requiring shutdown for the Silos 1 and 2 Project include the Silos 1, 2, 3, and 4, TTA, RCS, Maintenance Shop, trailers supporting the Silos Project, and the new facilities constructed to support the treatment and disposal of the Silos 1 and 2 material. The Facility Shutdown activities will include the following activities:

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Isolation of Utilities (EIP)

Fluor Fernald will isolate all utilities including, but not limited to, electric power, steam, water, and compressed air from the facilities. Fluor Fernald will develop an EIP within the Facility Shutdown Plan that describes when, where, and how, the utilities will be isolated.

Utilities will be safely disconnected outside the facility early in the facility shutdown process, by physically cutting, air gapping, and tagging the lines. Fluor Fernald will remove all grounding conductors to grade level. Fluor Fernald will verify that all utilities are capped and/or controlled and notify the Assistant Emergency Duty Officer of the completion of utilities isolation.

Establish Temporary Utilities

Fluor Fernald will be responsible for the following:

- ~~Extend the power from the point source location or provide portable generators;~~
- ~~All electrical appurtenances required for temporary power shall be in accordance with the National Electrical Code;~~
- ~~Temporary heating or cooling, if needed, will be provided. All portable heaters will be Underwriters Laboratory listed or American Gas Association certified for their intended use and not modified for other applications. Ventilation for fuel-fired heaters and adequate clearance to combustible materials, surfaces, and furnishings~~

~~shall be provided according to manufacturer's recommendations. Use of Liquid Propane Gas gas-fired heaters will be approved by the FEMP Fire Protection group. All portable continuous running of gas-fired heating systems require 24-hour coverage by the project.; and~~

- ~~Extend the water from the point source location to support operations.~~

Removal of Hold Up Material

~~The interior of all equipment, piping, ductwork, tanks, and sumps will be assessed to determine whether they contain loose and/or visible hold-up material. Loose is defined as material that is considered releasable through a credible accident. If the item contains loose or visible material, the material shall be removed in accordance with FEMP approved Safe Work Plans and properly treated and packaged for disposal.~~

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Gross Decontamination

~~Fluor Fernald will perform gross decontamination of the remaining equipment and the interior of the treatment facility. Gross decontamination is defined as general housekeeping to remove contaminated debris, vacuum loose dust, wet wipe equipment, ductwork, piping, and the interior of the structure walls, and remove loose, visible residues.~~

Treatment of Hold Up Material

~~It is assumed that the removal of hold-up material will be logically planned so that the material can be flushed and processed forward or manually transferred into a final batch in the mixer before the equipment is disconnected.~~

Facility Shutdown

~~The Facility Shutdown activities will be divided into two (2) phases. Phase I activities will include:~~

- ~~Hold up material from all equipment, piping, ductwork, tanks, and sumps, including the TTA systems will be removed and treated, as required, to meet the NTS WAG.~~
- ~~Fluor Fernald will remove contamination on equipment, materials or debris using methods that minimize the generation of secondary waste.~~
- ~~All process equipment and support systems will be flushed to remove loose contaminants and process residues. Equipment and systems will then be drained and dried in preparation for dismantlement. Wastewater will be collected, staged, sampled, and treated, as necessary to meet the discharge requirements of AWWT facility prior to discharge to the AWWT. Sampling and analysis activities will be~~

~~performed on wastewater to verify compliance with the AWWT discharge requirements.~~

- ~~The RCS will be isolated for a period up to 45 calendar days to allow sufficient time for the natural decay of the radon remaining in the carbon beds. Because of fine particulate present in the carbon beds, the 160,000 pounds of carbon in the carbon beds will be transferred into 55-gallon drums and packaged into a six-pack overpack container for disposal at the NTS. Assuming a density of 30 lbs/ft³, it will take 800 drums and 135 six-pack overpack containers to package the carbon for disposal at the NTS.~~

~~Phase II activities will focus upon:~~

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- ~~Isolation of all utilities supporting all the remediation and support equipment, systems, etc.;~~
- ~~Establish temporary utilities to support dismantlement;~~
- ~~Excessing of all trailers, furniture, etc.; and~~
- ~~Remove carbon from the RCS and RTS.~~

~~The facility shutdown activities will begin immediately following the completion of Operations (Activity No. 101000) and the completion of the FSWP (Activity No. 113898).~~

~~The Facility Shutdown Activity Hammock No. 113909 will be 120 days in duration, Phase I is planned for 60 days and Phase II is planned for 60 days. Table 1.5-103 summarizes the Facility Shutdown Schedule.~~

**TABLE 1.5-103
 SUMMARY SCHEDULE FOR THE FACILITIES SHUTDOWN**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113909	Facility Shutdown	120	-
113904	Facility Shutdown Phase I	60	50%
113905	Facility Shutdown Phase II	60	100%

1.5.11HS1AM - Waste Management

~~The management of the treated Silos 1 and 2 material and secondary wastes will involve the following activities:~~

- ~~Container Acquisition;~~
- ~~Container Contracts;~~
- ~~Waste Disposition;~~

- Container Transportation, and
- Disposal.

The following sections identify the scope, schedule, and resources for each of the activities and the charge numbers, as well as the earned value methods that will be used to measure and report progress.

1) Task #1 - Container Acquisition

1.1) Plan/Scope - Container Acquisition

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The treated Silos 1 and 2 material will be packaged in approximately 7,500 custom designed containers, manufactured by one or more vendors under the terms and conditions of a fixed-unit price, indefinite duration/indefinite quantity contract. The Silos 1 and 2 Site Engineering team will prepare an IFB package using the container design package developed in Section 1.5.3, Task 4. The IFB package will consist of two (2) parts. The first part is a base contract to demonstrate vendor(s) capability and qualifications through manufacturing and testing container prototypes to project specifications. The second part is a contract option to authorize the qualified vendors to manufacture a minimum quantity of containers at a fixed-unit price. Multiple contracts may be awarded for the manufacture of the Silos 1 and 2 containers.

The schedule for the preparation and award of the Silos 1 and 2 container IFB package is summarized by Activity Hammock No. 102300, entitled, "Container IFB Package." The duration of this activity is 207 workdays. Table 1.5-86 summarizes the Container IFB Package activities and the milestones for reporting earned value.

The schedule for the manufacturing and testing of prototype containers and the award of contracts to manufacture containers is summarized by Activity Hammock No. 122323, entitled, "Manufacturer Prototypes and Test." The duration of this activity is 211 workdays. Table 1.5-87 summarizes the container manufacturing contract process and the milestones for reporting earned value.

TABLE 1.5-86
SCHEDULE SUMMARY – CONTAINER IFB PACKAGE

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
102300	Container IFB Package (Hammock)	207	
102302	Prepare Container IFB	30	25%
102304	Review Container IFB	20	
102308	Revise Container IFB	20	50%
102312	CRB Review Container IFB	5	
102314	Incorporate CRB IFB Review Comments	10	
102316	DOE Review Container IFB	20	75%
102318	Revise and Issue Container IFB to Vendors	10	
102320	Issue Container IFB to Vendors	0	
102322	Vendor Prepare and Submit Bid	20	85%
102326	Prebid Conference with Vendors	1	
102340	Prepare Container Consent Package(s)	15	
102342	CRB Review Container Consent Package(s)	10	
102344	Incorporate CRB Review Comments	5	90%
102346	DOE-FEMP Review Consent Package(s)	20	
102348	Fluor Fernald Revise Consent Package(s)	10	95%
102350	DOE-HQ Review Consent Package(s)	20	
102352	Revise Consent Package(s) & DOE Approve	10	
102354	Fluor Fernald Award Container Contract(s)	1	100%

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TABLE 1.5-87
SCHEDULE SUMMARY – MANUFACTURE PROTOTYPES AND TEST

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
122323	Manufacturer Prototypes and Test	211	
122325	Container Contractor(s) Pretesting	61	25%
122350	Testing Containers	150	50%
122375	Container Test Report	70	75%
122400	Fluor Fernald Issue Authorization to Manufacture Containers	0	100%

TABLE 1.5-88
SCHEDULE SUMMARY – CONTAINER CONTRACTS

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
122405	Fabricate Container(s)	625	

1.2) Quantification - Container Acquisition

IFB Package

The Silos 1 and 2 Site Engineering Team will prepare the container IFB Package. The IFB Package will be reviewed by Duratek and selected Fluor Fernald personnel, including team members from Waste Generator Services, Acquisitions, and Engineering Services. The labor resources are planned and managed under HS1AA. Table 1.5-89 summarizes the ODC resources for the preparation and award of the IFB Package. The ODC resources will be managed and reported under Charge No. HS1AM.

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Manufacture and Test Prototypes

The Silos 1 and 2 Site Engineering Team and selected Duratek and Fluor Fernald personnel will oversee the implementation of the container manufacturing contract(s). These labor resources are planned and managed under HS1AA. It is assumed that up to four (4) contracts could be awarded to qualified vendors to manufacture the Silos 1 and 2 containers. Table 1.5-90 summarizes the ODC resources for the support of the manufacturing and testing of prototype containers. These ODC resources will be managed and reported under Charge No. HS1AM.

Container Contract Oversight and Management

The Silos 1 and 2 Site Engineering Team will provide technical support to the oversight and management of the container manufacturing contracts. These labor resources are planned and managed under HS1AA. It is assumed that four (4) contracts will be awarded to qualified vendors to manufacture the Silos 1 and 2 containers. It is assumed that the containers for the treated Silos 1 and 2 material will have a performance grade of three (3) and will require a commensurate level of QA inspections and surveillances throughout their manufacture and delivery. Table 1.5-91 summarizes the ODC resources for the oversight and management of the container fabrication contracts. These ODC resources will be managed and reported under Charge No. HS1AM.

**TABLE 1.5-89
 RESOURCE SUMMARY - CONTAINER IFB PACKAGE**

RESOURCE CODE	ACTIVITY NO. 102300
ODCS	
FEDEX	\$1,000
TRAVEL (10 TRIPS, MED. SOUTH)	\$12,500
TOTAL	\$13,500

TABLE 1.5-90
RESOURCE SUMMARY - MANUFACTURE AND TEST PROTOTYPE CONTAINERS

RESOURCE CODE	ACTIVITY NO. 122323
ODCs	
FEDEX	\$1,000
TRAVEL: VENDOR PRETEST TRIPS - 4 TRIPS (MEDIUM)	\$5,000
TRAVEL: WITNESS FABRICATION - 12 TRIPS (MEDIUM)	\$15,000
TRAVEL: WITNESS TESTS - 20 TRIPS (MEDIUM)	\$25,000
TRAVEL: SURVEILLANCES - 8 TRIPS	\$18,000
TOTAL	\$64,000

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TABLE 1.5-91
RESOURCE SUMMARY - CONTAINER CONTRACT OVERSIGHT AND MANAGEMENT

RESOURCE CODE	ACTIVITY NO. 122403
ODCs	
FEDEX (\$100/MONTH)	\$3,000
TRAVEL (SURVEILLANCES, AUDITS, PROBLEMS, MEDIUM TRIPS (4/MONTH) FOR THIRTY MONTHS)	\$150,000 (\$5,000/MONTH)
TOTAL	\$153,000

2) Task #2 - Container Contracts

2.1) Plan/Scope - Container Contracts

Consistent with the Silos 1 and 2 Contracting Strategy, the manufacture of the Silos 1 and 2 containers will be performed under the terms and conditions of indefinite delivery/indefinite quantity, fixed unit price contracts (Section 1.5-11, Task 1). It is planned that up to four (4) contracts will be awarded to ensure an adequate supply of containers to support the production schedule. For ease of reporting, these contracts will be tracked under the Charge No. HS1AU.

The Silos 1 and 2 containers will be manufactured over a period of 2.5 years (625 workdays) (Table 1.5-88). The scope, schedule, and resources for the Silos 1 and 2 container contract activities will be managed and reported under Activity Hammock No. 122405, entitled "Fabricate Containers". Earned value will be apportioned based upon the percentage of containers received against the baseline total of 7,500 containers required.

2.2) Quantification - Container Contracts

Container contractor contract values will be the only resource tracked under Charge No. HS1AU. It is estimated that the cost of each container will be \$3700, which includes delivery to the FEMP. The purchase of the containers is subject to a six percent (6%) sales tax. It is assumed that the container contracts will have a value of \$29,415,000 (\$27,750,000 containers + \$1,665,000 for sales tax) based on the need for 7,500 containers for the shipment of treated Silos 1 and 2 material to the NTS.

3) Task #3 - Waste Disposition

3.1) Plan/Scope - Waste Disposition

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In accordance with PL-3067, Fluor Fernald Waste Certification Program Plan, Waste Generator Services personnel will verify that the treated Silos 1 and 2 material meets the NTS WAC for disposal. The analytical data from the batches will be processed by Waste Generator Services and the Waste Acceptance Organization. Only containers that have been certified to pass the NTS WAC will be released and readied for shipment to the NTS.

Transportation personnel will prepare the shipping manifests for each waste shipment. The actual transportation contract is discussed in Section 1.5.11, Task 4.

The scope, schedule, and resources for this effort are planned under Activity No. 113900, entitled, "Waste Disposition". The resources for this effort will be managed and reported under charge number HS1AM. Earned value for the labor resources will be apportioned monthly based on the percentage of containers shipped out with respect to the baseline 7,500 containers.

The duration of the "Waste Disposition" activity is 310 workdays. Waste disposition activities will begin following the production of the first container and will last until all the Silos 1 and 2 material has been treated.

3.2) Quantification - Waste Disposition

The resources for this effort were developed using the manpower planning software spreadsheets provided by Waste Generator Services. The spreadsheets were tailored to reflect the Silos 1 and 2 Project container concept and sampling scheme. The resources summarized in Tables 1.5-92a and 1.5-92b are based upon a total of 7,500 containers of treated Silos 1 and 2 material requiring shipment and disposal. It is assumed that one percent or 75 containers will fail to meet the NTS WAC and require additional handling (i.e., macroencapsulation) prior to final disposal.

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TABLE 1-5-92a

RESOURCE LABOR SUMMARY - SILOS 1 AND 2 WASTE DISPOSITION

ACTIVITY NO. 113900

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Resource	FY-06		FY-07			
	Q3	Q4	Q1	Q2	Q3	Q4
HAZWAT	6	6	6	6	6	6
HEOOPR	6	6	6	6	6	6
MVOOPR	2	2	2	2	2	2
OPRMGR	3	3	3	3	3	3
PJSMGR	1	1	1	1	1	1
QACENG	1	1	1	1	1	1
QACTEC	6	6	6	6	6	6
RADTEC	4	4	4	4	4	4
TRNLAB	8	8	8	8	8	8
WSTENG	1	1	1	1	1	1
WSTENG	1	1	1	1	1	1
WSTMGR	0.5	0.5	0.5	0.5	0.5	0.5

TABLE 1.5-92B

RESOURCE ODC SUMMARY - SILOS 1 AND 2 WASTE DISPOSITION

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RESOURCE SUMMARY - SILOS 1 AND 2 TREATED WASTE DISPOSITION

RESOURCE CODE	113900 TOTAL RESOURCES	
	TREATED SILOS 1 AND 2 MATERIAL	OFF-SPECIFICATION SILOS 1 AND 2 MATERIAL
Labor (FTEs)		
HAZWAT	3	3
MVOOPR	1	1
HEOOPR	3	3
TRNLBR	4	4
OPRMGR	1	1
RADTECH	2	2
QACTEC	3	3
WSTENG	1	1
ODCs		
MACROENCAPSULATION (75 @ \$10,000 each)		\$750,000
FULL ANTI-C'S @ \$9.68 EACH	\$5,191	\$1,302
NORMAL PPE	\$70,992	\$717
OTHER MATERIALS @ \$240 EACH	\$1,782,000	\$18,000
SHORING @ \$100 EACH	\$371,300	\$7,500
SALES TAX (6%)	\$133,769	\$1,651
VEHICLE RENTAL	\$172,539	\$3,352
TOTAL	\$2,535,791	\$782,522

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The resources are based on shipping waste containers seven (7) days a week only during dayshifts. The waste disposition team consists of two (2) dayshift crews working a rotation of four (4) 12-hour per day workweeks, to support the seven (7) day shipping schedule. Table 1.5-93 summarizes the OT and DT requirements for shipping at this work schedule.

**TABLE 1.5-93
 SILOS 1 AND 2 WASTE DISPOSITION OVERTIME SUMMARY**

RESOURCE CODE	OVERTIME MANHOURS		
	OT	DT	TOTAL
OPRMGR	2,240	1,344	3,584
WSTENG	2,240	1,344	3,584
HAZWAT	6,720	4,032	10,752
HEOOPR	6,720	4,032	10,752
RADTEC	4,480	2,688	7,168
MVOOPR	2,240	1,344	3,584
TRNLAB	8,960	5,376	14,336
QACTEC	6,720	4,032	10,752
TOTAL	40,320	24,192	64,512

4) Task #4 - Transportation

Silos 1 and 2 Material

The treated Silos 1 and 2 material will be transported to the NTS by direct truck shipment. It is currently estimated that a total of 7,500 containers of treated Silos 1 and 2 material will be generated based on the targeted treatment formulation range of 15 wt%. Of this total, it is assumed that 7,425 containers will be produced that meet the NTS WAC, and one percent of the total (75 containers) will be produced that contain off-specification treated Silos 1 and 2 material.

Based on DOT and FEMP transportation requirements, it is assumed only two containers of the treated Silos 1 and 2 material can be transported per truck shipment to the NTS. This results in 3,713 truck shipments for this segment of the project. It is further assumed that the 75 containers of off-specification material will be required to be managed separately (i.e. overpacked, macroencapsulated) and transported individually to a disposal facility. The handling of the off-specification material is assumed to result in 75 single shipments.

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The project is being baselined on the assumption that the shipment of the packaged waste to the NTS will be performed within a two (2) day period following their production. It is assumed that the transportation and treatment processes will be managed under a "steady-state" condition. That is, as containers of treated waste are generated at a rate of thirty (30) per day, they are also being shipped to the NTS at a rate of thirty (30) per day.

D&D Debris

In addition, during this timeframe, transportation of packaged facility shutdown waste and D&D debris to the NTS will result in an additional 634 shipments to the NTS. (Section 1.5-11, Task 5).

At this required shipment rate, the logistics are significant and complex. A dedicated Silos 1 and 2 transportation team will be assembled to ensure that the waste is transported off-site as required. Based upon historical shipping performance at the FEMP, multiple contracts for transportation carriers will be required to ensure that an adequate supply of trailers, trucks, and drivers are available to support the effort. The scope, schedule, and resources for the establishment and implementation of transportation carrier contracts will be managed by the following three (3) key activities:

- 4) Prepare Transportation RFP;
- 5) Bid and Award Transportation RFP; and
- 6) Transportation Contract(s).

Oversight and management of the transportation contract(s) will be managed under HS1AA. The resources for the transportation contractor will be managed and reported under charge number HS1AT. The following sections describe the scope, schedule, and planned resources for these activities:

4.1) Subtask #1 Prepare Transportation RFP

4.1.1) Plan/Scope - Prepare Transportation RFP

Consistent with the Silos 1 and 2 Contracting Strategy, the Silos 1 and 2 Site Engineering team will prepare a performance specification to secure the services of a qualified contractor (or contractors) under the terms and conditions of a Fixed Unit Price contract(s) for the transportation of the treated Silos 1 and 2 material and other waste streams to the NTS for disposal. The performance specification will be prepared consistent with the EPA-approved Silos 1 and 2 TDP (Section 1.5.3, Task 5).

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The Silos 1 and 2 Site Engineering Team, in consultation with the FEMP Transportation, Acquisitions, and Waste Generator Services will prepare the RFP. The RFP will be prepared consistent with the Standard Services Contract pursuant to the FEMP Procedure No. CT-2.1.1, Rev. 11.

The preparation of the Silos 1 and 2 Transportation RFP will begin shortly after the Silos 1 and 2 TDP is approved by the EPA and OEPA. The preparation of the Silos 1 and 2 Transportation RFP will take 115 workdays. Preparation of the Transportation RFP is represented by Activity Hammock No. 122498, entitled "Prepare Transportation RFP Package." The planned schedule includes providing DOE-FEMP a draft copy of the RFP for review in parallel to Fluor Fernald review of the draft RFP. The formal DOE review of the RFP is planned for twenty (20) workdays. This review includes all DOE organizations including DOE-FEMP, DOE-OH, DOE-HQ, and DOE-NV. Table 1.5-94 provides a schedule summary of the Transportation RFP preparation activities and the milestones for reporting progress.

TABLE 1.5-94
SCHEDULE SUMMARY FOR THE PREPARATION OF THE TRANSPORTATION RFP

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
122498	Prepare Transportation RFP Package (Hammock)	115	
122502	Prepare Transportation RFP	30	40%
122504	Review Transportation RFP	20	50%
122506	Revise Transportation RFP	20	70%
122508	CRB Review Transportation RFP	5	
122510	Incorporate CRB Comments	10	80%
122512	DOE Review Transportation RFP	20	90%
122514	Revise and Issue Transportation RFP to Vendors	10	100%

4.1)2 Quantification - Prepare Transportation RFP

The resources for the preparation of the Transportation RFP are planned under Charge No. HS1AA. Table 1.5-95 provides a summary of the planned ODC resources for the preparation of the Silos 1 and 2 Transportation RFP.

TABLE 1.5-95
RESOURCE SUMMARY - PREPARATION OF THE TRANSPORTATION RFP

RESOURCE CODE	ACTIVITY NO. 122498	TOTAL RESOURCES
ODCs		
FEDEX		\$200
TOTAL		\$200

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4.2) Subtask #2 - Bid and Award Transportation Contract

4.2)1 Plan/Scope - Bid and Award Transportation Contract

The RFP for the Silos 1 and 2 Transportation activities will be released to vendors for a period of 40 days. A source evaluation board (SEB) will be convened to evaluate the technical and cost proposals. Vendors will be given an opportunity to submit best and final offers (BAFOs) prior to completing vendor selections. Multiple contracts may be awarded. The Silos 1 and 2 Site Engineering team will prepare a consent package(s) for DOE review and approval prior to awarding the contract(s).

The bid and award of the Silos 1 and 2 Transportation RFP will take 151 days and is represented by Activity Hammock No. 122500, entitled, "Bid and Award Transportation RFP." Table 1.5-96 provides a schedule summary of the Transportation RFP Bid and Award activities and the milestones for reporting progress.

TABLE 1.5-96
SCHEDULE SUMMARY FOR THE BID AND AWARD OF THE TRANSPORTATION RFP

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ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
122500	Bid and Award Transportation RFP Package (Hammock)	151	
122518	Vendors Prepare & Submit Proposal	40	25%
122520	Assemble SEB	20	30%
122522	Prebid Conference with Vendors	1	
122524	SEB Evaluate Proposals	15	50%
122526	Vendors Prepare and Submit BAFOs	10	
122528	SEB Completes Evaluation	5	70%
122530	Prepare Consent Package(s)	10	80%
122532	CRB Review Consent Package(s)	5	
122534	Incorporate CRB Comments	5	85%
122536	DOE FEMP Review Consent Package(s)	20	
122538	Fluor Fernald Revise Consent Package(s)	10	
122540	DOE HQ Review Consent Package(s)	20	90%
122542	Revise Consent Package(s) and DOE Approve	10	
122544	Fluor Fernald Awards Contract(s)	1	100%

4.2)2 Quantification - Bid and Award Transportation Contract

The labor resources for the Bid and Award Process will be managed under Charge No. HS1AC. Table 1.5-97 provides a summary of the planned ODC resources for the bid and award of the Silos 1 and 2 Transportation RFP.

TABLE 1.5-97
 RESOURCE SUMMARY - BID AND AWARD TRANSPORTATION RFP

RESOURCE CODE	ACTIVITY NO. 122500 TOTAL RESOURCES
ODCS	
FEDEX	\$400
TOTAL	\$400

4.3) Subtask #3 - Transportation Contract(s)

4.3.1 Plan/Scope - Transportation Contract(s)

Consistent with the Silos 1 and 2 Contracting Strategy, the transportation of the treated Silos 1 and 2 material and D&D debris to the NTS will be performed under a service contract. It is planned that up to four (4) transportation contracts may be awarded to ensure an adequate supply of trucks and trailers to ship the waste are provided to the project. For ease of reporting, these contracts will be tracked under Charge No. HS1AT.

The period of performance of the individual transportation contract will be indefinite to ensure that required transportation support is available throughout the entire operations and D&D activities. As part of its contract, the transportation contractor will be responsible for all maintenance of the trailers.

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The transportation resources will be managed and reported under two separate activities. Shipments of treated Silos 1 and 2 material are managed and reported under Activity Hammock No. 122570 entitled, "Operations Transportation Contract." Shipments of D&D debris are managed and reported under Activity Hammock No. 122575 entitled, "D&D Transportation Contract." Earned value will be reported monthly based on the number of shipments made during the given month.

4.3.2 Quantification - Transportation Contract Management

Fluor Fernald will perform oversight and management of the transportation contractor(s) to ensure that the contractual requirements are being followed and the obligations of the contractor(s) are being fulfilled. Contract management includes:

- Submittals review and approval;
- Contract modifications;
- Quality assurance surveillances;
- Invoicing; and
- Progress reporting;

The oversight and management of the transportation contract(s) is planned under Charge No. HS1AA. Only the resources for the value of the transportation contract(s) will be tracked and reported under Activity Nos. 122570 and 122575, entitled "Operations Transportation Contracts" and "D&D Transportation Contracts," respectively. Table 1.5-98 summarizes the resources for this effort.

TABLE 1-5-98
RESOURCES SUMMARY - TRANSPORTATION CONTRACT MANAGEMENT

RESOURCE CODES	OPERATIONS CONTRACT	D&D CONTRACT	TOTAL
	ACTIVITY HAMMOCK NO. 122570 TOTAL RESOURCES	ACTIVITY HAMMOCK NO. 122575 TOTAL RESOURCES	
SHIPMENTS	3788	634	4422
CONTRACTOR A	\$TBD	\$TBD	\$TBD
CONTRACTOR B	\$TBD	\$TBD	\$TBD
CONTRACTOR C	\$TBD	\$TBD	\$TBD
CONTRACTOR D	\$TBD	\$TBD	\$TBD
TOTAL CONTRACTS	\$17,424,800	\$2,916,400	\$20,341,200

The transportation contract values will sum up to a total of \$20,341,200. This value is based on a total of 4,422 shipments at an assumed average rate of \$4,600/shipment.

The contractors will invoice on a monthly basis for completed shipments. The resources will be apportioned based on the percentage of shipments completed.

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5) Task #5 - DOE Waste Disposal

The following Table 1-5-99 summarizes the types and quantities of waste generated during the Silos 1 and 2 Project that will be disposed of at an off-site disposal facility. DOE will need to fund the disposal of this waste in the respective fiscal years. Similarly, Table 1-5-100 summarizes the types and quantities of waste generated during the Silos 1 and 2 Project that will be disposed of in the FEMP On-site Disposal Facility. Additional information on these wastestreams can be found in the referenced sections of this closure plan.

TABLE 1-5-99
SILOS 1 AND 2 PROJECT - OFF-SITE DISPOSAL AT THE NTS

ITEM NO.	REF.	WASTE TYPE	DESCRIPTION	EXTERNAL VOLUME (FT ³)	DISPOSAL COST (\$) (\$7.50/ft ³)	SCHEDULE	
						START	END
Operations							
1	1.5.10	Solid	Treated Silos 1 and 2 material (7425 containers)	1,559,250	\$11,694,375	11May06	06Aug07
2	1.5.10	Solid	Treated Silos 1 and 2 material (75 offspec containers)	17,625	\$132,190	11May06	06Aug07
3	1.5.10	Solid	Secondary waste (filters, spent parts, 12 white metal boxes)	1,344	\$10,080	11May06	06Aug07
Safe Shutdown							
4	1.5.11	Solid	Treated holdup material (1 container)	210	\$1,575	11May07	30Oct07
5	1.5.11	Solid	RCS Carbon	15,120	\$113,400	07Aug07	30Oct07
5a	1.5.11	Solid	RTS Carbon	1,904	\$14,280	07Aug07	30Oct07
D&D							
6	1.5.12	Solid	Silo 1	38,080	\$285,600	18Aug06	06Jul07
7	1.5.12	Solid	Silo 2	38,080	\$285,600	18Aug06	06Jul07
8	1.5.12	Solid	Decant Sump Tank System	22,400	\$168,000	18Aug06	06Jul07
9	1.5.12	Solid	Silo 3 Remediation Facility (5 boxes)	560	\$4,200	18Aug06	06Jul07
10	1.5.12	Solid	Silos 1 and 2 Remediation Facilities (10% total)	28,560	\$214,200	07Aug07	28Feb08
11	1.5.12	Solid	RCS and TTA Facilities (10% Total)	140,000	\$1,050,000	07Aug08	28Feb08
TOTAL COST					\$13,959,220		

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TABLE 1.5-100
SILOS 1 AND 2 PROJECT - WASTE DISPOSAL SUMMARY - OSDF

ITEM NO.	REF. SECTION	DESCRIPTION	ROLLOFF BOXES (30yd ³ ea)	SCHEDULE	
				START	END
CONSTRUCTION					
1	1.5.8	Contaminated Soils Generated during Excavations of Remediation Facilities	100 yd ³ (Dump Truck)	17 May 04	11 Apr 05
OPERATIONS					
2	1.5.10	Secondary Waste (Miscellaneous debris, PPE, spent consumables)	1	11 May 06	06 Aug 07
SAFE SHUTDOWN					
3	1.5.12	Secondary Waste (Miscellaneous debris, PPE, spent consumables)	1	11 May 07	30 Oct 07
D&D					
4	1.5.13	Silo 3 Structure Debris	35	18 Aug 06	06 Jul 07
5	1.5.13	Silo 4 Structure Debris	35	18 Aug 06	06 Jul 07
6	1.5.13	Silo 4 Superstructure Debris	30	18 Aug 06	06 Jul 07
7	1.5.13	Silo 3 Remediation Facility	79	18 Aug 06	06 Jul 07
8	1.5.13	RTS and K-65 Trench (N/S)	8	18 Aug 06	06 Jul 07
9	1.5.13	RCS and LTA Facilities	111	07 Aug 07	28 Feb 08
10	1.5.13	Concrete Blocks	15	07 Aug 07	28 Feb 08
11	1.5.13	Silos 1 and 2 Remediation Facility and Support Facilities	412	07 Aug 07	28 Feb 08

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1.5.12 HS1AN - Facility Shutdown

Fluor Fernald will perform safe shutdown activities to place the Silos 1 and 2 remediation and support facilities in a controlled state ready for dismantlement. Fluor Fernald will perform safe shutdown activities in accordance with the FEMP Collective Bargaining Agreement with the FAT&LC. FAT&LC personnel will be used to isolate all utilities to the facilities, remove gross quantities of hold-up from existing equipment, ductwork, pipes, and sumps, and perform gross decontamination to prepare for dismantlement.

The scope, schedule, and resources for the Silos 1 and 2 Facility Shutdown effort will be managed by the following two (2) activities:

- Facility Shutdown Work Plan; and
- Facility Shutdown.

The schedule for all the facility shutdown activities is summarized under the Activity Hammock No. 100030, entitled "Safe Shutdown Oversight and Management." The following sections describe the scope, schedule, and resources for these key activities.

1) Task #1 - Facility Shutdown Work Plan

1.1) Plan/Scope - Facility Shutdown Work Plan

The Silos 1 and 2 Site Engineering team will prepare a Facility Shutdown Work Plan (FSWP), which will guide the facility shutdown activities. The preparation, review, and approval of this work plan will be tracked by the Activity Hammock No. 113898, entitled "Facility Shutdown Work Plan." The total duration of this activity is 180 days. **Table 1.5-101** summarizes the schedule for the FSWP. Completion of the FSWP is a prerequisite for performing safe shutdown activities.

**TABLE 1.5-101
 FACILITY SHUTDOWN WORK PLAN SCHEDULE**

ACTIVITY NO	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113898	FSWP (Hammock)	180	-
113950	Fluor Fernald Prepare Draft FSWP	80	33%
113955	Fluor Fernald Review Draft FSWP	20	50%
113960	Fluor Fernald Revise Draft FSWP	40	56%
113965	DOE-FEMP Review Draft FSWP	10	70%
113970	Fluor Fernald Revise FSWP	20	85%
113975	DOE-FEMP Approve FSWP	10	100%

1.2) Quantification - Facility Shutdown Work Plan

The FSWP will be prepared by the Fluor Fernald Silos 1 and 2 Site Engineering team members, and peer reviewed internally by selected Duratek Services and Fluor Fernald personnel. Fluor Fernald team members will address comments resulting from the peer review and DOE review cycles and revise the document accordingly. These resources are planned under Project Management (Charge No. HS1AA). The ODC resources for developing the FSWP are summarized in Table 1.5-102.

**TABLE 1.5-102
 SUMMARY OF RESOURCES FOR THE FACILITY SHUTDOWN WORK PLAN**

RESOURCE CODE	ACTIVITY NO. 113898 TOTAL RESOURCES
ODCs	
FEDEX	\$200

2) Task #2 - Facility Shutdown

2.1) Plan/Scope - Facility Shutdown

The facilities requiring shutdown for the Silos 1 and 2 Project include the Silos 1, 2, 3, and 4 structures, TTA, RCS, Maintenance Shop, trailers supporting the Silos Project, and the new facilities constructed to support the treatment and disposal of the Silos 1 and 2 material. The Facility Shutdown activities will include the following activities.

Isolation of Utilities (EIP)

Fluor Fernald will isolate all utilities including, but not limited to, electric power, steam, water, and compressed air from the facilities. Fluor Fernald will develop an EIP within the Facility Shutdown Plan that describes when, where, and how, the utilities will be isolated.

Utilities will be safely disconnected outside the facility early in the facility shutdown process, by physically cutting, air gapping, and tagging the lines. Fluor Fernald will remove all grounding conductors to grade level. Fluor Fernald will verify that all utilities are capped and/or controlled and notify the Assistant Emergency Duty Officer of the completion of utilities isolation.

Establish Temporary Utilities

Fluor Fernald will be responsible for the following:

- Extend the power from the point source location or provide portable generators;
- All electrical appurtenances required for temporary power shall be in accordance with the National Electrical Code;
- Temporary heating or cooling, if needed, will be provided. All portable heaters will be Underwriters Laboratory listed or American Gas Association certified for their intended use and not modified for other applications. Ventilation for fuel-fired heaters and adequate clearance to combustible materials, surfaces, and furnishings shall be provided according to manufacturer's recommendations. Use of Liquid Propane gas-fired heaters will be approved by the FEMP Fire Protection group. All portable continuous running of gas-fired heating systems require 24-hour coverage by the project.; and
- Extend the water from the point source location to support operations.

Removal of Hold-Up Material

The interior of all equipment, piping, ductwork, tanks, and sumps will be assessed to determine whether they contain loose and/or visible hold-up material. Loose is defined as material that is considered releasable through a credible accident. If the item contains loose or visible material, the material shall be removed in accordance with FEMP approved Safe Work Plans and properly treated and packaged for disposal.

Gross Decontamination

Fluor Fernald will perform gross decontamination of the remaining equipment and the interior of the treatment facility. Gross decontamination is defined as general housekeeping to remove contaminated debris, vacuum loose dust, wet wipe equipment, ductwork, piping, and the interior of the structure walls, and remove loose, visible residues.

Treatment of Hold-Up Material

It is assumed that the removal of hold-up material will be logically planned so that the material can be flushed and processed forward or manually transferred into a final batch in the mixer before the equipment is disconnected.

Facility Shutdown

The Facility Shutdown activities will be divided into two (2) phases. Phase I activities will include:

- Hold-up material from all equipment, piping, ductwork, tanks, and sumps, including the TTA systems will be removed and treated, as required, to meet the NTS WAC.

- Fluor Fernald will remove contamination on equipment, materials or debris using methods that minimize the generation of secondary waste.
- All process equipment and support systems will be flushed to remove loose contaminants and process residues. Equipment and systems will then be drained and dried in preparation for dismantlement. Wastewater will be collected, staged, sampled, and treated, as necessary to meet the discharge requirements of AWWT facility prior to discharge to the AWWT. Sampling and analysis activities will be performed on wastewater to verify compliance with the AWWT discharge requirements.
- The RCS will be isolated for a period up to 45 calendar days to allow sufficient time for the natural decay of the radon remaining in the carbon beds. Because of fine particulate present in the carbon beds, the 160,000 pounds of carbon in the carbon beds will be pneumatically transferred into 55-gallon drums and packaged into a six-pack overpack container for disposal at the NTS. Assuming a density of 30 lbs/ft³, it will take 800 drums and 135 six-pack overpack containers to package the spent carbon beds for disposal at the NTS.

Phase II activities will focus upon:

- Isolation of all utilities supporting all the remediation and support equipment, systems, etc.;
- Establish temporary utilities to support dismantlement;
- Excessing of all trailers, furniture, etc.; and
- Remove carbon from the RCS and RTS.

The facility shutdown activities will begin immediately following the completion of Operations (Activity No. 101000) and the completion of the FSWP (Activity No. 113898).

The Facility Shutdown Activity Hammock No. 113909 will be 120 days in duration, Phase I is planned for 60 days and Phase II is planned for 60 days. Table 1.5-103 summarizes the Facility Shutdown Schedule.

**TABLE 1.5-103
 SUMMARY SCHEDULE FOR THE FACILITIES SHUTDOWN**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113909	Facility Shutdown	120	-
113904	Facility Shutdown – Phase I	60	50%
113905	Facility Shutdown – Phase II	60	100%

2.2) Quantification - Facility Shutdown

R1-
F07-
026

Table 1.5-104 104A and B summarizes the resources for completing the Facility Shutdown Activities for the Silos 1 and 2 Project. The labor resources will be managed and reported under HS1AN. No overtime is planned during safe shutdown activities.

R1-
 F07-
 026

TABLE 1.5-104A

RESOURCE SUMMARY FOR FACILITY SHUTDOWN

Resource Code	SAFE SHUTDOWN - ACTIVITY NO. 113909					
	TOTAL RESOURCES					
	MAY	JUN	JUL	AUG	SEP	OCT
LABOR (FTEs)						
CHMOPR	20	20	20	8	8	8
CRPNTR	2	2	2	1	1	1
ELECTN	6	6	6	2	2	2
ENGPRC	2	2	2	2	2	2
ENSTEC	1	1	1	1	1	1
HEOOPR	4	4	4	2	2	2
INSMEC	6	6	6	2	2	2
LABCHM	1	1	1	1	1	1
MILWRT	6	6	6	2	2	2
MNTMGR	1	1	1	0.5	0.5	0.5
MNTREP	1	1	1	1	1	1
MVOOPR	2	2	2	2	2	2
OPRMGR	1	1	1	1	1	1
OPRMGR	6	6	6	3	3	3
PIPETR	6	6	6	2	2	2

R1-
 F07-
 026

Resource Code	SAFE SHUTDOWN - ACTIVITY NO. 113909					
	TOTAL RESOURCES					
	MAY	JUN	JUL	AUG	SEP	OCT
PJSREP	1	1	1	0.5	0.5	0.5
RADENG	1	1	1	1	1	1
RADMGR	1	1	1	1	1	1
RADTEC	12	12	12	4	4	4
RIGGER	1	1	1	0.5	0.5	0.5
S&HENG	1	1	1	1	1	1
S&HENG	1	1	1	0.5	0.5	0.5
TRNLAB	2	2	2	2	2	2
WSTENG	1	1	1	1	1	1
WSTMGR	0.5	0.5	0.5	0.5	0.5	0.5

TABLE 1.5-104B 1.5-101
FACILITY SHUTDOWN ODCS RESOURCE SUMMARY

R1-
F07-
026

R1-
D-
766

R1-
D-
723

R1-
F07-
042

RESOURCE CODE	TOTAL RESOURCES
LABOR (FTEs)	
OPRMGR	8
CHEMOPR	14
ENGPRC	6
RADTEC	11.5
HEOOPR	2
INHTEC	2
S&HTEC	2
MNTMGR	4
ELECTN	6
MILWRT	6
PIPFTR	6
INSMEC	6
DEPADM	1
CLERKS	1
RADENG	1.5
INDHYG	1
MNTREP	2
PJSREP	1
S&HTEC	1
SUBTOTAL LABOR	69
	82
ODCs	
WHITE METAL BOXES	\$162,000 \$182,400
DRUMS	\$32,000 \$36,000
FULL ANTI-C'S	\$2,523 \$2,916
NORMAL PPE	\$1,291 \$1,454
VEHICLES (MOVES)	\$4,067
VEHICLES (LOADING)	\$1,931
ABSORBENT	\$16,200 \$18,240
OTHER MATERIALS	\$32,400 \$36,480

R1-
 D-
 723

R1-
 F07-
 049

SHORING	\$2,700 \$3,100
SALES TAX (6%)	\$14,947 \$16,835
WAC LAB ANALYSIS	\$16,750 \$25,125
OSHA Compliance Lab Analysis	\$10,250
VEHICLES (MOVES)	\$4,067 \$4,576
VEHICLES (LOADING)	\$1,931 \$2,174
SUBTOTAL ODCs	\$286,809 \$339,550

1.5.13 HS1AP - Decontamination and Dismantlement (D&D) Support

Consistent with the Silos 1 and 2 Project Contracting Strategy, the Silos 1 and 2 Site Engineering Team will develop a performance specification to procure the services of a qualified contractor to perform the D&D of the OU4 structures and remediation facilities under the terms and conditions of a Fixed-Price Contract. These facilities include the Silos Maintenance Shop, (formerly the Vitrification Pilot Plant) the abandoned RTS, the new RCS, the TTA, the Silos support trailers, Silos 1, 2, 3, and 4, and the Silo 3 remediation facility. The scope, schedule, and resources for the D&D activities will be managed by the following four (4) key activities:

- D&D Implementation Plan;
- Develop D&D RFP;
- Bid and Award D&D Package; and
- D&D Contract Management and Support.

The schedule for the D&D activities is summarized under the Activity Hammock No. 100028. The D&D Support resources will be managed and reported under charge number HS1AP. The following sections describe the scope, schedule, and planned resources for these key activities.

1) Task #1 – D&D Implementation Plan

1.1) Plan/Scope - D&D Implementation Plan

The Silos 1 and 2 Site Engineering team will be responsible for the preparation of the D&D Implementation Plan. The purpose of the D&D Implementation Plan is to summarize Silos 1 and 2 Remediation Facilities in a manner consistent with the format and content approved by the EPA and OEPA, through the approval of the OU3 Integrated RD/RA work plan and previous above-grade D&D implementation plans. The Implementation Plan will elaborate, as applicable, on programmatic strategies developed by OU3, above-grade D&D strategies developed for the contractor's scope of work, project plans, and specifications.

The Silos 1 and 2 Site Engineering team will submit the Implementation Plan to the DOE, EPA, and OEPA for review and approval. Upon approval, the Implementation will become part of the IFB Package for the D&D activities.

Following construction of the Silos 1 and 2 remediation and support facilities, the Silos 1 and 2 Site Engineering team will prepare the draft Silos 1 and 2 D&D Implementation Plan. This regulatory submittal must be reviewed by DOE-FEMP, prior to its submittal to the EPA. It is assumed that DOE will take a total of twenty (20) days to review the draft document and closeout all comments with Fluor Fernald. In accordance with the Amended Consent Agreement, it is assumed that EPA and OEPA will require sixty (60) calendar days to both review and approve the draft and revised Implementation Plan. The following **Table 1.5-105**, summarizes the planned activities and milestones for reporting progress on this effort.

**TABLE 1.5-105
 D&D IMPLEMENTATION PLAN SCHEDULE**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
101100	D&D Implementation Plan (Hammock)	220	-
113850	Prepare D&D Implementation Plan	40	25%
116028	Present D&D Implementation Plan to ISRC	1	-
113854	Fluor Fernald/ISRC Review D&D Implementation Plan	20	-
113858	Finalize D&D Implementation Plan	10	33%
116032	DOE Review D&D Implementation Plan	20	-
116036	Finalize D&D Implementation Plan	10	-
113862	Fluor Fernald/DOE Review/Accept D&D Implementation Plan	4	50%
113866	EPA and OEPA Review D&D Implementation Plan	40	65%
113870	Fluor Fernald/DOE Resolve EPA/OEPA Comments	5	-
113874	Develop Response to Comments/Finalize D&D Implementation Plan	10	80%
113878	Submit to EPA/OEPA – D&D Implementation Plan	5	-
113882	EPA & OEPA Review/Approve – D&D Implementation Plan	40	-
113886	Submit Final D&D Implementation Plan – DOE	10	90%
113890	Submit Final D&D Implementation Plan – EPA/OEPA	5	100%

1.2) Quantification - D&D Implementation Plan

The Silos 1 and 2 D&D Implementation Plan will be prepared by Fluor Fernald Silos 1 and 2 Site Engineering team members and peer reviewed by selected Duratek and Fluor Fernald personnel. The Silos 1 and 2 Site Engineering team members will address comments resulting from the peer review, DOE review, and EPA/OEPA review cycles and revise the document accordingly. The resources for developing the D&D Implementation Plan are summarized in **Table 1.5-106**.

**TABLE 1.5-106
 D&D IMPLEMENTATION PLAN RESOURCE SUMMARY**

R1-
 F07-
 026

RESOURCE CODE	TOTAL RESOURCES
Labor (FTEs)	
RADENG	0.46
RADMGR	0.73
S&HENG	0.18
MVOOPR	0.73
WSTENG	0.73
WSTMGR	0.46
ODCs	
FEDEX	\$300
TOTAL	\$300

R1-
 F07-
 026

TABLE 1.5-106

D&D IMPLEMENTATION PLAN - RESOURCE SUMMARY

Resource Code	D&D IMPLEMENTATION PLAN - ACTIVITY NO. 101100									
	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
LABOR (FTEs)										
WSTENG								1.0	1.0	0.5
WSTMGR		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25
ODCs (\$)										
FED EX				100		100		100		

2) Task #2 - Prepare D&D RFP

2.1) Plan/Scope - Prepare D&D RFP

Consistent with the Silos 1 and 2 Contracting Strategy, the Silos 1 and 2 Site Engineering team will prepare a performance specification to secure the services of a qualified contractor under the terms and conditions of a Fixed-Price Contract for the D&D of the Silos 1 and 2 remediation and support facilities. The performance specification will be consistent with the EPA-approved Silos 1 and 2 D&D Implementation Plan.

The Silos 1 and 2 Site Engineering team in consultation with the Facilities D&D group and Waste Generator Services will prepare the technical scope for the RFP. The RFP will be prepared consistent with the nine part model contract pursuant to FEMP Procedure No. CT-2.1.1, Rev. 11.

The preparation of the Silos 1 and 2 D&D RFP will begin shortly after the Silos 1 and 2 D&D Implementation Plan has been issued to the EPA/OEPA for review and comment. The preparation of the Silos 1 and 2 D&D RFP will take 115 workdays and it is represented by Activity Hammock No. 113825, "Prepare D&D RFP." **Table 1.5-107** provides a schedule summary of the D&D RFP preparation activities and the milestones for reporting progress and apportioning D&D Support resources.

**TABLE 1.5-107
 SCHEDULE SUMMARY FOR THE PREPARATION OF THE D&D RFP**

ACTIVITY NO	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113825	Develop D&D RFP (HAMMOCK)	115	-
114100	Prepare D&D RFP	40	40%
114102	Review D&D RFP	20	50%
114104	Revise D&D RFP	10	70%
114106	CRB Review D&D RFP	5	-
114108	Incorporate CRB Comments	10	80%
114110	DOE Review D&D RFP	20	90%
114112	Revise and Issue D&D RFP to Vendors	10	100%

2.2) Quantification - Prepare D&D RFP

Table 1.5-108 provides a resource summary of the planned resources for the preparation of the Silos 1 and 2 D&D RFP. The planned resources includes providing DOE-FEMP a draft copy of the RFP for review in parallel to Fluor Fernald review of the draft RFP.

**TABLE 1.5-108
 RESOURCE SUMMARY — PREPARATION OF THE D&D RFP**

R1-
 F07-
 026

RESOURCE CODE	TOTAL RESOURCES
LABOR (FTEs)	
ENSRTEG	0.5
RADENG	2.0
RADTEG	0.5
MVOOPR	2
WSTENG	2
WSTMGR	0.5
ODGs	
FEDEX	\$200

R1-
 F07-
 026

TABLE 1.5-108

RESOURCE SUMMARY - PREPARATION OF D&D RFP

Resource	PREPARATION OF D&D RFP - ACTIVITY NO. 113825					
Codes	MAR	APR	MAY	JUN	JUL	AUG
LABOR (FTEs)						
MVOOPR	-	1	1	1	1	2
RADENG	-	0.5	0.5	0.5	1	1
RADMGR	-	-	-	-	-	1
RADTEC	-	1	1	1	-	2
WSTENG	0.5	1	1	1	1	1
WSTMGR	0.25	0.5	0.5	0.5	0.5	0.5
ODCs \$						
FED EX	-	-	100	-	100	-

3) Task #3 - Bid and Award D&D Contract

3.1) Plan/Scope - Bid and Award D&D Contract

The RFP for the Silos 1 and 2 D&D activities will be released to vendors for a period of 40 days. A SEB will be convened to evaluate the technical and cost proposals. Vendors will be given an opportunity to submit BAFOs prior to completing vendor selections. The Silos 1 and 2 Site Engineering team will prepare a consent package for DOE review and approval prior to awarding the contract.

The bid and award of the Silos 1 and 2 D&D RFP will take 110 work days and is represented by Activity Hammock No. 113827, "Bid and Award D&D RFP." Table 1.5-109 provides a schedule summary of the D&D RFP Bid and Award activities and the milestones for reporting progress and apportioning D&D support resources.

**TABLE 1.5-109
 SCHEDULE SUMMARY FOR THE BID AND AWARD D&D RFP**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
113827	Bid and Award D&D RFP (HAMMOCK)	126	-
114200	Vendors Prepare & Submit Proposal	40	33%
114205	Assemble SEB	20	45%
114210	Prebid Conference with Vendors	1	-
114215	SEB Evaluate Proposals	15	60%
114220	Vendors Prepare and submit BAFOs	10	-
114225	SEB Completes Evaluations	5	75%
114230	Prepare Consent Package	10	80%
114235	CRB Review Consent Package	5	-
114240	Incorporate CRB Comments	5	90%
114245	DOE-FEMP Review Consent Package	20	95%
114250	Fluor Fernald Revise Consent Package	10	-
114255	Fluor Fernald Awards D&D Contract	1	100%

3.2) Quantification - Bid and Award D&D Contract

Table 1.5-110 provides a resource summary of the planned resources for the bid and award of the Silos 1 and 2 D&D RFP. The Fluor Fernald labor resources are planned under Project Management (Charge No. HS1AA).

R1-
 F07-
 026

TABLE 1.5-110
RESOURCE SUMMARY — BID AND AWARD D&D RFP

RESOURCE CODE	TOTAL RESOURCES
LABOR (FTEs)	
CNSCOD	3
CNSENG	3
RADENG	0.5
RADTEC	6
RADMGR	0.5
S&HENG	1
S&HTEC	1
MVOOPR	2
WSTENG	2
WSTMGR	0.5
ODGs	
FEDEX	\$200

R1-
 F07-
 026

TABLE 1.5-110

RESOURCE SUMMARY — BID AND AWARD D&D RFP

Resource Code	BID AND AWARD D&D PACKAGE — ACTIVITY NO. 113827					
	SEP	OCT	NOV	DEC	JAN	FEB
LABOR (FTEs)						
CNSCOD	-	1	1	1	1	1
CNSENG	-	1	1	1	1	1
CNSENG	-	1	1	1	1	1
CNSENG	-	1	1	1	1	1
CNSENG	-	1	1	1	1	1
CNSENG	-	1	1	1	1	1

Resource	BID AND AWARD D&D PACKAGE - ACTIVITY NO. 113827					
Code	SEP	OCT	NOV	DEC	JAN	FEB
MVOOPR	2	2	2	2	2	2
QACENG	-	1	1	1	1	1
QACTEC	-	1	1	1	1	1
RADENG	1	1	1	1	1	1
RADMGR	0.5	0.5	0.5	0.5	0.5	0.5
RADTEC	2	2	2	2	2	2
S&HENG	-	1	1	1	1	1
S&HTEC	-	1	1	1	1	1
WSTENG	-	1	1	1	1	1
WSTENG	1	1	1	1	1	1
WSTMGR	0.5	0.5	0.5	0.5	0.5	0.5
ODCs \$						
FED EX	-	100	-	100	-	100

R1-
F07-
026

4) Task #4 - D&D Subcontract Management and Support

4.1) Plan/Scope - D&D Subcontract Management and Support

During D&D, Fluor Fernald will perform daily oversight of the subcontractor to ensure that the requirements of the contract are being followed in the field, including safety performance, compliance with the EPA-approved D&D Implementation Plan, and verification of D&D activities per the subcontractor's work plan. Subcontract management also involves providing permits in accordance with the planned work and tracking the subcontractor's schedule. Subcontract management also includes:

- Submittal(s) review and approval;
- Safety Meetings;
- Permits;
- Mobilization;
- Inspecting Secondary Containment;
- Contract Modifications;
- Quality Assurance (surveillance(s) and assessment(s); and
- Progress Reporting (cost and schedule).

During D&D field activities, Fluor Fernald will provide waste handling and disposition support to the Contractor. Fluor Fernald will be responsible for the final disposition of the D&D debris and secondary waste. D&D support includes:

- Providing containers and roll-off boxes for waste packaging;
- Certification of waste for disposal at the NTS;
- Certification of waste for disposal in the OSDf; and
- Arrangements for off-site/on-site transportation.

The overall period of performance for the D&D of the Silos 1 and 2 remediation and support facilities is 220 workdays and is broken down as follows:

<u>Task</u>	<u>Duration</u>
D&D Deliverables	80 workdays
Mobilization (occurs in parallel to D&D Deliverables)	
D&D Actions	140 workdays

The subcontractor will submit a project schedule, pay item schedule, and earned value schedule, which will be incorporated into the project baseline and used as a basis for reporting progress and apportioning earned value for D&D management labor.

4.2) Quantification - D&D Subcontract Management and Support

Tables 1.5-111 A and B summarizes the labor resources to support the D&D Contractor's field activities, which are planned under Charge No. HS1AP. Earned value will be apportioned based upon the Contractor's performance in the field.

TABLE 1.5-111A

RESOURCE SUMMARY FOR THE D&D CONTRACT MANAGEMENT

ACTIVITY NO. 100028

R1-
 F07-
 026

Resource Code	FY-06				FY-07				FY-08		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
CNSCOD	-	1	1	1	1	1	1	1	1	1	1
CNSENG	-	1	1	1	1	1	1	1	1	1	1
CNSENG	-	1	1	1	1	1	1	1	1	1	1
CNSENG	-	1	1	1	1	1	1	1	1	1	1
CNSENG	-	1	1	1	1	1	1	1	1	1	1
CNSENG	-	1	1	1	1	1	1	1	1	1	1
ENSTEC	-	-	-	-	-	-	-	-	-	1	-
HAZWAT	-	-	4	8	8	8	8	8	8	-	-
HEOOPR	-	-	4	5	5	5	5	5	5	3	3
LABCHM	-	-	-	-	-	-	-	-	-	1	-
MVOOPR	-	2	2	4	4	4	4	4	4	4	2
QACENG	-	1	1	1	1	1	1	1	1	1	1
QACTEC	-	3	6	6	6	6	6	6	6	6	6
RADENG	-	1	1	1	1	1	1	1	1	1	1

R1-
 F07-
 026

Resource Code	FY-06				FY-07				FY-08		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
RADMGR	-	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1
RADTEC	-	5	8	8	8	8	8	8	8	8	8
S&HENG	-	1	1	1	1	1	1	1	1	1	1
S&HTEC	-	1	1	1	1	1	1	1	1	1	1
TRNLAB	-	6	12	12	12	12	12	12	12	10	8
WSTENG	-	1	1	1	1	1	1	1	1	1	-
WSTENG	-	1	1	1	1	1	1	1	1	1	1
WSTMGR	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1

R1-
 F07-
 026

TABLE 1.5-111B
RESOURCE SUMMARY FOR D&D CONTRACT MANAGEMENT

RESOURCE CODE		D&D CONTRACT MANAGEMENT TOTAL RESOURCES (FTEs)
LABOR (FTEs)		
	CNSCOD	3
	CNSENG	3
	ENSRTEC	0.04
	RADENG	0.5
	RADTEC	8
	RADMGR	0.5
	S&HENG	1
	S&HTEC	1
	HAZWAT	7
	LABCHEM	0.04
	QACENG	1
	QACTEC	5.5
	HEOOPR	4
	MVOOPR	3.5
	TRNLAB	10
	WSTENG	2
	WSTMGR	0.5
	SUBTOTAL FTEs	50.58
	ODCs	
R1- F07- 43	WHITE METAL BOXES (2390)	\$2,868,000
	Full Anti-Cs	\$1,144
	Normal PPE	\$22,851
	Absorbent	\$286,800
R1- F07- 058	Other Materials	\$573,600
	Shoring	\$59,900
	SALES TAX (6%)	\$228,738
	WAC Lab Analysis	\$92,125
	OSHA Compliance Lab Analyses	\$47,250
R1- F07- 049	Vehicles (Moves)	\$21,362
	Vehicles (Loading)	\$34,178
	SUBTOTAL ODCs	\$4,138,698
		\$4,235,948

1.5.14 HS1AR - D&D Contract

1) Plan/Scope - D&D Contract

Consistent with the Silos 1 and 2 Project Contracting Strategy (**Section 1.2.1**), the Silos 1 and 2 Site Engineering team will develop a performance-based specification to procure the services of a qualified contractor to perform the D&D of the Operable Unit 4 structures and remediation facilities under the terms and conditions of a Fixed-Price contract. The D&D of the OU4 structures and facilities have been segregated into three phases due to the availability of their components for D&D in different years as follows:

Phase I

- Silo 3;
- Silo 4;
- Silo 4 Superstructure;
- Silo 3 Treatment Facilities; and
- RTS.

Phase II

- Silo 1;
- Silo 2;
- Silos 1 and 2 Superstructure;
- Decant Sump Tank System; and
- K-65 Trench.

Phase III

- TTA;
- RCS;
- Silos 1 and 2 Treatment Facilities;
- Maintenance Shop (former Vitrification Pilot Plant); and
- OU4 Support Trailers.

Facility Descriptions

The following **Tables 1.5-112** through **1.5-114** provide a brief description of the components of each D&D Phase.

**TABLE 1.5-112
 D&D PHASE I – FACILITY DESCRIPTION**

FACILITY OR STRUCTURE	DESCRIPTION
Silo 3	<p>Known as FEMP Site Structure 35B, the Southern Metal Oxide Storage Tank (Silo 3) is a cylindrical concrete storage tank having the approximate dimensions of 80-foot inside diameter, 27-foot height at the top of the wall, and 36-foot height to the top of the dome at the center of the silo. The silo walls were cast in place with an 8-inch thickness using 4,500 psi concrete. The silo is wrapped on the outside with prestressed steel wires and covered with 1-inch thick gunite. The wall reinforcement was primarily provided by vertical preload units spaced 4-feet apart around the circumference. The wall was tied to the floor and dome with reinforcement steel. The dome was also cast using 4,500 psi concrete, 8-inches thick near the edge, tapering to 4-inches thick at the center. Dome reinforcement consisted primarily of welded wire mesh. The floor of the silo is constructed of reinforced concrete 4-inches thick.</p> <p>Once the contents of Silo 3 have been removed, the interior will be cleaned to meet visual inspection requirements and "lock-down" will be applied to seal any loose residual contamination. The silo will be readied for demolition by the Silo 3 Project.</p> <p>A similar demolition approach will be used for all four of the silos. The concrete dome and upper portions of the side walls will be collapsed into the concrete silo using a wrecking ball. A concrete shear will be used to complete the wall demolition and sizing of the concrete to meet OSDF Category 2 size criteria using a hydraulic shear. During all stages of structural dismantlement, a water spray will be used to wet the concrete and suppress airborne emissions. The contractor will containerize the structural steel and concrete together in roll-off boxes and will move the containers to the queue area for disposition in the OSDF.</p>
Silo 4 and Silo 4 Superstructure	<p>Known as FEMP Site Structure 34A, the Northern Metal Oxide Storage Tank (Silo 4). It is identical to Silo 3 with two exceptions. First it was never used as a storage tank and is therefore considered radiologically "clean". Second, a steel superstructure was built over the top of Silo 4 to be used for practice in simulating waste retrieval techniques and other work on Silos 1 and 2. Therefore, the demolition approach will be the same as Silo 3, except that only Level D PPE will be required during D&D activities and the superstructure will be dismantled before the concrete silo by tripping the superstructure to the northeast and size reducing the steel using a hydraulic shear.</p>

**TABLE 1.5-112
 D&D PHASE I – FACILITY DESCRIPTION (CONT'D)**

FACILITY OR STRUCTURE	DESCRIPTION
<p>Radon Treatment System</p>	<p>Known as FEMP Site Structure 34C, the RTS is a pre-engineered aluminum clad building approximately 70 square feet. The block wall surrounding the frame of the building is 32-inches thick. Building 34C contains 2 calcium drier (dessicant) canisters, 8 activated carbon (charcoal) adsorption canisters, and 2 fan units, all connected with PVC piping.</p> <p>It is assumed the contents of the dessicant canisters and carbon beds will be removed prior to D&D. The interior equipment and piping will be removed and sized first, washed using a high-pressure, low-volume water spray, and visually inspected to ensure the equipment and piping meets the OSDF WAC.</p> <p>The exterior concrete block walls will then be dismantled using a concrete shear while administering water spray to suppress dust.</p> <p>Release cleaning of the metal structure will be performed by; 1) HEPA vacuuming and/or wet wipe any loose contamination or residuals; 2) using high pressure, low volume water washing; and 3) applying fixitive to areas which do not meet the release cleaning criteria. The structure will then be dismantled and sized using a hydraulic shear.</p> <p>The PVC piping, concrete block, and metal will be segregated and containerized in separate roll-off boxes and moved to the queue area for transportation to the OSDF.</p>
<p>Silo 3 Remediation Facility</p>	<p>A detailed description of the Silo 3 Remediation Facilities is provided in Section 1.5 of the Silo 3 Closure Plan. The following is a brief description of the facilities. The Silo 3 remediation activities will be housed in two (2) temporary pre-engineered, fabric containment structures. A 40' (L) X 25' (W) containment enclosure will be constructed abutting Silo 3. Its 9 inch-thick steel reinforced concrete floor will be sloped below grade to facilitate access to the silo floor. This containment structure will house the bulk retrieval equipment. A second enclosure, 100' (L) x 60' (W) will be constructed adjoining the containment enclosure to house the treatment system. The treatment system consists of a Silo 3 material receiving hopper, additive bins, conveying systems, hatch mixer, waste packaging and loading equipment.</p> <p>The equipment and containment structures will be sized reduced with mechanical shears and placed into 79 roll-off boxes. The boxes will be taken to a queue area by the D&D Contractor for placement into the OSDF. Its assumed that a portion of equipment will not meet the OSDF WAC and require disposal at the NTS. This equipment will be size-reduced and placed into five (5) containers and taken to the queue area for disposal at the NTS.</p>

**TABLE 1.5-113
 D&D PHASE II – FACILITY DESCRIPTIONS**

FACILITY OR STRUCTURE	DESCRIPTION
Silo 1 and Silo 2	<p>Known as FEMP Site Structures 34B and 34A, Silos 1 and 2 respectively, are cylindrical concrete storage tanks, each having the approximate dimensions of 80-foot inside diameter, 27-foot height at the top of the wall, and 36-foot height to the top of the dome at the center of the silo. The silo walls were cast in place with an 8-inch thickness using 4,500 psi concrete. The silo is wrapped on the outside with prestressed steel wires and covered with 1-inch thick gunite. The wall reinforcement was primarily provided by vertical preload units spaced 4-feet apart around the circumference. The wall was tied to the floor and dome with reinforcement steel. The dome was also cast using 4,500 psi concrete, 8-inches thick near the edge, tapering to 4-inches thick at the center. Dome reinforcement consisted primarily of welded wire mesh. The floor of the silo is constructed of reinforced concrete 4-inches thick.</p> <p>In 1986, a 30-foot diameter protective cover constructed of steel and plywood was added to the domes of Silos 1 and 2. In 1987, 3-inches of rigid polyurethane foam topped by a 45-mil membrane was placed on top of each dome.</p> <p>The AWR Project will remove a portion of the protective cover, the PVC piping leading from Silos 1 and 2 to the RTS as well as the above-grade soil berm around the two (2) concrete silos. If the Accelerated Waste Retrieval subcontractor AWR Project adds structural components to the silo to add stability to the concrete structures as the soil berm and silo contents are being removed, those structural components will remain in place to be dismantled by the D&D subcontractor. Once the contents of the silos have been removed, the Accelerated Waste Retrieval subcontractor AWR Project will clean the interior concrete walls to meet visual inspection requirements and will apply lock-down to seal any loose residual contamination. The silos will then be turned over to the D&D project for demolition.</p> <p>The concrete domes and upper portions of the side walls will be collapsed into the concrete silos using a wrecking ball. A concrete shear will be used to complete the wall demolition and sizing of the concrete to be packaged into containers for disposal at NTS. Any structural steel members will also be sized to meet packaging criteria using a hydraulic shear. During all stages of structural dismantlement, a water spray will be used to wet the concrete and suppress airborne emissions. The contractor will containerize the structural steel and concrete together in boxes and will move the containers to the queue area for disposition to the NTS.</p>
Silos 1 and 2 Superstructure	<p>A 120-foot long steel superstructure will be built over the top of Silos 1 and 2 to deploy the waste retrieval systems into each of the Silos. The superstructure will be tripped to the southwest and the structural steel will be size-reduced using a hydraulic shear. It is assumed that the superstructure will be disposed into the OSDF.</p>

R1-
 F07-
 044

**TABLE 1.5-113
 D&D PHASE II – FACILITY DESCRIPTIONS (CONT'D)**

FACILITY OR STRUCTURE	DESCRIPTION
Decant Sump Tank System	<p>Beneath and between Silos 1 and 2 is an underdrain system. The underdrain system consists of a 5 cm (2-inch) slotted pipe in a 20 cm (8-inch) gravel layer. The gravel layer is underlain by a 5 cm (2-inch) thick layer of asphaltic concrete followed by a 43 cm (17-inch) thick layer of compacted clay. The underdrain system is connected to the Decant Sump Tank to collect any potential leakage through the base of Silos 1 and 2. The D&D contractor will remove the underdrain system and the sump (i.e., sludge and sediment) and any exposed piping and pumps. All materials are planned to be packaged in white metal boxes for shipment to NTS. Any sludge and sediment from the K-65 Decant Sump will be removed by the AWR Project.</p>
K-65 Trench	<p>A portion of the K-65 concrete trench and sumps that contained the piping used to transfer waste material to Silos 1, 2 and 3 as well as collect and direct storm water away from the Silos resides within the geographical boundary of OU4. There is 260 linear feet of abandoned trench and sumps. The trench is constructed of 8" thick concrete, #4 rebar on 12-inch centers, having the following nominal dimensions of 5' wide by 7' deep.</p> <p>The piping in the trench was removed prior to placement of the berm in 1964. While no releases within the trench are documented, it is reasonably expected that isolated areas of elevated contamination will exist.</p> <p>It is assumed that all the debris resulting from the removal of the trench will meet the OSDF WAC for debris. It is estimated that 4,160 ft³ of debris will be removed from the trench and sumps. The debris will be removed by backhoe, placed in roll-off boxes and moved to the queue area for transportation to the OSDF.</p>

**TABLE 1.5-114
 D&D PHASE III – FACILITY DESCRIPTIONS**

FACILITY OR STRUCTURE	DESCRIPTION
R1- F07- 045 Silos 1 and 2 Remediation and Support Facilities	See Section 1.4 – Project Physical Description
Transfer Tank Area	<p>The TTA consists of four tanks each with a capacity of 750, 000 gallons. The tanks are 66-feet in diameter, have a straight side dimension of 30-feet, and are provided with ¼-inch corrosion allowance. The tank roofs are dome shaped and are supported by rafters to minimize the overall height to 33-feet, 6-inches from the top of their concrete foundations. The TTA enclosure is a concrete structure that is 152-feet long and 152-feet wide and a floor thickness of 9-inches. An equipment deck covers the storage tanks. The equipment deck is supported by a steel column and beam system.</p> <p>The metal structures will be decontaminated by: 1) HEPA vacuuming and/or wet wipe any loose contamination or residuals; 2) high pressure, low volume water washing; and 3) applying fixative to areas which do not meet the release cleaning criteria. The structure will then be dismantled and sized using a hydraulic shear.</p> <p>The concrete enclosure will be dismantled using a concrete shear while administering water spray to suppress dust.</p> <p>It is assumed that 90% of the volume of waste generated from D&D of the TTA will meet the OSDF WAC and be disposed in the OSDF. The remaining 10% will be packaged in white metal boxes, transported, and disposed at the NTS.</p>
Radon Control System	<p>The RCS consists of four insulated carbon steel vessels approximately 16-feet by 11-feet by 11-feet, which contain a total of 160,000 pounds of carbon (40,000 pounds per vessel). The RCS Air Handling Building has a second-story and a nominal footprint of 30-feet by 135-feet. Outside the building is an exterior pad upon which the set of redundant chillers are located. The RCS building is separated into two areas, one containing the carbon beds and one containing the process equipment for air handling and conditioning. A concrete partition 24-inches thick separates the areas. The first floor contains the roughing filters, dessicant drying systems, condensate hold-up tanks, and condensate transfer pumps. Two 24-inch concrete shielding walls separate the air conditioning process trains. A 12-inch slab is positioned over the dessicant drying system. The carbon bed area is shielded by 24-inches of concrete. The air conditioning areas around the dessicant dryer and roughing filters are shielded by 12-inches of concrete and 3-inches of steel plating. The stack is a 150-foot tapered carbon steel stack that is approximately 6-feet, 4-inches in diameter at the base and tapers to approximately 3-feet at the top.</p> <p>The carbon from the RCS will be placed into 55-gallon drums overpacked in white metal boxes and transported and disposed at the NTS.</p> <p>It is assumed that 90% of D&D waste from the RCS will meet the OSDF WAC and will be disposed in the OSDF. The remaining 10% will be packed in white metal boxes, transported, and disposed at the NTS.</p>

**TABLE 1.5-114
 D&D PHASE III – FACILITY DESCRIPTIONS (CONT'D)**

FACILITY OR STRUCTURE	DESCRIPTION																								
OU4 Support Trailers	<p>The following list of trailers will be dismantled and sized reduced using a hydraulic shear during the OU4 Phase III D&D:</p> <table data-bbox="568 472 1429 1039"> <tr> <td>T-0012</td> <td>K-65 Area Trailer</td> </tr> <tr> <td>T-060</td> <td>DOE Field Office Trailer (8 x 20 ft.)</td> </tr> <tr> <td>T-089</td> <td>Vit Office (14 x 56 ft.)</td> </tr> <tr> <td>T-090</td> <td>Vit Office (14 x 56 ft.)</td> </tr> <tr> <td>T-091</td> <td>Vit Office (14 x 70 ft.)</td> </tr> <tr> <td>T-092</td> <td>Vit Office (14 x 70 ft.)</td> </tr> <tr> <td>T-117</td> <td>Trailer 117 (24 x 66 ft.)</td> </tr> <tr> <td>T-118</td> <td>Trailer 118 (10 x 42 ft.)</td> </tr> <tr> <td>T-119</td> <td>Restroom Trailer (10 x 46 ft.)</td> </tr> <tr> <td>T-120</td> <td>Vit Restroom (14 x 74 ft.)</td> </tr> <tr> <td>T-122</td> <td>Semi-trailer</td> </tr> <tr> <td>T-57</td> <td>Doublewide Trailer for Shipping Operations (24 x 66)</td> </tr> </table> <p>The shredded trailers will be placed into roll-off boxes and moved to the queue area for disposition to the OSDF.</p>	T-0012	K-65 Area Trailer	T-060	DOE Field Office Trailer (8 x 20 ft.)	T-089	Vit Office (14 x 56 ft.)	T-090	Vit Office (14 x 56 ft.)	T-091	Vit Office (14 x 70 ft.)	T-092	Vit Office (14 x 70 ft.)	T-117	Trailer 117 (24 x 66 ft.)	T-118	Trailer 118 (10 x 42 ft.)	T-119	Restroom Trailer (10 x 46 ft.)	T-120	Vit Restroom (14 x 74 ft.)	T-122	Semi-trailer	T-57	Doublewide Trailer for Shipping Operations (24 x 66)
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T-57	Doublewide Trailer for Shipping Operations (24 x 66)																								
Vitrification Pilot Plant	<p>The Vitrification Pilot Plant (VitPP), FEMP Site Structure No. 94A, will be converted to a Maintenance Shop under the scope of the AWR Project. The Maintenance Shop will be a radiological work area for repairs of equipment utilized in the Silos Division Projects. Upon completion of the Silos 1 and 2 Project the Maintenance Shop will undergo D&D with the other support facilities. It is assumed that 90% of the waste associated with D&D of the Maintenance Shop will meet the OSDF WAC and will be disposed in the OSDF. The remaining 10% will be packaged in white metal boxes for transport and disposal at the NTS.</p>																								

The organization of the D&D contract will consist of a base contract and two contract options to address the OU4 D&D scope as follows:

- Base Contract: Phase I;
- Option 1: Phase II; and
- Option 2: Phase III.

The organization of the D&D Contract in this manner, is part of an overall risk management strategy to avoid potential cost and schedule risks by segregating structures and facilities into scope segments of similar risk. Phase I structures and facilities represent the least schedule risk, while Phase II and Phase III activities have increased schedule risks due to the potential for operational delays of the AWR waste retrieval and Silos 1 and 2 treatment processes, respectively. This contracting strategy allows maximum flexibility. Upon completion of the base contract D&D scope (Phase I), should the Phase II and Phase III activities become delayed and impede the Contractor's ability to proceed, the contract options do not have to be exercised.

The Contractor's scope and requirements for performing the D&D of the Silos 1 and 2 remediation facilities includes the requirements for managing perched water, excavated soils, debris/waste handling criteria; removing/fixing radiological contamination; and decontamination of Contractor-provided tools, equipment and materials; structural steel dismantlements; equipment dismantlement; interior dismantlement; and ventilation and containment.

Perched Water

Based on the OU4 site characterization data, areas of soil containing perched water will be encountered during soil excavation activities. It is assumed that if perched water is encountered during Silos 1 and 2 D&D activities (e.g., K-65 trench removal, Decant Sump Tank removal, or Silos 1 and 2 underdrain system removal) the water will be collected and pumped to either the Waste Pit Area Stormwater Runoff Control System (FEMP Site Structure 18N) or the Silos 1 and 2 remediation facilities for further treatment. It is assumed that no sampling of the water would be required.

Excavated Soils

The D&D Contractor will only excavate soils that are necessary to remediate the Silos 1 and 2 at- or below-grade structures. The excavated soils will be used to temporarily backfill the excavations until final soil remediation is performed by the Soils Division, PBS-06. It is also assumed that the Soils Division will remediate the below grade soils and perched water immediately following the completion of the Silos D&D activities. Therefore, no long-term maintenance is planned by the Silos Project beyond placing a temporary tarp over the excavated areas to control stormwater from entering the areas.

Debris/Waste Handling Criteria

The D&D Contractor will be required to handle and containerize debris/waste generated during the dismantlement of processing and support facilities. Debris/waste will be segregated into established categories and containerized accordingly. This includes, but is not limited to, the following:

- Segregation of debris/waste
- Containerization of debris/waste
- Movement of containers within the construction zone; and
- Weighing and tagging containers.

Fluor Fernald will provide the D&D Contractor with the Material Segregation and Containerization Criteria (MSCC) categories (**Appendix D**) of debris/waste and the D&D Contractor will be required to package waste to meet the requirements using Fluor Fernald supervisors and FAT&LC labor.

Fluor Fernald will provide appropriate containers to support facility dismantlement activities. The D&D Contractor shall supply all equipment related to move containers, between and within the Silos 1 and 2 work zone area and construction zone, as well as all equipment to load containers and transport to a designated staging area.

The D&D Contractor will transport filled containers to the designated area where Fluor Fernald will assume responsibility for the containers transportation and disposal.

Removing/Fixing Radiological Contamination

The D&D Contractor will be required to decontaminate all dismantlement equipment or structural debris to a level that permits removal of the equipment from a local containment, enclosure, or permits opening the remedial facilities to the environment. This includes, but is not limited to:

- Decontaminating low-level uranium and thorium-contaminated equipment, materials, structural members, and/or buildings;
- Decontaminating and treating RCRA-contaminated equipment and materials;
- Managing, including treatment and handling, effluent produced during the removal and/or fixing of contamination; and
- Fixing contamination.

The D&D Contractor will establish an inspection area to allow Fluor Fernald to inspect waste materials and perform radiological surveying.

The D&D Contractor will supply all material and equipment required to remove and/or fix contamination.

The D&D Contractor will collect all waste and effluent generated while removing and/or fixing contamination. Effluent will be collected in accordance with the specified requirements and placed in a staging tanks for sampling and analysis. Fluor Fernald will review analytical data and determine whether the rinseate needs to be treated by the Contractor or if the rinseate can be released to the AWWT for final treatment and discharge. The Contractor will supply all equipment required to control and treat rinseate produced during removal and/or fixation of contaminants to meet the AWWT acceptance criteria.

Decontamination of Contractor Provided Tools, Equipment, and Material

Based upon the Contractor's D&D strategy, the D&D Contractor will identify preventative measures for and decontamination of Contractor-provided tools, equipment (including vehicles), and material to a level that permits removal from an enclosure/work zone; restricted reuse, or unrestricted release. This includes, but is not limited to:

- Preventative measures/waste minimization;
- Decontamination area requirements;
- Methods of decontamination activities;
- Control of effluent and waste management activities; and
- Relocation, reuse, and release activities for tools, equipment, and material.

Hand tools and portable tools, less than \$1,000, used in contaminated areas for performance of the contract will be considered expendable.

All Contractor-furnished tools, vehicles, equipment, and material will be inspected for radioactive contamination by Fluor Fernald radiological control personnel prior to initial entry and upon removal from the radiological control area. Fluor Fernald will supply all survey instrumentation used to inspect for radiological contamination.

Tools and equipment used inside an enclosure/building shall be decontaminated at an existing indoor debris washing location.

Structural Steel Dismantlement

Prior to dismantlement, the D&D Contractor will ensure that adequate laydown space has been cleared and access barriers have been established. The D&D Contractor will dismantle, shear, and segregate the structural steel. Control of fugitive emissions will be maintained at all times during this removal work to minimize visible dust. All building materials will be size reduced and managed in accordance with the MSCC specifications (Appendix D).

Equipment Dismantlement

The D&D Contractor will be responsible for the removal or dismantlement of all equipment from within or outside the Silos 1 and 2 treatment facility and support facilities. The D&D Contractor will remove any residual process material (hold-up) from equipment to the maximum extent practical. Control of fugitive emissions will be maintained at all times during this removal work. The Control will seal all openings after cleaning and verification inspection by Fluor Fernald.

Interior Dismantlement

The D&D Contractor will be responsible for the removal of demolition debris materials within the facility and support items within or outside the facility. In accordance with the MSCC, segregation of demolition debris into various waste streams and preparation for containerization shall include, but not be limited to, the following:

- Conduit;
- Wire;
- Electrical boxes (junction, switch);
- Conductors;
- Lighting fixtures;
- Motor operated valves;
- Lighting station;
- Raceway and troughs;
- Cable trays;
- Piping;
- Assorted valves, fittings, elbows, gauges, spool pieces, etc.;
- Ductwork, plenums, branches, etc.; and
- Miscellaneous similar items.

The Contractor will remove any residual process material from the demolition debris to the maximum extent practical. The Contractor will provide all tools and equipment required for demolition debris material removal, and to seal all openings, prevent spillage, or migration of contaminants.

Ventilation and Containment

The D&D Contractor will provide all enclosures, local containment and ventilation to establish and maintain radiological contamination control. Fluor Fernald will provide HEPA filter units, the D&D Contractor will provide filter replacements. Fluor Fernald will perform polyaphaolefin testing on the filter prior to their use. The Contractor will ensure that all local containments maintain negative air pressures and comply with all technical and safety requirements.

Dismantlement Submittals

F07-001

~~The D&D Contractor will submit a Dismantlement Work Plan meeting the requirement of Appendix A, Section 7.7.~~ A copy of the Dismantlement Work Plan will be provided to the DOE-FEMP and EPA/OEPA for information only.

Demobilization

Demobilization shall consist of removal of all the D&D Contractor's temporary facilities and equipment and submittal of all required documentation to close out the project.

Authorization to Demobilize

Upon completion of dismantlement activities, the Contractor will request in writing from Fluor Fernald, written approval to begin demobilization activities.

Following verification of the Contractor's completion of dismantlement work, proper treatment and disposal of waste, completion of any necessary site restoration activities, Fluor Fernald will provide written approval for the Contractor to demobilize.

Removal of Temporary Structures

The Contractor shall remove from the FEMP all temporary facilities and equipment installed under its contract. All items leaving the site must have a radiological survey, and otherwise meet the criteria for release in its contract.

Support of demobilization activities shall be performed by FAT&LC and GCBCTC, as required by the Collective Bargaining Agreement or Project Labor Agreement and as specified in the project's Labor Relations/Work Force Utilization Plan.

Site Restoration

The Contractor shall restore the physical conditions within the Silos 1 and 2 Work Zone Area and any areas disturbed by the Contractor outside the work zone to the conditions encountered upon mobilization. Site restoration activities may include, but are not limited to, the following:

- Regrading;
- Reseeding; and
- Repair of damage to existing facilities.

The schedule for the Contractor's D&D and demobilization activities is summarized by Activity No. 101205. Upon receipt of the Contractor's project schedule following contract award, Fluor Fernald will incorporate the schedule details into the baseline. **Table 1.5-115** provides a schedule summary of the D&D Contract activities and the milestones for reporting progress.

**TABLE 1.5-115
 SCHEDULE SUMMARY FOR D&D CONTRACT ACTIVITIES**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
101205	D&D Contract (Hammock)	531	-
113835	D&D Premobilization	80	20%
113829	D&D Contractor Mobilization	30	25%
101150	D&D Phases I & II Activities	220	60%
101200	D&D Phase III Activities	140	90%
101300	D&D Demobilization	40	100%

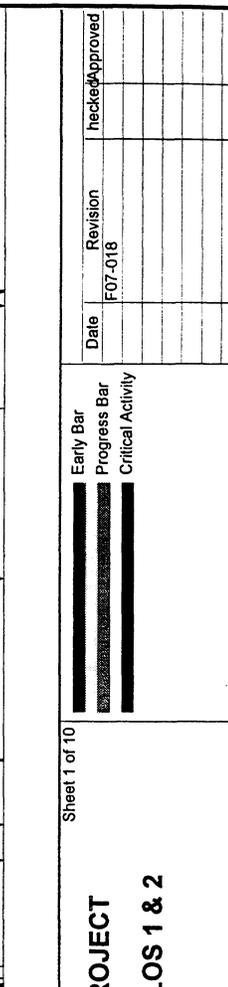
2) Quantification - D&D Contract

The Contractor's resources for the D&D Activities and demobilization activities will be spread in accordance with the Contractor's pay item schedule. The D&D contract value will be managed and reported under charge number HS1AR. The Fluor Fernald support of the D&D Contractor's Demobilization activities are summarized in **Section 1.5.13, "D&D Subcontract Management and Support."**

SECTION 4

2.0 SCHEDULE

Activity ID	Activity Description	Early Start	Early Finish	Orig Dur	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
H PBS07 - SILOS															
1.1.H.D SILOS 1 & 2															
HS1A1	ENG SUPPORT OF CONSTR, STARTUP, OPS & D&D-FFI	29APR03	24APR08	1,118											
HSD101750	FFI Eng Support of Constr/Startup/Ops/D&D														
HS1A2	ENG SUPPORT OF CONSTR, STARTUP, OPS & D&D-JACOBS	29APR03	31DEC07	1,046											
HSD101748	Jacobs Support of Constr/Startup/Ops/D&D														
HS1AA	PROJECT OVERSIGHT														
HSD200110	Project Management FY01	01DEC00	27SEP01	186											
HSD200120	Project Management FY02	01OCT01	30SEP02	224											
HSD200130	Project Management FY03	01OCT02	30SEP03	224											
HSD100020	Work Force Planning	06MAY03	02MAR04	184											
HSD200140	Project Management FY04	01OCT03	30SEP04	225											
HSD200150	Project Management FY05	01OCT04	30SEP05	224											
HSD200160	Project Management FY06	03OCT05	29SEP06	223											
HSD200170	Project Management FY07	02OCT06	28SEP07	223											
HSD101450	Project Closure Documentation	23JAN07	23AUG07	134											
HSD200180	Project Management FY08	01OCT07	23JUN08	163											
HSD101400	Project Closeout	28APR08	23JUN08	36											
HSD101500	Silos - COMPLETE		23JUN08	0											
HS1AB	DESIGN DATA DEVELOPMENT														
HSD102202	Design Data Development Work Plan	02JAN01	01JUN01	95											
HSD102235	Collect and Ship Silo Material	13FEB01	30AUG01	125											
HSD102215	Design Data Development Program	18SEP01	15JAN02	72											
HSD102223	Final Report	16OCT01	27FEB02	81											



SILOS PROJECT
1.1.H.D SILOS 1 & 2

Sheet 1 of 10

Start Date	01DEC00	BLCF - HS01
Finish Date	23JUN08	
Data Date	01DEC00	
Run Date	10SEP01 16:50	

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Date	Revision	Checked/Approved
	F07-018	

Activity ID	Activity Description	Early Start	Early Finish	Orig Dur	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
HS1AK STARTUP/READINESS															
HSD106002	Complete FF ORR	30JAN06	16MAR06	30											
HSD106022	Complete DOE ORR	17MAR06	09MAY06	33											
HSD113820	CD-4 Approval of DOE ORR		09MAY06	0											
HS1AL OPERATIONS & MAINTENANCE															
HSD100040	O & M Design Support	01OCT01	28APR03	351											
HSD109920	Laboratory Utilization Plan	13MAY02	16OCT02	99											
HSD122000	Laboratory Services Procurement	17OCT02	21AUG03	189											
HSD100045	O & M IFB Support	29APR03	02MAR04	189											
HSD100034	Establish Consumable Contracts(ID/IQ)	17OCT03	15OCT04	224											
HSD100050	O & M Training	05APR05	03AUG05	76											
HSD100055	O & M SOT Support	04AUG05	10NOV05	63											
HSD100060	O & M ORR Support	14NOV05	10MAY06	108											
HSD104810	RCS Operations	02MAR06	10MAY06	44											
HSD101005	Start Operations	11MAY06		0											
HSD101000	Operations	11MAY06	10MAY07	224											
HSD101010	Complete Operations		10MAY07	0											
HS1AM WASTE OPERATIONS															
HSD102300	Container IFB Package	12SEP02	14JUL03	186											
HSD113919	Waste Disposition Support of Construction	29APR03	04APR05	433											
HSD122323	Manufacture Prototypes & Validate	15JUL03	17MAY04	189											
HSD113920	Waste Disposition Training	05APR05	03AUG05	76											
HSD113925	Waste Disposition SOT Support	04AUG05	10NOV05	63											
HSD113930	Waste Disposition ORR Support	14NOV05	10MAY06	108											

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SILOS PROJECT

1.1.H.D SILOS 1 & 2

Start Date: 01DEC00
 Finish Date: 23JUN08
 Data Date: 01DEC00
 Run Date: 10SEP01 16:50

10SEP01 16:50

Sheet 5 of 10

Early Bar: Early Bar
 Progress Bar
 Critical Activity

Date: F07-018

Revision: F07-018

Checked/Approved: _____

Activity ID	Activity Description	Early Start	Early Finish	Orig Dur	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
HSD122405	HS1AU CONTAINER CONTRACT Fabricate Containers	18MAY04	14NOV06	560	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲	▲▲▲▲▲
HSD106510	HS1AV PRELIMINARY DESIGN-FFI SBD Implementation Plan	02APR01	27JUL01	74	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD114048	Project Team Present SBD Implementation Plan	30MAY01		0	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD101850	Preliminary Container Design Package	06JUN01	06DEC01	114	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD100017	RDWP(BY FF)	19JUL01	14JAN02	108	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108000	Preliminary Safety Basis Document	01AUG01	01APR02	147	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD101670	Preliminary Design Package-FFI	01AUG01	27AUG02	241	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD100043	Submit Draft RDWP to EPA	01OCT01		0	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108832	Prepare Draft RD Pkg(Advanced Constr Pkgs)	01OCT01	25OCT01	18	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108842	FF/DOE Review Draft RD Pkg(Advanced Constr Pkgs)	29OCT01	08NOV01	9	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108843	Develop CRD-Draft RD Pkg(Advanced Constr Pkgs)	13NOV01	19NOV01	5	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108846	Finalize Draft RD Pkg(Advanced Constr Pkgs)	20NOV01	28NOV01	4	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108850	FF/DOE Review/Accept Final Draft RD Pkg(Adv Pkg)	29NOV01	05DEC01	5	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108852	Submit Draft RD Package to EPA(Adv Pkgs)	06DEC01		0	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108854	EPA Review Draft RD Pkg(Advanced Constr Pkgs)	06DEC01	05FEB02	36	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD101860	Final Container Design Package	10DEC01	01APR02	68	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD100054	Submit Final RDWP to EPA	13DEC01		0	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108858	FF/DOE Review and Draft RD Pkg RTC(Adv Pkgs)	06FEB02	11FEB02	4	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108420	Preliminary Documented Safety Analysis(PDSA)	08FEB02	10OCT02	153	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108859	EPA Concur RD Pkg RTC(Advanced Constr Pkgs)	12FEB02	12FEB02	1	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
HSD108862	Revise Final RD Pkg(Advanced Constr Pkgs)	13FEB02	27FEB02	9	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼

FLUOR FERNALD

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Start Date: 01DEC00
Finish Date: 23JUN08
Data Date: 01DEC00
Run Date: 10SEP01 16:50

SILOS PROJECT

1.1.H.D SILOS 1 & 2

Sheet 7 of 10

Early Bar

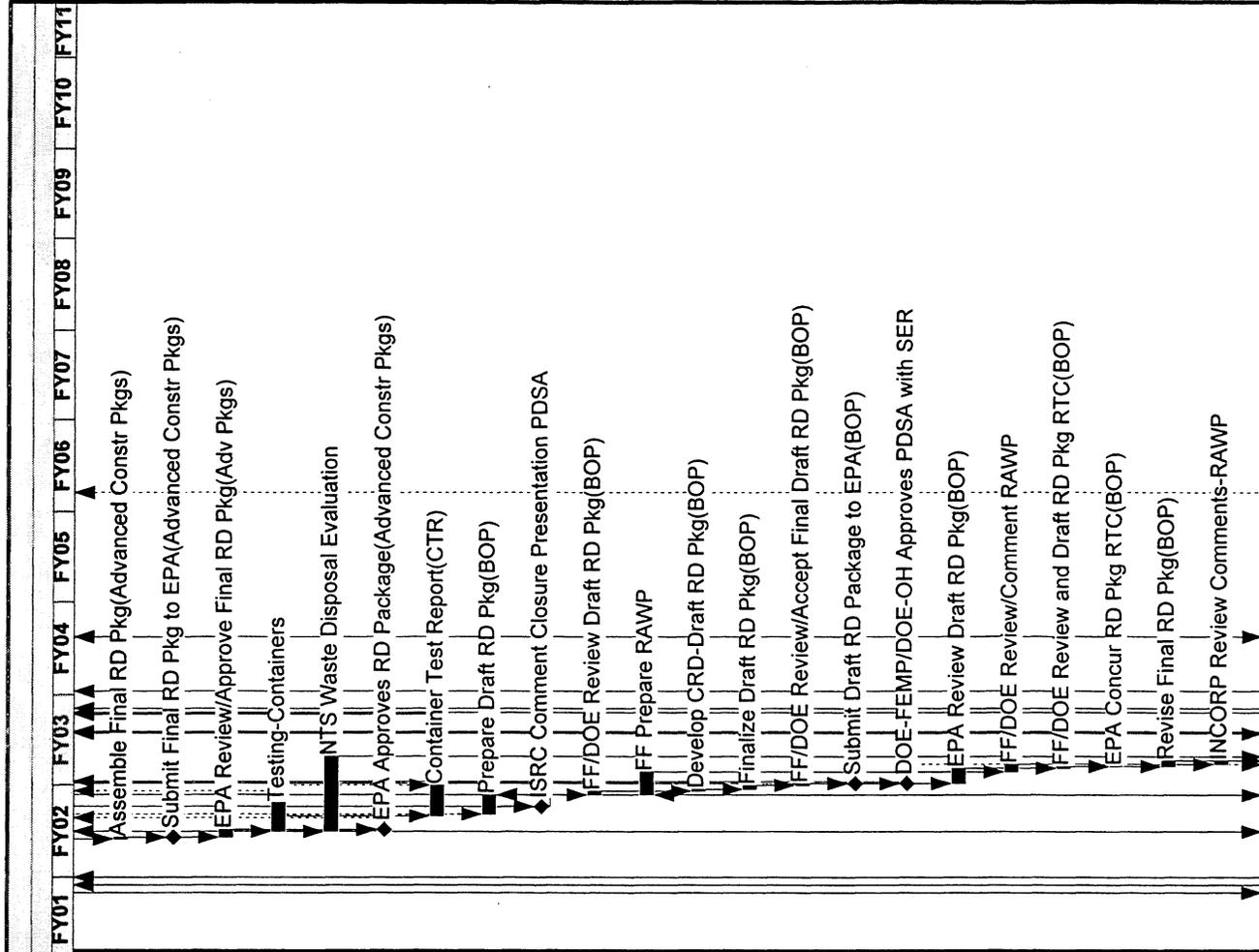
Progress Bar

Critical Activity

Revision: F07-018

Checked: Approved

Date: _____



Activity ID	Activity Description	Early Start	Early Finish	Orig Dur
HSD108866	Assemble Final RD Pkg(Advanced Constr Pkgs)	28FEB02	06MAR02	4
HSD108868	Submit Final RD Pkg to EPA(Advanced Constr Pkgs)	07MAR02		0
HSD108870	EPA Review/Approve Final RD Pkg(Adv Pkgs)	07MAR02	04APR02	18
HSD101840	Testing-Containers	02APR02	24JUL02	72
HSD114052	NTS Waste Disposal Evaluation	02APR02	24JAN03	184
HSD111052	EPA Approves RD Package(Advanced Constr Pkgs)		04APR02	0
HSD102100	Container Test Report(CTR)	29MAY02	03OCT02	81
HSD108879	Prepare Draft RD Pkg(BOP)	11JUN02	27AUG02	50
HSD114040	ISRC Comment Closure Presentation PDSA	11JUL02		0
HSD108889	FF/DOE Review Draft RD Pkg(BOP)	28AUG02	11SEP02	9
HSD101964	FF Prepare RAWP	28AUG02	21NOV02	54
HSD108891	Develop CRD-Draft RD Pkg(BOP)	12SEP02	18SEP02	4
HSD108893	Finalize Draft RD Pkg(BOP)	19SEP02	02OCT02	9
HSD108895	FF/DOE Review/Accept Final Draft RD Pkg(BOP)	03OCT02	09OCT02	5
HSD108897	Submit Draft RD Package to EPA(BOP)	10OCT02		0
HSD111060	DOE-FEMP/DOE-OH Approves PDSA with SER		10OCT02	0
HSD108899	EPA Review Draft RD Pkg(BOP)	10OCT02	10DEC02	36
HSD101968	FF/DOE Review/Comment RAWP	25NOV02	23DEC02	17
HSD108901	FF/DOE Review and Draft RD Pkg RTC(BOP)	11DEC02	17DEC02	5
HSD108903	EPA Concur RD Pkg RTC(BOP)	18DEC02	18DEC02	1
HSD108905	Revise Final RD Pkg(BOP)	19DEC02	06JAN03	8
HSD101972	INCORP Review Comments-RAWP	26DEC02	09JAN03	9

Sheet 8 of 10

SILOS PROJECT
1.1.H.D SILOS 1 & 2

01DEC00 | BLCF - H501
23JUN08
01DEC00
10SEP01 16:50

Start Date
Finish Date
Data Date
Run Date

FLUOR FERNALD

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Legend:
 ■ Early Bar
 ■ Progress Bar
 ■ Critical Activity

Date: F07-018
 Revision:
 Checked/Approved:

Activity ID	Activity Description	Early Start	Early Finish	Orig Dur	FY01 FY02 FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11																		
					Gantt Chart																		
HS1AV PRELIMINARY DESIGN-FFI																							
HSD109356	FDF/DOE Complete RTC/Submit Final RA Pkg	06JAN04	06JAN04	1																			
HSD109358	Submit Final RA Pkg to EPA/OEPA	07JAN04		0																			
HSD109360	EPA Review/Approve RTC & Final RA Pkg	07JAN04	03FEB04	18																			
HSD111056	EPA Approval - RA Pkg		03FEB04	0																			
HS1AW PRELIMINARY DESIGN-JACOBS																							
HSD201670	Preliminary Design Package-Jacobs	01AUG01	27AUG02	241																			
HSD101679	Preliminary Design Complete		27AUG02	0																			
HS1AX FINAL DESIGN-FFI																							
HSD101720	Final Design Package-FFI	01APR02	28APR03	242																			
HSD108300	Final Safety Basis Document	27DEC02	11JUN03	103																			
HSD113824	CD-3 DOE Approval to Start Construction		28APR03	0																			
HSD108416	Documented Safety Analysis(DSA)	17MAY04	10NOV05	336																			
HSD108412	DOE Approves DSA with SER		10NOV05	0																			
HS1AY FINAL DESIGN-JACOBS																							
HSD201720	Final Design Package-Jacobs	01APR02	28APR03	242																			
HSD101737	Final Design Complete		28APR03	0																			



FLUOR FERNALD	Start Date	01DEC00	BLCF - HS01	Sheet 10 of 10	SILOS PROJECT 1.1.H.D SILOS 1 & 2	Early Bar Progress Bar Critical Activity	Date	Revision	Checked/Approved
	Finish Date	23JUN08					F07-018		
	Data Date	01DEC00							
	Run Date	10SEP01 16:50							

SECTION 4

3.0 MANPOWER PLANS

Manpower Planning Sheet (CR2)

MPS # 1HD01 PROJECT OVERSIGHT

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4																				
Environmental Safety & H			19.40	0	0	0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.3	1.3	1.3	1.6	0.6	0.6	1	1
Safety & Health Mgr.																											
Administration			14.80	0	0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	0	0	0.6	0.6	0.6	1	1
Secretaries																											
Administration			30.00	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Secretaries																											
Administration			15.50	0	0	0	0	0	0	0	0	0	0	2	2	2	2	0.8	0.8	0.8	0.8	0.9	1	0.6	0.6	0.6	0.6
Technical Writer																											
Project Management			10.70	0	0	0	0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.4	2	0.4	0.4	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0
Tech/Program Support Mgr.																											
Project Management			10.50	0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	1
Tech/Program Support Rep.																											
Project Management			15.40	0	0	0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.6	1	1
Tech/Program Support Rep.																											
Project Management			9.80	0	0	0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.7	0.7	1	1	1	1	0
Tech/Program Support Rep.																											
Project Management			30.40	0.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tech/Program Support Rep.																											
Training			10.00	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	0
Training Representative																											

Sheet Totals: 487.50 0.40 4.80 5.50 7.50 8.90 9.50 9.80 9.80 10.40 9.70 12.70 12.70 14.10 15.10 15.40 15.90 19.10 19.10 18.90 22.60 21.90 22.10 25.70 23.40

Manpower Planning Sheet (CR2)

MPS # 1HD03 DESIGN/DESIGN OVERSIGHT

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006							
				Q1	Q2	Q3	Q4																								
718 Silo 1 & 2 Title I & II Design	07/26/2001	04/28/2003	0.80	0	0.2	0.2	0.2	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
719 Silo 1 & 2 Title III Services	04/29/2003	11/29/2005	3.20	0	1	1	0.6	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720 Silo 1 & 2 Container Design & Testing	01/02/2001	09/25/2002	0.20	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
721 Silo 1 & 2 RD & RA Deliverables	10/01/2001	10/29/2003	0.60	0	0	0	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
722 Silo 1 & 2 Safety Basis Documentation	04/02/2001	11/10/2005	2.00	0	0.5	1	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
723 Silo 1 & 2 FSAR	02/19/2003	11/10/2005	1.50	0	0.5	0.5	0.1	0.1	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
724 Silo 1 & 2 Long Lead Procurement Activities	05/30/2002	09/08/2003	3.60	0	1	0.5	0.8	0.8	0.4	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7010 Silo 1 & 2 PSAR	01/14/2002	09/13/2002	2.30	0	0	0	0	1	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.20	0	0	0	0	0.5	0.5	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0.80	0	0.2	0.2	0.2	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer Civil		0.80	0	0.2	0.2	0.2	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		3.20	0	1	1	0.6	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		0.20	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		0.60	0	0	0	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		2.00	0	0.5	1	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations Labor	Engineer: Process & Startup		1.50	0	0.5	0.5	0.1	0.1	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		3.60	0	1	0.5	0.8	0.8	0.4	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Management	Waste Engineer		2.30	0	0	0	0	1	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Management	Waste Engineering Mgr.		1.20	0	0	0	0	0.5	0.5	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheet Totals:			15.40	0.00	3.20	3.20	2.20	2.20	0.90	2.70	0.80	0.00																			

Manpower Planning Sheet (CR2)

MPS # 1HD04 CONSTRUCTION MANAGEMENT

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
725 Silo 1 & 2 Construction Design Support	02/19/2002	04/28/2003	7.20	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.7	0.5	0.5	1	1	1	1	0	0	0	0
726 Silo 1 & 2 Construction IFB Packages	04/29/2003	03/02/2004	6.80	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	1	0.5	0.5	1	1	1	0.3	0	0	0	0
727 Silo 1 & 2 Construction Management	03/03/2004	08/03/2005	4.30	0	0	0	0	0	0	0	0	0	0	0.3	0	0	1	1	1	1	0	0	0	0	0	0	0
7011 Silo 1 & 2 Civil Contract	05/17/2004	04/11/2005	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	1	1	1	0	0	0	0	0
7012 Silo 1 & 2 Mechanical Contract	05/17/2004	04/11/2005	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7013 Silo 1 & 2 Electrical Contract	05/17/2004	04/11/2005	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7014 Silo 1 & 2 CAT/ICAT	05/17/2004	08/03/2005	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction Coordinator			7.20	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.7	0.5	0.5	1	1	1	1	0	0	0	0
Construction Coordinator			6.80	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	1	0.5	0.5	1	1	1	0.3	0	0	0	0
Construction Coordinator			4.30	0	0	0	0	0	0	0	0	0	0	0.3	0	0	1	1	1	1	0	0	0	0	0	0	0
Construction Engineer			4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	1	1	1	0	0	0	0	0
Construction Engineer			4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction Engineer			6.00	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Construction Engineer			7.00	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	0	0	0	0
Construction Engineer			5.50	0	0	0	0	0	0	0	0	0	0	0.8	0	0	0.7	0.5	0.5	1	1	1	0	0	0	0	0
Construction Engineer			6.50	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	0	0	0	0
Construction Engineer			7.50	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	0	0	0	0
Engineering & Design			7.90	0	0	0	0	0	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	1	1	1	1	1	0.7	0	0	0	0
Engineering & Design			14.60	0	0	0	0	1	1	1	1	1	1	1.3	1	1	1.3	1	1	1	1	0	0	0	0	0	0
QA/QC			9.00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.3	1	1	1	1	0.7	0	0	0	0
QA/QC			28.30	0	0	0	0	0	0	0	0	0	0	1.3	1	2	2.7	4	4	4	4	4	1.3	0	0	0	0
Environmental Safety & H Rad Tech			14.00	0	0	0	0	0	0	0	0	0	0	0	0	0	2.7	2	2	2	2	2	1.3	0	0	0	0
Environmental Safety & H Safety Engineer			12.00	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Environmental Safety & H Safety Engineer			4.80	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0
Waste Management			9.00	0	0	0	0	0	0	0	0	0	0	0	0	1	1.3	1	1	1	1	1	0.7	0	0	0	0
Waste Management			4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.7	0.5	0.5	0.5	0.5	0.3	0	0	0	0

Sheet Totals: 162.40 0.00 0.00 0.00 1.00 1.30 1.20 2.70 8.80 9.20 10.70 18.20 17.50 17.50 20.00 20.00 19.00 11.30 0.00 0.00 0.00 0.00

Manpower Planning Sheet (CR2)

MPS # 1HD06 START-UP/READINESS

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006															
				Q1	Q2	Q3	Q4																																
728 Silo 1 & 2 Startup Management	01/17/2003	05/09/2006	9.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729 Silo 1 & 2 Training Development	04/29/2003	04/18/2005	11.50	0	0	0	0	0	0	0	0	0	0	0.3	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
730 Silo 1 & 2 Perform. Training	04/05/2005	12/13/2005	4.50	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
731 Silo 1 & 2 SOT	08/04/2005	11/10/2005	7.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
732 Silo 1 & 2 Readiness Preparations for ORR	05/17/2004	05/09/2006	8.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QA/QC	QA Engineer		9.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QA/QC	QA/QC Tech.		11.50	0	0	0	0	0	0	0	0	0	0	0.3	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Environmental Safety & H	Safety Engineer		4.50	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		7.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		8.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheet Totals:				41.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	1.00	1.50	2.50	3.50	3.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.00	4.00	4.00	4.00	2.70	2.70	2.70	2.70				

Manpower Planning Sheet (CR2)

MPS # 1HD07 OPERATIONS & MAINTENANCE

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006											
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4								
733 Silo 1 & 2 Laboratory Utilization Plan	07/26/2002	01/06/2003	305.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	41.6	40	38.4
734 Silo 1 & 2 Laboratory Services Procurement	01/07/2003	11/04/2003	59.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
735 AWR TTA Operations	10/06/2003	08/19/2004	2.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.3	0.5	0.2
736 RCS Operations	12/02/2004	05/09/2006	72.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.6	10.1	10.1	9.1				
737 Silo 1 & 2 Operations	05/11/2006	05/10/2007	84.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.6	11.7	12	11.3				
General Labor	Chemical Operator		305.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
Lab	Chemist		59.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13				
Craft Labor	Carpenter		2.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.3	0.5	0.2				
Craft Labor	Electrician		72.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.6	10.1	10.1	9.1				
Operations Labor	Engineer: Process & Startup		84.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.6	11.7	12	11.3				
Environmental	Environmental Scientist Tech.		4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
Transportation Labor	Heavy Equipment Operator		38.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.5	5.6	5.5	5.1				
Craft Labor	Instrument Mechanic		73.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.6	10.8	11.7	9.1				
Subcontract	Subcontract Staff		45.00	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				
Subcontract	Subcontract Staff		22.50	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Craft Labor	Machinist		0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1				
Craft Labor	Millwright		73.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.6	10.8	11.7	9.1				
Maintenance	Maintenance Manager		55.40	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	8	8	6				
Maintenance	Maintenance Rep.		0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Maintenance	Maintenance Rep.		24.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.5	0.5	0	0	0	0	0	0	4	3.2	4.7	2.4				
Craft Labor	Oiler (Maintenance)		1.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.2	0.2	0.2				
Operations	Operations Manager		12.20	0	0	0	0	0	0	0	0	0	0	0.7	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1				
Operations	Operations Manager		101.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.5	14.6	14.6	13				
Craft Labor	Painter		1.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.2	0.2	0.2				
Craft Labor	Pipefitter		73.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.6	10.8	11.7	9.1				
Maintenance	Project Support Rep.		10.80	0	0	0	0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	0	0	0	0	0	0	0	0	0	1	1	1	1				
Environmental Safety & H	Rad Engineer		12.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1	2.5	2.8	2				
Environmental Safety & H	Rad Supervisor/Manager		6.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1				
Environmental Safety & H	Rad Supervisor/Manager		3.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5				
Environmental Safety & H	Rad Tech		143.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.3	19.5	19.5	18				
Craft Labor	Rigger		8.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1				

Manpower Planning Sheet (CR2)

MPS # 1HD09 SAFE SHUTDOWN

DRIVERS	START DATE	END DATE	FY 2007			FY 2008			FY 2009			FY 2010			FY 2011		
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
743 Silo 1 & 2 Facility Shutdown Workplan(FSW	05/11/2006	01/30/2007	xxx X														
744 Silo 1 & 2 Facility Shutdown	05/11/2007	10/30/2007	xxx X	xx	xxx	X											
General Labor			0	0	9	12	2	0	0	0	0	0	0	0	0	0	0
Craft Labor			0	0	1	1.3	1	0	0	0	0	0	0	0	0	0	0
Craft Labor			0	0	2.7	3.3	1	0	0	0	0	0	0	0	0	0	0
Operations Labor			0	0	1	2	1	0	0	0	0	0	0	0	0	0	0
Environmental			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation Labor			0	0	2.7	2.7	1	0	0	0	0	0	0	0	0	0	0
Craft Labor			0	0	2.7	3.3	1	0	0	0	0	0	0	0	0	0	0
Subcontract			0	0	0	2	1	0	0	0	0	0	0	0	0	0	0
Subcontract			0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Lab			0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Craft Labor			0	0	2.7	3.3	1	0	0	0	0	0	0	0	0	0	0
Maintenance			0	0	0.5	0.7	0.3	0	0	0	0	0	0	0	0	0	0
Maintenance			0	0	0.5	1	0.7	0	0	0	0	0	0	0	0	0	0
Transportation Labor			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations			0	0	0.7	1	1	0	0	0	0	0	0	0	0	0	0
Operations			0	0	0.7	2	1	0	0	0	0	0	0	0	0	0	0
Craft Labor			0	0	2.7	3.3	0.8	0	0	0	0	0	0	0	0	0	0
Maintenance			0	0	0.7	0.7	0.3	0	0	0	0	0	0	0	0	0	0
Environmental Safety & Health			0	0	0.7	1	0.7	0	0	0	0	0	0	0	0	0	0
Environmental Safety & Health			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & Health			0	0	5	6.7	1.5	0	0	0	0	0	0	0	0	0	0
Craft Labor			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & Health			0	0	1.3	1.7	0.5	0	0	0	0	0	0	0	0	0	0
Environmental Safety & Health			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation Labor			0	0	1.3	2	0.8	0	0	0	0	0	0	0	0	0	0
Waste Management			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Management			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sheet Totals: 0.00 0.00 35.90 52.00 18.60 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Manpower Planning Sheet (CR2)

MPS # 1HD10 D&D SUPPORT

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006											
				Q1	Q2	Q3	Q4																												
745 Silo 1 & 2 D & D Implementation Plan	06/01/2004	04/18/2005	11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
746 Silo 1 & 2 Develop D & D RFP	04/19/2005	09/29/2005	11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
747 Silo 1 & 2 Bid & Award D & D Pkg	09/30/2005	03/13/2006	11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
748 silo 1 & 2 D & D Contract Management	03/14/2006	06/23/2008	11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
749 Silo 1 & 2 D & D CONTRACT	03/14/2006	04/25/2008	11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Construction	Construction Coordinator		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Construction	Construction Engineer		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Construction	Construction Engineer		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Construction	Construction Engineer		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Construction	Construction Engineer		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Construction	Construction Engineer		13.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1
Environmental	Environmental Scientist Tech.		1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
General Labor	Hazwat		52.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8
Transportation Labor	Heavy Equipment Operator		40.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5
Lab	Lab Tech.		1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation Labor	Motor Vehicle Operator		39.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	4
QA/QC	QA Engineer		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
QA/QC	QA/QC Tech.		54.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	6
Environmental Safety & H	Rad Engineer		12.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1.3	1	1	1	1	1	1	1	1
Environmental Safety & H	Rad Supervisor/Manager		8.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Environmental Safety & H	Rad Tech		79.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	8	8
Environmental Safety & H	Safety Engineer		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Environmental Safety & H	Safety Tech.		11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Transportation Labor	Transportation Laborer		102.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	12	10
Waste Management	Waste Engineer		10.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Waste Management	Waste Engineer		14.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Waste Management	Waste Engineering Mgr.		9.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Sheet Totals:			523.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	4.00	8.40	19.00	22.00	46.00	54.00	

Manpower Planning Sheet (CR2)

MPS # 1HD11 PRELIMINARY DESIGN - FERNALD

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006							
				Q1	Q2	Q3	Q4																								
Engineering & Design			0.40	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer Civil																															
Engineering & Design			1.50	0	0	0	0	0.3	0.4	0.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Engineering & Design			0.60	0	0	0	0	0	0.2	0.2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Engineering & Design			1.20	0	0	0	0	0	0.4	0.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Engineering & Design			1.50	0	0	0	0.1	0.3	0.3	0.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Operations Labor			1.10	0	0	0	0.1	0.1	0.1	0.3	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer: Process & Startup																															
Project Management			2.20	0	0	0	0.2	0.1	0.6	0.8	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tech/Program Support Rep.																															
Waste Management			2.00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Engineer																															
Waste Management			1.00	0	0	0	0	0	0	0.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Engineering Mgr.																															
Sheet Totals:				11.50	0.00	0.00	0.00	0.40	0.90	2.10	4.10	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Manpower Planning Sheet (CR2)

MPS # 1HD12 FINAL DESIGN - FERNALD

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006							
				#Er																											
Engineering & Design			0.70	0	0	0	0	0	0	0.1	0.1	0.2	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer Civil																															
Engineering & Design			3.40	0	0	0	0	0	0	0.5	0.5	0.8	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Engineering & Design			1.40	0	0	0	0	0	0	0.2	0.2	0.4	0.4	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Engineering & Design			4.20	0	0	0	0	0	0	0	1	1.4	1.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Engineering & Design			2.60	0	0	0	0	0	0	0.3	0.3	0.7	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer																															
Operations Labor			2.60	0	0	0	0	0	0	0.2	0.4	0.7	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer: Process & Startup																															
Project Management			3.00	0	0	0	0	0	0	0.2	0.5	1	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tech/Program Support Rep.																															
Waste Management			3.20	0	0	0	0	0	0	0	0.5	1	1	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Engineer																															
Waste Management			1.20	0	0	0	0	0	0	0	0.2	0.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Engineering Mgr.																															
Sheet Totals:			22.30	0.00	0.00	0.00	0.00	1.50	3.70	6.80	7.50	2.80	0.00																		

Manpower Planning Sheet (CR2)

MPS # 1HD13 ENG SUPT CONSTR STARTUP OPS AND D&D - FE

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4																				
Engineering & Design			1.00	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0
Engineer/CAD Operator																											
Engineering & Design			4.10	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.2	0.2	0.7	0.7	1	1	0	0	0	0	0	0
Engineer Civil																											
Engineering & Design			12.00	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
Engineer																											
Engineering & Design			7.00	0	0	0	0	0	0	0	0	0	0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	1	1	1	1
Engineer																											
Engineering & Design			3.20	0	0	0	0	0	0	0	0	0	0	1	1.4	0.4	0.4	0	0	0	0	0	0	0	0	0	0
Engineer																											
Operations Labor			1.30	0	0	0	0	0	0	0	0	0	0	0.3	1	0	0	0	0	0	0	0	0	0	0	0	0
Engineer: Process & Startup																											
Project Management			20.30	0	0	0	0	0	0	0	0	0	0	0.3	1	1	1	1	1	1	1	1	1	1	1	1	1
Tech/Program Support Rep.																											
Waste Management			0.80	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0	0	0	0	0	0	0	0	0	0	0
Waste Engineering Mgr.																											
Sheet Totals:			49.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.20	5.60	3.10	3.10	3.20	3.20	3.50	3.50	2.50	2.80	3.00	3.00	3.00	1.00

SECTION 4

4.0 ESTIMATE

HS1AA

PROJECT OVERSIGHT

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
[REDACTED]
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07

WBS: 1.1.H.D

CTRL ACCT: HS1A

CHARGE NO: HS1AA PROJECT OVERSIGHT

COMMENT#: F07-056

Resource: BUYCON

Res Dept: 943

LABOR

EOC: SAL

Class:

BUYER/CONTRACTS ADMIN

Overtime:

Yr	Hours	Oct 00	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09
Sep 01	736.6	1,747.0	1,747.0	1,747.0	1,747.0	1,747.0	1,732.8	1,732.5	1,277.2	0.0	0.0
Cum Hours:	736.6	2,483.6	4,230.6	5,977.6	7,724.6	9,457.4	11,190.0	105,149	81,702	12,467.2	12,467.2
Yr Total Cost:	30,864	77,048	81,609	86,421	91,544	97,012	105,149	569,647	651,349	0	0
Cum Total Cost:	30,864	107,912	189,522	275,943	367,487	464,498	569,647	651,349	651,349	651,349	651,349

Resource: CLERKS

Res Dept: 943

Overtime:

LABOR

EOC: SAL

Class:

CLERKS

Overtime:

Yr	Hours	Oct 00	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09
Sep 01	0.0	267.0	524.1	524.1	524.1	717.6	1,876.0	3,465.0	1,277.2	0.0	0.0
Cum Hours:	0.0	267.0	791.1	1,315.2	2,032.8	3,908.8	7,373.8	119,905	8,651.0	8,651.0	8,651.0
Yr Total Cost:	0	6,714	13,959	14,782	21,440	59,882	119,905	46,584	283,266	0	0
Cum Total Cost:	0	6,714	20,673	35,456	56,896	116,777	236,682	283,266	283,266	283,266	283,266

Resource: CNSMGR

Res Dept: 943

Overtime:

LABOR

EOC: SAL

Class:

CONSTRUCTION MGR

Overtime:

Yr	Hours	Oct 00	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09
Sep 01	0.0	174.7	174.7	174.7	793.0	1,747.0	1,732.8	1,732.5	1,277.2	0.0	0.0
Cum Hours:	0.0	174.7	349.4	524.1	1,317.0	3,064.0	4,800.8	6,533.3	7,810.5	7,810.5	7,810.5
Yr Total Cost:	0	11,403	23,481	23,481	58,056	135,481	143,572	155,616	120,915	0	0
Cum Total Cost:	0	11,403	23,481	23,481	81,537	217,018	360,590	516,206	637,121	637,121	637,121

Resource: CSTANL

Res Dept: 943

Overtime:

LABOR

EOC: SAL

Class:

COST ANALYST

Overtime:

Yr	Hours	Oct 00	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09
Sep 01	0.0	0.0	0.0	0.0	0.0	0.0	471.0	1,732.5	1,277.2	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	471.0	2,203.6	3,480.8	3,480.8	3,480.8
Yr Total Cost:	0	0	0	0	0	0	24,483	97,621	75,852	0	0
Cum Total Cost:	0	0	0	0	0	0	24,483	122,104	197,956	197,956	197,956

Resource: DEPADM

Res Dept: 943

Overtime:

LABOR

EOC: SAL

Class:

DEPT ADMINISTRATOR

Overtime:

Yr	Hours	Oct 00	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09
Sep 01	0.0	1,921.7	595.7	2,517.4	4,193.4	3,494.0	3,465.7	3,465.0	2,554.4	0.0	0.0
Cum Hours:	0.0	1,921.7	2,517.4	5,034.8	9,228.2	12,722.2	16,187.9	19,652.9	22,207.3	22,207.3	22,207.3
Yr Total Cost:	0	64,141	21,060	62,746	138,561	146,837	159,154	17,172.5	123,664	0	0
Cum Total Cost:	0	64,141	85,201	147,947	286,508	433,345	592,500	761,654	885,318	885,318	885,318

Fluor Fernald, Inc.

PBS: OHFN07
WBS: 1 1 H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AA
COMMENT#: F07-056

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

PROJECT OVERSIGHT
(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR R. FELLMAN
CAM: R. FELLMAN
PREPARED BY J. NORTH
FISCAL YEAR: 2001-2008

Cum Total Cost:	0	64,141	85,201	147,947	286,508	433,345	592,499	716,164	716,164	716,164
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Resource:	ENGINEER	Class:	EOC:	LABOR						
Res Dept:	943		SAL							
Yr Hours:	1,012.3	0.0	1,806.6	1,397.6	1,732.8	1,266.2	1,732.8	0.0	0.0	0.0
Cum Hours:	1,012.3	1,012.3	3,114.8	4,512.4	6,245.2	7,511.4	7,511.4	7,511.4	7,511.4	7,511.4
Yr Total Cost:	69,603	0	70,673	95,841	126,109	159,201	126,109	0	0	0
Cum Total Cost:	69,603	69,603	140,275	236,116	356,299	515,500	641,609	641,609	641,609	641,609

Resource:	FIRE PROTECTION ENG	Class:	EOC:	LABOR	LABOR	LABOR	LABOR	LABOR	LABOR	LABOR
Res Dept:	943		SAL							
Yr Hours:	0.0	0.0	174.7	174.7	173.3	173.3	127.7	0.0	0.0	0.0
Cum Hours:	0.0	0.0	349.4	524.1	698.8	872.1	1,045.3	1,173.1	1,173.1	1,173.1
Yr Total Cost:	0	7,977	8,449	9,478	10,044	10,886	8,459	0	0	0
Cum Total Cost:	0	7,977	16,426	25,374	34,851	44,895	55,781	64,240	64,240	64,240

Resource:	INDHYG	Class:	EOC:	LABOR	LABOR	LABOR	LABOR	LABOR	LABOR	LABOR
Res Dept:	943		SAL							
Yr Hours:	213.8	0.0	873.5	1,985.5	3,055.8	2,986.7	1,277.2	0.0	0.0	0.0
Cum Hours:	213.8	1,087.3	1,960.8	4,819.8	7,875.5	10,874.2	12,151.4	12,151.4	12,151.4	12,151.4
Yr Total Cost:	9,923	42,680	45,207	47,872	115,265	189,531	201,629	90,516	0	0
Cum Total Cost:	9,923	52,602	97,809	145,681	260,946	450,477	652,105	742,621	742,621	742,621

Resource:	MATERIAL OBJCLASS300	Class:	EOC:	MATERIAL						
Res Dept:	943		MAT							
Yr Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0

Resource:	MAINTMGR	Class:	EOC:	LABOR						
Res Dept:	943		SAL							
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: H51A
CHARGE NO: HS1AA
COMMENT#: F07-056
PROJECT OVERSIGHT

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
0.0	0.0	0.0	0.0	1,747.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	1,747.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	0	0	0	114,492	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	114,492	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: PJCSCB
Res Dept: 943
SCHEDULERS
Overtime: EOC: SAL

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
85.5	349.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85.5	349.4	784.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3,486	14,994	15,862	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3,486	18,480	34,362	34,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: PJSREP
Res Dept: 943
PROJECT SUPPORT REP
Overtime: EOC: SAL

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
85.5	349.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85.5	349.4	784.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3,486	14,994	15,862	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3,486	18,480	34,362	34,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: PRJMGR
Res Dept: 943
PROJECT MANAGER
Overtime: EOC: SAL

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
1,570.7	2,711.0	2,971.8	3,321.2	4,622.1	5,415.4	3,465.0	3,465.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,570.7	4,281.7	7,253.5	10,574.7	15,198.8	20,612.2	24,077.2	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8	1,826.8
140,045	254,422	295,408	349,605	515,386	645,137	447,499	20,463	0	0	0	0	0	0	0	0	0	0	0	0	0
140,045	394,467	689,876	1,039,481	1,554,867	2,200,005	2,647,503	91,518	91,518	91,518	91,518	91,518	91,518	91,518	91,518	91,518	91,518	91,518	91,518	91,518	91,518

Resource: PURMGR
Res Dept: 943
PROC & CONTRACT MGR
Overtime: EOC: SAL

Yr Hours:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
262.3	349.4	1,138.4	1,747.0	3,497.1	5,244.1	8,709.4	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5
262.3	611.7	1,750.1	3,497.1	5,244.1	6,976.9	8,709.4	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6	9,986.6
16,604	23,280	80,340	130,560	146,559	158,853	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430	123,430
16,604	39,884	120,224	250,783	389,083	535,642	694,495	817,925	817,925	817,925	817,925	817,925	817,925	817,925	817,925	817,925	817,925	817,925	817,925	817,925	817,925

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HSTA
CHARGE NO: HSTAA
COMMENT#: F07-056
PROJECT OVERSIGHT

Resource:	Res Dept:	QA MANAGER	Overtime:	Class:		EOC:		LABOR				
				SAL	SAL	Oct 00-	Oct 09-					
		943		Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
				Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:				482.0	524.1	524.1	717.6	1,404.9	1,732.5	1,277.2	0.0	0.0
Cum Hours:				744.3	1,268.4	1,792.5	2,510.1	3,915.0	5,647.5	6,924.7	6,924.7	6,924.7
Yr Total Cost:				27,305	31,448	33,302	48,300	101,029	135,063	104,945	0	0
Cum Total Cost:				41,422	72,870	106,172	154,473	255,502	390,565	495,510	495,510	495,510

Resource:	Res Dept:	RAD ENGINEER	Overtime:	Class:		EOC:		LABOR				
				SAL	SAL	Oct 00-	Oct 09-					
		943		Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
				Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:				873.5	873.5	873.5	411.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				1,087.3	1,960.8	2,834.3	3,245.3	3,245.3	3,245.3	3,245.3	3,245.3	3,245.3
Yr Total Cost:				43,397	45,966	48,676	24,261	0	0	0	0	0
Cum Total Cost:				53,486	99,453	148,129	172,390	172,390	172,390	172,390	172,390	172,390

Resource:	Res Dept:	SAFETY ENGINEER	Overtime:	Class:		EOC:		LABOR				
				SAL	SAL	Oct 00-	Oct 09-					
		943		Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
				Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:				524.1	524.1	611.5	1,537.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:				524.1	1,048.2	1,659.7	3,197.0	3,197.0	3,197.0	3,197.0	3,197.0	3,197.0
Yr Total Cost:				27,423	29,046	35,885	95,575	0	0	0	0	0
Cum Total Cost:				27,423	56,469	92,355	187,929	187,929	187,929	187,929	187,929	187,929

Resource:	Res Dept:	SAFETY & HEALTH MGR	Overtime:	Class:		EOC:		LABOR				
				SAL	SAL	Oct 00-	Oct 09-					
		943		Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
				Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:				482.0	524.1	524.1	2,414.2	1,404.9	1,732.5	1,277.2	0.0	0.0
Cum Hours:				567.5	1,091.6	1,615.7	4,029.9	5,434.8	7,167.3	8,444.5	8,444.5	8,444.5
Yr Total Cost:				4,739	32,389	34,298	167,356	104,052	139,103	108,084	0	0
Cum Total Cost:				4,739	65,250	99,548	266,904	370,956	510,059	618,144	618,144	618,144

Resource:	Res Dept:	SECRETARIES	Overtime:	Class:		EOC:		LABOR				
				SAL	SAL	Oct 00-	Oct 09-					
		943		Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
				Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:				2,229.0	2,271.1	2,271.1	1,747.0	3,137.7	3,465.0	2,554.4	0.0	0.0
Cum Hours:				3,183.0	5,454.1	7,725.2	9,472.2	12,610.0	16,075.0	18,629.4	18,629.4	18,629.4
Yr Total Cost:				21,303	56,540	59,874	48,787	93,618	112,075	87,084	0	0
Cum Total Cost:				21,303	56,540	59,874	48,787	93,618	112,075	87,084	0	0

Fluor Fernald, Inc.

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: H51A
CHARGE NO: H51AA
COMMENT#: F07-056

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

Cum Total Cost:	21,303	73,694	130,234	190,108	238,895	332,513	444,589	531,672	531,672	531,672	531,672
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SUBCONTRACTORS

Resource:	SERVSUB	Subs	Overtime:	Class:	EOC:		Class:	EOC:	Sub																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Yr Units:		Oct 00- Sep 01	0.0	0.0	Oct 01- Sep 02	390,144.0	390,144.0	390,144.0	390,144.0	Oct 03- Sep 04	482,144.0	482,144.0	482,144.0	482,144.0	Oct 04- Sep 05	594,144.0	594,144.0	594,144.0	594,144.0	Oct 05- Sep 06	624,144.0	624,144.0	624,144.0	624,144.0	Oct 06- Sep 07	471,144.0	471,144.0	471,144.0	471,144.0	Oct 07- Sep 08	390,144.0	390,144.0	390,144.0	390,144.0	Oct 08- Sep 09	0.0	0.0	0.0	0.0	Oct 09- Sep 10	0.0	0.0	0.0	0.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Cum Units:		0.0	0.0	0.0	390,144.0	780,288.0	1,170,432.0	1,564,576.0	1,958,720.0	2,352,864.0	2,747,008.0	3,141,152.0	3,535,300.0	3,929,444.0	4,323,588.0	4,717,732.0	5,111,876.0	5,506,020.0	5,900,164.0	6,294,308.0	6,688,452.0	7,082,596.0	7,476,740.0	7,870,884.0	8,265,028.0	8,659,172.0	9,053,316.0	9,447,460.0	9,841,604.0	10,235,748.0	10,629,892.0	11,024,036.0	11,418,180.0	11,812,324.0	12,206,468.0	12,600,612.0	12,994,756.0	13,388,900.0	13,783,044.0	14,177,188.0	14,571,332.0	14,965,476.0	15,359,620.0	15,753,764.0	16,147,908.0	16,542,052.0	16,936,196.0	17,330,340.0	17,724,484.0	18,118,628.0	18,512,772.0	18,906,916.0	19,301,060.0	19,695,204.0	20,089,348.0	20,483,492.0	20,877,636.0	21,271,780.0	21,665,924.0	22,060,068.0	22,454,212.0	22,848,356.0	23,242,500.0	23,636,644.0	24,030,788.0	24,424,932.0	24,819,076.0	25,213,220.0	25,607,364.0	26,001,508.0	26,395,652.0	26,789,796.0	27,183,940.0	27,578,084.0	27,972,228.0	28,366,372.0	28,760,516.0	29,154,660.0	29,548,804.0	29,942,948.0	30,337,092.0	30,731,236.0	31,125,380.0	31,519,524.0	31,913,668.0	32,307,812.0	32,701,956.0	33,096,100.0	33,490,244.0	33,884,388.0	34,278,532.0	34,672,676.0	35,066,820.0	35,460,964.0	35,855,108.0	36,249,252.0	36,643,396.0	37,037,540.0	37,431,684.0	37,825,828.0	38,219,972.0	38,614,116.0	39,008,260.0	39,402,404.0	39,796,548.0	40,190,692.0	40,584,836.0	40,978,980.0	41,373,124.0	41,767,268.0	42,161,412.0	42,555,556.0	42,949,700.0	43,343,844.0	43,737,988.0	44,132,132.0	44,526,276.0	44,920,420.0	45,314,564.0	45,708,708.0	46,102,852.0	46,496,996.0	46,891,140.0	47,285,284.0	47,679,428.0	48,073,572.0	48,467,716.0	48,861,860.0	49,256,004.0	49,650,148.0	50,044,292.0	50,438,436.0	50,832,580.0	51,226,724.0	51,620,868.0	52,015,012.0	52,409,156.0	52,803,300.0	53,197,444.0	53,591,588.0	53,985,732.0	54,379,876.0	54,774,020.0	55,168,164.0	55,562,308.0	55,956,452.0	56,350,596.0	56,744,740.0	57,138,884.0	57,533,028.0	57,927,172.0	58,321,316.0	58,715,460.0	59,109,604.0	59,503,748.0	59,897,892.0	60,292,036.0	60,686,180.0	61,080,324.0	61,474,468.0	61,868,612.0	62,262,756.0	62,656,900.0	63,051,044.0	63,445,188.0	63,839,332.0	64,233,476.0	64,627,620.0	65,021,764.0	65,415,908.0	65,810,052.0	66,204,196.0	66,598,340.0	66,992,484.0	67,386,628.0	67,780,772.0	68,174,916.0	68,569,060.0	68,963,204.0	69,357,348.0	69,751,492.0	70,145,636.0	70,539,780.0	70,933,924.0	71,328,068.0	71,722,212.0	72,116,356.0	72,510,500.0	72,904,644.0	73,298,788.0	73,692,932.0	74,087,076.0	74,481,220.0	74,875,364.0	75,269,508.0	75,663,652.0	76,057,796.0	76,451,940.0	76,846,084.0	77,240,228.0	77,634,372.0	78,028,516.0	78,422,660.0	78,816,804.0	79,210,948.0	79,605,092.0	80,000,236.0	80,394,380.0	80,788,524.0	81,182,668.0	81,576,812.0	81,970,956.0	82,365,100.0	82,759,244.0	83,153,388.0	83,547,532.0	83,941,676.0	84,335,820.0	84,729,964.0	85,124,108.0	85,518,252.0	85,912,396.0	86,306,540.0	86,700,684.0	87,094,828.0	87,488,972.0	87,883,116.0	88,277,260.0	88,671,404.0	89,065,548.0	89,459,692.0	89,853,836.0	90,247,980.0	90,642,124.0	91,036,268.0	91,430,412.0	91,824,556.0	92,218,700.0	92,612,844.0	93,006,988.0	93,401,132.0	93,795,276.0	94,189,420.0	94,583,564.0	94,977,708.0	95,371,852.0	95,765,996.0	96,160,140.0	96,554,284.0	96,948,428.0	97,342,572.0	97,736,716.0	98,130,860.0	98,525,004.0	98,919,148.0	99,313,292.0	99,707,436.0	100,101,580.0	100,495,724.0	100,889,868.0	101,284,012.0	101,678,156.0	102,072,300.0	102,466,444.0	102,860,588.0	103,254,732.0	103,648,876.0	104,043,020.0	104,437,164.0	104,831,308.0	105,225,452.0	105,619,596.0	106,013,740.0	106,407,884.0	106,802,028.0	107,196,172.0	107,590,316.0	107,984,460.0	108,378,604.0	108,772,748.0	109,166,892.0	109,561,036.0	109,955,180.0	110,349,324.0	110,743,468.0	111,137,612.0	111,531,756.0	111,925,900.0	112,320,044.0	112,714,188.0	113,108,332.0	113,502,476.0	113,896,620.0	114,290,764.0	114,684,908.0	115,079,052.0	115,473,196.0	115,867,340.0	116,261,484.0	116,655,628.0	117,049,772.0	117,443,916.0	117,838,060.0	118,232,204.0	118,626,348.0	119,020,492.0	119,414,636.0	119,808,780.0	120,202,924.0	120,597,068.0	120,991,212.0	121,385,356.0	121,779,500.0	122,173,644.0	122,567,788.0	122,961,932.0	123,356,076.0	123,750,220.0	124,144,364.0	124,538,508.0	124,932,652.0	125,326,796.0	125,720,940.0	126,115,084.0	126,509,228.0	126,903,372.0	127,297,516.0	127,691,660.0	128,085,804.0	128,479,948.0	128,874,092.0	129,268,236.0	129,662,380.0	130,056,524.0	130,450,668.0	130,844,812.0	131,238,956.0	131,633,100.0	132,027,244.0	132,421,388.0	132,815,532.0	133,209,676.0	133,603,820.0	133,997,964.0	134,392,108.0	134,786,252.0	135,180,396.0	135,574,540.0	135,968,684.0	136,362,828.0	136,756,972.0	137,151,116.0	137,545,260.0	137,939,404.0	138,333,548.0	138,727,692.0	139,121,836.0	139,515,980.0	139,910,124.0	140,304,268.0	140,698,412.0	141,092,556.0	141,486,700.0	141,880,844.0	142,274,988.0	142,669,132.0	143,063,276.0	143,457,420.0	143,851,564.0	144,245,708.0	144,639,852.0	145,033,996.0	145,428,140.0	145,822,284.0	146,216,428.0	146,610,572.0	147,004,716.0	147,398,860.0	147,792,904.0	148,187,048.0	148,581,192.0	148,975,336.0	149,369,480.0	149,763,624.0	150,157,768.0	150,551,912.0	150,946,056.0	151,340,200.0	151,734,344.0	152,128,488.0	152,522,632.0	152,916,776.0	153,310,920.0	153,705,064.0	154,099,208.0	154,493,352.0	154,887,496.0	155,281,640.0	155,675,784.0	156,069,928.0	156,464,072.0	156,858,216.0	157,252,360.0	157,646,504.0	158,040,648.0	158,434,792.0	158,828,936.0	159,223,080.0	159,617,224.0	160,011,368.0	160,405,512.0	160,799,656.0	161,193,800.0	161,587,944.0	161,982,088.0	162,376,232.0	162,770,376.0	163,164,520.0	163,558,664.0	163,952,808.0	164,346,952.0	164,741,096.0	165,135,240.0	165,529,384.0	165,923,528.0	166,317,672.0	166,711,816.0	167,105,960.0	167,500,104.0	167,894,248.0	168,288,392.0	168,682,536.0	169,076,680.0	169,470,824.0	169,864,968.0	170,259,112.0	170,653,256.0	171,047,400.0	171,441,544.0	171,835,688.0	172,229,832.0	172,623,976.0	173,018,120.0	173,412,264.0	173,806,408.0	174,200,552.0	174,594,696.0	174,988,840.0	175,382,984.0	175,777,128.0	176,171,272.0	176,565,416.0	176,959,560.0	177,353,704.0	177,747,848.0	178,141,992.0	178,536,136.0	178,930,280.0	179,324,424.0	179,718,568.0	180,112,712.0	180,506,856.0	180,900,900.0	181,295,044.0	181,689,188.0	182,083,332.0	182,477,476.0	182,871,620.0	183,265,764.0	183,659,908.0	184,054,052.0	184,448,196.0	184,842,340.0	185,236,484.0	185,630,628.0	186,024,772.0	186,418,916.0	186,813,060.0	187,207,204.0	187,601,348.0	187,995,492.0	188,389,636.0	188,783,780.0	189,177,924.0	189,572,068.0	189,966,212.0	190,360,356.0	190,754,500.0	191,148,644.0	191,542,788.0	191,936,932.0	192,331,076.0	192,725,220.0	193,119,364.0	193,513,508.0	193,907,652.0	194,301,796.0	194,695,940.0	195,090,084.0	195,484,228.0	195,878,372.0	196,272,516.0	196,666,660.0	197,060,804.0	197,454,948.0	197,849,092.0	198,243,236.0	198,637,380.0	199,031,524.0	199,425,668.0	199,819,812.0	200,213,956.0	200,608,100.0	201,002,244.0	201,396,388.0	201,790,532.0	202,184,676.0	202,578,820.0	202,972,964.0	203,367,108.0	203,761,252.0	204,155,396.0	204,549,540.0	204,943,684.0	205,337,828.0	205,731,972.0	206,126,116.0	206,520,260.0	206,914,404.0	207,308,548.0	207,702,692.0	208,096,836.0	208,490,980.0	208,885,124.0	209,279,268.0	209,673,412.0	210,067,556.0	210,461,700.0	210,855,844.0	211,249,988.0	211,644,132.0	212,038,276.0	212,432,420.0	212,826,564.0	213,220,708.0	213,614,852.0	214,008,996.0	214,403,140.0	214,797,284.0	215,191,428.0	215,585,572.0	215,979,716.0	216,373,860.0	216,768,004.0	217,162,148.0	217,556,292.0	217,950,436.0	218,344,580.0	218,738,724.0	219,132,868.0	219,527,012.0	219,921,156.0	220,315,300.0	220,709,444.0	221,103,588.0	221,497,732.0	221,891,876.0	222,286,020.0	222,680,164.0	223,074,308.0	223,468,452.0	223,862,596.0	224,256,740.0	224,650,884.0	225,045,028.0	225,439,172.0	225,833,316.0	226,227,460.0	226,621,604.0	227,015,748.0	227,409,892.0	227,804,036.0	228,198,180.0	228,592,324.0	228,986,468.0	229,380,612.0	229,774,756.0	230,168,900.0	

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:	0.0	0.0	0.0	441.5	873.5	1,747.0	1,261.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	441.5	1,315.0	3,062.0	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8	4,323.8
Yr Total Cost:	0	0	0	20,664	43,293	91,719	70,775	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	20,664	63,957	155,676	226,451	226,451	226,451	226,451	226,451	226,451	226,451	226,451	226,451	226,451	226,451	226,451	226,451	226,451
GRAND TOTALS:																				
Yr Hours:	7,378.3	17,092.9	17,092.9	20,413.7	27,570.8	34,463.0	40,073.4	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1	40,701.1
Cum Hours:	7,378.3	24,471.2	24,471.2	44,884.9	72,455.6	106,918.6	146,992.0	187,693.1	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5	211,232.5
Yr Total Cost:	423,103	1,481,771	1,481,771	1,593,648	2,254,201	2,952,274	3,502,053	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741	3,395,741
Cum Total Cost:	423,103	1,904,873	1,904,873	3,498,521	5,752,722	8,704,997	12,207,050	15,602,791	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829	17,831,829

Robert Fellman

Joseph [Signature]

CAM CONTROL TEAM

Memorandum

HS 7-1

To:	Jeff Stone, MS52-4	Date:	May 17, 2001
Location:	Fernald	Reference:	N/A
From:	Ken Kepler, MS80-3	Fernald #:	M:OOTP(PC/EST):2001-0075
Location:	Springdale	Client:	DOE DE-AC24-01OH20115
Extension:	648-6767	Subject:	SILOS 1&2 CHEMICAL STABILIZATION (BASELINE)

c: File Record Subject ESTIMATE C4-2001-05-002
Dennis Nixon, MS52-4

Attached are two (2) copies for the SILOS 1&2 CHEMICAL STABILIZATION (BASELINE).

To request any additional copies of this estimate or for any questions, please contact Roger Johnson on extension 4140.

KGK:RLJ:hmp
Attachment

ESTIMATE REVIEW FORM

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
ESTIMATE NO.: C4.01.05.002
CLIENT: DOE
WBS NO.: 1.1.H.D

DATE: 16-May-01
ESTIMATOR: Johnson
LOCATION: FERNALD
TASK NO.: HSD12

Fluor Fernald, Inc.

COMPLETE ESTIMATE PACKAGE YES _____ NO _____

REQUIRED DOCUMENTS Equipment list, Plot plan, facility layouts. PFD's, P&ID's
Electric one-lines, and HVAC air flow drawings.

COMMENTS: The buildings are square footed, based on the new building drawings verses the
buildings that were estimated in the feasibility study done in 1999. These quantities are not actual take -
offs. The electrical power for each system was based on the number of motors associated with that system.
In the case of the CCTV cameras, the system was adjusted by the number of cameras. If there is no
electrical equipment number, then the power bulks were carried over from the feasibility study. The CCTV
cable and conduit was based on the number of cameras that changed from the feasibility study. Piping was
changed in so far as the cost of the process equipment changed. Instrumentation bulks cost changed as the cost of the process
equipment cost changed. The same is true for the painting and insulation costs. The site work was
minimally impacted and is basically the same as in the feasibility study. Time requirements did not permit a new bottoms-up estimate.
The comments from the project reviews can be review in the back-up and have
been incorporated into the estimate.

REVIEWERS SIGNATURE _____ DATE _____

RESOLUTION: _____

ESTIMATOR: _____ DATE _____

REVIEWER: _____ DATE _____

ESTIMATE REVIEW FORM

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline) ,
ESTIMATE NO.: C4-2001-05-002
CLIENT: DOE
WBS NO.: 1.1.H.D

DATE: 16-May-01
ESTIMATOR: Johnson
LOCATION: FERNALD
TASK NO.: HSD12

OTHER REVIEWS:

REQUESTER	_____	DATE	_____
CAM if > \$100,000	_____	DATE	_____
PROJ.MGR. if > \$ 1M	_____	DATE	_____
ESTIMATING SERVICES TEAM COACH		DATE	<u>5/16/01</u>

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Baseline

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input checked="" type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input checked="" type="checkbox"/>	Equipment List	<input checked="" type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input checked="" type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input checked="" type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4.01.05.002 is to provide a cost for the construction of the facilities, and systems for the processing of silos 1 and 2 radon producing material. The Chemical Stabilization Facility will be a steel and concrete structure. The warehouse and interim storage buildings will be tubular steel structures with fabric coverings. The electrical and control room buildings will be steel structures. The PPE will be housed in a trailer. The buildings are based on a square foot cost. The basis and comparison of these costs were the feasibility studies that were done on similar structures in 1999. (New SF /existing SF = %. This % was then multiplied against the known quantities to arrive at the new quantities. All costs were updated to 2001 dollars. All the new equipment costs that were supplied by the project were assumed to be in 2001 dollars. The bulk material factored from the equipment will also be in 2001 dollars the unit rates and productivity factor is the same as was used in the feasibility studies. The electrical bulks, for the equipment, were adjusted for each system as a function of the motor count for that system. Again, the feasibility study was used as the basis for the quantities. Health Physics equipment did not change from the feasibility study and the only requirement was to escalate the material to 2001 dollars. The site work was minimally impacted as roads, area covering, firewater, utilities, etc still must installed. The Analytical Lab is not part of this estimate and was removed. The cooling tower and

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Baseline

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

associated bulks was also removed. The emergency shower/eyewash stations have been retained from the feasibility study. Time requirements prohibited a new bottoms-up estimate. Mobilization/demobilization consists of subcontractor(s) bring on trailers, construction equipment, toolboxes and small tools. Unloading and spotting of the equipment is also included. Subcontractor submittles, to the site contractor, is also here. Project also added a 10 % cost to the equipment for a spare parts cost. Freight for equipment is 2.5 % of the equipment cost.

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
- Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Baseline

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

WASTE PROGRAM MANAGEMENT:

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- Waste Program Management dollars provided by the Project Engineer.

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

G & A (HO EXPENSE

This expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

HEALTH PHYSICS:

See attached APPENDIX "C".

RISK BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Baseline

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The supplied drawings were the primary source for the square foot areas of the buildings.
- Material pricing was from Mean's and a previous estimate
- Unit man-hours were from Mean's and a previous estimate.
- The equipment list was provided by the project.
- The feasibility study (1999) for a similar project was used for the SF facility costs , equipment electrical bulk installation and material costs,site costs and health physics costs
- Freight for equipment is at 2.5 % of equipment costs.
- All labor ,material and equipment costs are in 2001 dollars.
- Utilities to this facility will be from near by sources.
- Site work from the feasibility study is minimally impacted and is used in this estimate.
- A 10 % to the equipment costs is to cover spare costs.
- Electrical systems without an equipment no. were carried over from the feasibility study

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Baseline

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

EXCLUSIONS:

- Permits and fees.
- FD G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
- D & D costs for the new construction
- Cold and hot start-up costs.
- Any costs, to decontaminate material, prior to construction.
- Any testing costs other than normal construction testing.
- No breakdown by subcontractors installation costs, material costs and equipment costs was considered
- No burial costs, shipping costs or costs to procure boxes for shipping material off site.

ESTIMATE SUMMARY SHEET

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

Fluor Fernald, Inc.

ITEM NO.	ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
ITEM NO. 2	AAA - Mobilization	2,120		\$58,410				\$58,410
	000 - Civil & Excavation All Facilities	9,322		\$200,370		\$105,500		\$305,870
	100 - Concrete All Facilities	87,910		\$1,971,800		\$1,267,100		\$3,238,900
	200 - Structural Steel - All Facilities	14,734		\$347,300		\$926,400		\$1,273,700
	300 - Architectural/Buildings/Finishes- All Fac	28,118		\$636,100		\$1,346,200		\$1,982,300
	400 - Equipment Systems	14,873		\$392,570			\$7,042,200	\$7,434,770
	500 - Piping	14,935		\$394,300		\$502,800		\$897,200
	700 - Instrumentation	16,989		\$385,000		\$1,266,000	\$512,500	\$2,163,500
	600 - Electrical	61,837		\$1,118,310		\$706,700	\$771,400	\$2,596,410
	800 - Paint / Insulation	10,782		\$255,100		\$160,500		\$415,600
DIRECT FIELD COSTS TOTAL		261,718	\$22.01	\$5,759,300		\$6,281,300	\$8,326,100	\$20,366,700
	SUPERVISION - CONTRACTOR	57,576		\$1,267,000				\$1,267,000
	SMALL TOOLS & CONSUMABLES					\$480,700		\$480,700
	MISC. EQUIP. RENTAL						\$1,570,300	\$1,570,300
	TEMPORARY FACILITIES	7,852		\$172,800		\$172,800		\$345,600
	TEMPORARY UTILITY HOOK-UP	5,104		\$112,300		\$60,500		\$172,800
	JOB CLEAN-UP	11,777		\$259,200		\$86,400		\$345,600
	SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)							
	HEALTH PHYSICS S/C	4,608		\$101,400		\$600		\$102,000
	CERCLA - 40 HRS/FTE	5,475		\$120,500				\$120,500
	GET/SITE ACCESS & JOB SPECIFIC TRAINING	3,942		\$86,700				\$86,700
	PAYROLL BURDENS & BENEFITS	-	-	\$4,491,100				\$4,491,100
	OVERHEAD & PROFIT	-	-		\$5,865,800			\$5,865,800
	BOND	-	-		\$351,900			\$351,900
	SALES TAX	-	-			\$423,700	\$583,800	\$1,017,500
INDIRECT FIELD COSTS TOTAL		96,333		\$6,611,000	\$6,217,700	\$1,204,700	\$2,164,100	\$16,197,500
DIRECT & INDIRECT FIELD COSTS TOTAL: ITEM NO. 2		358,051	\$34.55	\$12,370,300	\$6,217,700	\$7,486,000	\$10,490,200	\$36,564,200
WASTE DISPOSITION MGMT. - F FERNALD								
OFF-SITE DISPOSAL COSTS (Commercial)								
WASTE MANAGEMENT COSTS TOTAL								
PROJECT MANAGEMENT - F FERNALD								
CONSTRUCTION MANAGEMENT - F FERNALD								
F FERNALD FIELD SUPPORT COSTS TOTAL: ITEM NO.3								
ENGINEERING/DESIGN/INSPECTION - F FERNALD								
ENGINEERING/DESIGN/INSPECTION - A/E								
ENGINEERING COSTS TOTAL - ITEM NO.4								
SALES TAX - F FERNALD								
SUB-TOTAL (BASE ESTIMATE)								\$36,564,200
RISK BUDGET								
TARGET ESTIMATE (FY 01 DOLLARS)								\$36,564,200
CONTINGENCY								
NTS BURIAL FEE								
ESTIMATE PERFORMED BY ESTIMATING SERVICES								

S:\ESTIMATE\Roger\2001 Silo estimates\Chemical Silo 1&2r\Chemical stabilization 2001

ESTIMATE SUMMARY SHEET

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FACTORS

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

FIXED PRICE SUBCONTRACT	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$5,759,300		\$6,281,300	\$8,326,100	\$600	\$20,367,300
IFC COST FACTOR	2.1479	--	1.1242	1.1886	--	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2049	1.2049	1.2049	1.2049	1.2049	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	2.5880	1.2049	1.4359	1.5181	1.2772	
BASE ESTIMATE \$'s	\$14,904,853		\$9,019,087	\$12,639,520	\$766	\$36,564,227
RISK BUDGET FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	2.5880	1.2049	1.4359	1.5181	1.2772	
FPS TARGET ESTIMATE (FY01 DOLLARS)	\$14,904,853		\$9,019,087	\$12,639,520	\$766	\$36,564,227

NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe. SEE De-Escalated Summary.
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G59.
- 3.) If F Fernald Support dollars appear below, and were generated as a percentage of the DFC, Risk Budget would apply and these dollars would be de-escalated to FY96. Indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the NO box.
 If the FF Support costs are supported by LOE estimates, use those estimates for input to microframe, enter 'SPACE BAR' in the Yes Box and an X in the No Box.

DOES RISK BUDGET APPLY TO F FERNALD SUPPORT COSTS		YES	NO				
		X					
F FERNALD SUPPORT COSTS		LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
F FERNALD PROJECT MGMT.							
RISK BUDGET FACTOR		1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM							
F FERNALD CONSTRUCTION MGMT.							
RISK BUDGET FACTOR		1.00	1.00	1.00	1.00	1.00	1.00
TOTAL CM							
F FERNALD WASTE PROGRAM MGMT.							
RISK BUDGET FACTOR		1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM							
F FERNALD RSO							
RISK BUDGET FACTOR		1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO							
F FERNALD ENGINEERING/DESIGN/INSPECTION							
RISK BUDGET FACTOR		1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.							
A/E ENGINEERING/DESIGN/INSPECTION							
RISK BUDGET FACTOR		1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E							
SUB-TOTAL PROJECT TARGET EST. (FY01 DOLLARS)							\$36,564,227

If FF Support Costs were based on % defaults, indicate 'Yes' above. These costs are considered FY01 \$'s and Risk Budget applies.

If FF Support Costs were based on LOE estimates provided by the CAM's, indicate 'NO' and escalate the LOE dollars to FY01. Risk Budget will NOT apply. Separate the Sales Tax below.

The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

OTHER F FERNALD SALES TAX - 6%							
RISK BUDGET FACTOR		1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER F FERNALD SALES TAX							
TOTAL PROJECT TARGET EST. (FY01 DOLLARS)							\$36,564,227

ESTIMATE SUMMARY SHEET

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

**Direct Field Cost
w/FACTORS**

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

PAY ITEM NO.	DESCRIPTION	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
ITEM NO. 2	AAA - Mobilization	58410 \$151,160				600 600 \$770	59010 \$151,930
	000 - Civil & Excavation All Facilities	200370 \$518,550		105500 \$151,480			305870 \$670,030
	100 - Concrete All Facilities	1971800 \$5,102,940		1267100 \$1,819,380			\$6,922,320
	200 - Structural Steel - All Facilities	347300 \$898,800		926400 \$1,330,180			\$2,228,980
	300 - Architectural/Buildings/Finishes-All F	636100 \$1,646,200		1346200 \$1,932,960			\$3,579,160
	400 - Equipment Systems	392570 \$1,015,960			7042200 \$10,690,480		\$11,706,440
	500 - Piping	394300 \$1,020,430		502900 \$722,100			\$1,742,530
	700 - Instrumentation	385000 \$996,370		1266000 \$1,817,800	512500 \$778,010		\$3,592,180
	600 - Electrical	1118310 \$2,894,140		706700 \$1,014,720	771400 \$1,171,030		\$5,079,890
	800 - Paint / Insulation	255100 \$660,190		160500 \$230,460			\$890,650

TOTAL DIRECT FIELD COSTS w/FACTORS (FY01 DOLLARS) \$36,564,110

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	SUMMARY CAPITAL NO. 2	QTY	UNIT	MAN-HOURS			COST / UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l					
AAA - Mobilization					2,120								\$58,410	
000 - Civil & Excavation All Facilities					9,322						\$105,500		\$200,370	
100 - Concrete All Facilities					87,910						\$1,287,100		\$1,871,800	
200 - Structural Steel - All Facilities					14,734						\$928,400		\$347,300	
300 - Architectural/Buildings/Finishes-All Fac					28,116						\$1,348,200		\$838,100	
400 - Equipment Systems					14,873							\$7,042,200	\$392,570	
500 - Piping					14,935						\$502,800		\$394,300	
700 - Instrumentation					16,989						\$1,288,000		\$385,000	
800 - Electrical					61,937						\$708,700		\$1,118,310	
800 - Paint / Insulation					10,782						\$180,500		\$255,100	
Subtotal Direct Cost											\$5,759,260	\$8,281,300	\$8,328,100	\$20,668,660

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

Fluor Fernald, Inc.

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labo	SIC	Mat'l					
000 - Civil & Excavation All Facilities													
Civil & Excavation All Facilities													
D. Excavation of all buildings													
D	18152	CY	0.11	2106	21.49			\$45,260				\$45,260	
D	13034	CY	0.15	2318	21.49			\$49,810				\$49,810	
D	81240	SF	0.01	771	21.49			\$16,570				\$16,570	
D	5471	CY	0.08	519	21.49			\$11,150				\$11,150	
D	90	LF	0.25	27	21.49	18.33		\$580		\$1,900		\$2,480	
D	3	EA	4.00	14	21.49	100.00		\$300		\$330		\$630	
D	4	EA	48.00	228	21.49	650		\$4,900		\$2,840		\$7,740	
D	4	EA	5.00	24	21.49	210		\$520		\$920		\$1,440	
D	335	CY	0.75	288	21.49	12		\$6,400		\$4,400		\$10,800	
D	42	EA	0.75	37	21.49	66		\$800		\$3,030		\$3,830	
E. SITE WORK													
D	18584	SY	0.029	673	21.49			\$14,460				\$14,460	
D	2987	SY	0.038	135	21.49			\$2,900				\$2,900	
D	2987	SY	0.017	60	21.49	2.4		\$1,290		\$7,840		\$9,130	
D	2340	SY	0.025	89	21.49	8.16		\$1,480		\$20,890		\$22,370	
D	847	SY	0.020	15	21.49			\$320				\$320	
D	7084	SY	0.012	101	21.49			\$2,170				\$2,170	
D	7084	SY	0.017	142	21.49	2.4		\$3,050		\$18,550		\$21,600	
D	200	hrs	1.00	237	21.49			\$5,090				\$5,090	
D	1500	lf	0.05	89	21.49	0.62		\$1,910		\$1,020		\$2,930	
Take-off Allowance													
Subtotal Direct Cost													\$169,000
													\$61,700
													\$230,700

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DDE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	100 - Concrete All Facilities	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MATL	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
CONCRETE														
D	1. Install slab on grade	2441	CY	3.70	10707	22.43			85.40		\$228,030		\$468,190	
D	2. Install walls	2051	CY	12.20	29671	22.43			176.00		\$394,970		\$1,060,480	
D	3. Install structural footings	527	CY	6.70	4189	22.43			109.70		\$63,290		\$157,250	
D	4. Install continuous footings	611	CY	5.10	3696	22.43			113.40		\$75,830		\$158,730	
D	5. Install equipment foundations	245	CY	8.20	2384	22.43			105.60		\$28,320		\$81,790	
D	6. Grouting	315	CF	1.00	373	22.43			3.25		\$1,120		\$9,490	
D	7. Tilt-up walls	34273	SF	0.24	9752	22.43			3.61		\$135,350		\$354,090	
D	8. Install elevated slab	1147	CY	12.50	17000	22.43			181.50		\$227,760		\$609,070	
D	9. Install columns for modular walls	444	CY	18.70	9840	22.43			224.80		\$109,150		\$329,860	
D	10. Install stack base	2	CY	8.20	19	22.43			105.60		\$230		\$680	
D	11. Install duct footings	6	CY	8.20	58	22.43			105.60		\$690		\$1,990	
D	12. Install guy anchors	8	CY	8.20	78	22.43			105.60		\$920		\$2,670	
D	13. Fabricate cover block		EA			22.43								
D	14. Erect cover block		EA			22.43								
D	15. Stack structural footing	4	CY	6.70	32	22.43			109.70		\$480		\$1,200	
D	16. Embedded bolts for box beam	144	EA	0.650	111	22.43			5.95		\$920		\$3,410	
Take-off Allowance														
Subtotal Direct Cost										1,971,800	1,287,100		\$3,258,900	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	200 - Structural Steel - All Facilities	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
2														
	<u>Structural Steel</u>													
D	1. Install metal roofing	28186	SF	0.008	248	23.57					\$20,630		\$26,480	
D	2. Install light steel	188	TON	25.00	4912	23.57			\$115,760		\$317,300		\$433,060	
D	3. Install medium steel	89	TON	22.00	2579	23.57			\$60,790		\$163,330		\$224,120	
D	4. Install heavy steel	113	TON	19.00	2544	23.57			\$59,960		\$165,560		\$225,520	
D	5. Install stack structure	4.4	TON	22	117	23.57			\$2,760		\$7,410		\$10,170	
D	6. Install checkered plate	4305	SF	0.11	561	23.57			\$13,220		\$27,880		\$41,100	
D	7. Install ladders	392	LF	0.64	298	23.57			\$7,020		\$24,260		\$31,280	
D	8. Install stairs	318	RISER	2.31	884	23.57			\$20,360		\$30,220		\$50,580	
D	9. Install handrails	688	LF	0.13	103	23.57			\$2,430		\$10,270		\$12,700	
D	10. Install pre-engineered structure	8900	SF	0.05	587	23.57			\$13,840		\$58,100		\$69,940	
D	11 Crane rails	3.95	TON	12.00	56	23.57			\$1,320		\$3,800		\$5,120	
D	12. Install crane rail box beam	9	TON	17.30	186	23.57			\$4,380		\$18,440		\$20,820	
D	13. Install support for box beam	28	EA	15.00	462	23.57			\$10,890		\$19,910		\$30,800	
D	14. Install crane rail stops	4	PR	4.00	19	23.57			\$450		\$1,970		\$2,420	
D	15. Install 2-1/2" x 2-1/2" x 1/4" angle iron	120	LF	0.34	48	23.57			\$1,130		\$480		\$1,610	
D	16. Install eumps	14	EA	26.00	432	23.57			\$10,180		\$24,350		\$34,530	
D	17. Install grading	2083	SF	0.15	372	23.57			\$8,770		\$19,230		\$28,000	
D	19. Install davit	4	EA	5.00	24	23.57			\$570		\$3,060		\$3,630	
D	20. Install kickplate	305	LF	0.05	18	23.57			\$420		\$1,200		\$1,620	
D	21. Install duct support	8	EA	10.00	71	23.57			\$1,870		\$4,310		\$5,980	
D	22. Install duct to stack	150	LF	1.11	197	23.57			\$4,640		\$8,830		\$11,470	
D	. Guy cable	800	LF	0.04	36	23.57			\$850		\$1,890		\$2,740	
Take-off Allowance														
Subtotal Direct Cost										347,300		826,400		\$1,273,700

DETAIL ESTIMATE WORKSHEETS

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

Fluor Fernald, Inc.

ITEM NO.	300 - Architectural/Buildings/Finishes-All Fac	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MATT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labo	S/C	Mat'l					
ARCHITECTURAL														
0	1. Install metal stud w/gyp. board	8687	SF	0.051	525	22.89					1.02		\$8,890	\$21,800
0	2. Install vents and drains	45651	SF	0.005	271	22.89					0.35		\$17,480	\$23,850
0	3. Install cleaning agent	1	LOT	25.0	30	22.89					10700		\$11,710	\$12,390
0	4. Install siding	51389	SF	0.041	2497	22.89					0.86		\$48,330	\$104,990
0	5. Install roof insulation	28116	SF	0.007	217	22.89					0.44		\$12,570	\$17,490
0	6. Install wall insulation	25889	SF	0.005	152	22.89					0.35		\$9,840	\$13,290
0	7. Install membrane roofing	28116	SF	0.025	774	22.89					1.31		\$37,430	\$54,980
0	8. Install 1/2" fiber board	28116	SF	0.009	279	22.89					0.20		\$5,710	\$12,040
0	9. Install single exterior door 3x7	19	EA	8.00	180	22.89					880.00		\$14,130	\$18,210
0	10. Install double ext. door 6x7	3	EA	14.00	50	22.89					970.00		\$3,180	\$4,310
0	11. Install roll-up door 14' x 14'	7	EA	15.00	124	22.89					14000		\$107,210	\$119,020
0	12. Install single int. door 3x7	14	EA	6.00	100	22.89					280.00		\$4,290	\$6,560
0	13. Install double int. door 6x7	8	EA	12.00	118	22.89					510.00		\$4,810	\$7,290
0	14. Install roof closure	486	LF	0.14	81	22.89					13.15		\$6,890	\$8,830
0	15. Install bldg. communications	74559	SF	0.03	2852	22.89					9.57		\$43,230	\$103,400
0	16. Install coated poly. bldg. cover	34850	SF	0.104	4284	22.89					9.07		\$97,200	\$441,020
0	17. Install tank shelter	1	EA	340.0	403	22.89					14100		\$15,430	\$24,570
0	18. Block and level trailers	1	EA	50.0	59	22.89					125000		\$136,750	\$138,090
0	20 Seal ext. walls, roof & floor	194	LF	0.3	58	22.89					3.50		\$740	\$2,060
0	21 Fab abd install stairs & ramps	1	LOT	150	178	22.89					66274		\$72,500	\$76,540
0	22 Ceiling	100	SF	0.027	3	22.89					0.80		\$90	\$160
0	Staires to trailers	10	EA	15.000	178	22.89					150.00		\$1,200	\$5,000
0	Trailer Skirting	10600	SF	0.02	251	22.89					1.2		\$7,660	\$11,740
0	1. install building sprinklers	73119	SF	0.0551	4776	22.89					1.61		\$129,080	\$237,450
0	1. Install double int. door 10x8	3	EA	22.00	78	22.89					975		\$3,200	\$4,970
C.H.V.A.C.														
0	1. install ductwork galv. stl.	78016	LBS	0.06	5272	22.89					2.14		\$182,650	\$302,270
0	2. install dampers	1	LOT	682	809	22.89					27157		\$28,710	\$48,070
0	3. install accessories	1	LOT	320	379	22.89					12758		\$13,960	\$22,560
0	4. install supports	1	LOT	909	1078	22.89					36147		\$39,540	\$64,000
0	5. install insulation	1	LOT	789	912	22.89					30556		\$20,690	\$54,120
0	6. Test and Balance	1	LOT	1137	1348	22.89							\$30,590	\$30,590
Take-off Allowance														
Subtotal Direct Cost														
										636,100			1,346,200	\$1,982,300

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	400 - Equipment Systems	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
0	Equip. No.13 Description	8	EA	24.0	171	26.40			3500			\$21,000	\$25,510	
0	13-PM-001 A, B, C, D, E, F Transfer Pump	6	EA	54.0	384	26.40			39000			\$234,000	\$244,140	
0	13-TK-001 A,B,C Slurry Receipt Tank	3	EA	550.0	1956	26.40			250000			\$750,000	\$801,840	
0	13-EJ-001,002,003 Slurry Jet Ejector	21	EA	8.0	199	26.40			1200			\$25,200	\$30,450	
0	Equip. No.15 Description	2	EA	24.0	57	26.40			3200			\$6,400	\$7,900	
0	15-PM-001 A&B Lime Slurry Addition Pump	2	EA	24.0	57	26.40			5200			\$10,400	\$11,900	
0	15-PM-002 A&B Phosphate Addition Pump	2	EA	24.0	57	26.40			2700			\$5,400	\$6,900	
0	15-PM-004 A&B Alum Addition Pump	2	EA	24.0	57	26.40			3200			\$6,400	\$7,900	
0	15-PM-005 A&B Clairfier Underflow Pump	2	EA	24.0	57	26.40			2300			\$4,600	\$6,100	
0	15-PM-005 C&D pH Recirculation Pump	2	EA	24.0	57	26.40			2500			\$3,000	\$4,500	
0	15-PM-006 A&B Clairfier Overflow Pump	2	EA	24.0	57	26.40			3000			\$3,000	\$4,500	
0	15-MX-001B Lime Slurry Feed Tank Mixer	1	EA	28.0	33	26.40			7500			\$7,500	\$8,370	
0	15-MX-002A & B Phosphate Prep Tank Mixer	2	EA	24.0	28	26.40			3300			\$3,300	\$4,040	
0	15-MX-005A Flocculator Mixer	1	EA	48.0	57	26.40			77000			\$77,000	\$78,500	
0	15-MX-008 Clairfier Mixer	1	EA	22.0	28	26.40			7500			\$7,500	\$8,180	
0	15-PP-001 Polyelectrolyte Package	1	EA	12.0	14	26.40			2000			\$2,000	\$2,370	
0	15-TK-001A Lime Bag Breaker/Feeder	1	EA	20.0	24	26.40			9000			\$9,000	\$9,630	
0	15-TK-002 A&B Phosphate Preparation Tank	2	EA	15.0	36	26.40			7800			\$15,200	\$16,150	
0	15-TK005A flocculator	1	EA	25.0	70	26.40			10500			\$10,500	\$12,350	
0	15-TK-005B Polyelectrolyte Addition Tank	1	EA	12.0	14	26.40			3000			\$3,000	\$3,370	
0	15-TK-006 Clairfier	1	EA	550.0	852	26.40			74000			\$74,000	\$81,210	
0	15-TK-007 Clairfier Overflow Tank	1	EA	20.0	24	26.40			5700			\$5,700	\$6,330	
0	Equip. No.16 Description	6	EA	24.0	171	26.40			5400			\$32,400	\$36,910	
0	16-PM-001A,B,C,D,E,F Slurry Feed Pump	3	EA	60.0	213	26.40			28000			\$84,000	\$89,620	
0	16-MX-001 A,B,C Slurry Feed Tank Mixer	3	EA	50.0	178	26.40			42000			\$126,000	\$130,700	
0	Equip. No.17 Description	1	EA	24.0	28	26.40			5000			\$5,000	\$5,740	
0	17-PM-001 Waste Water Pump	1	EA	24.0	28	26.40			5000			\$5,000	\$5,740	
0	17-PM-002 Mixer Room Sump Pump	1	EA	18.0	21	26.40			6200			\$6,200	\$6,750	
0	17-CN-001 Waste Water Container	3	EA	150.0	534	26.40			25000			\$75,000	\$89,100	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	400 - Equipment Systems	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MATL	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
D	17-MX-001 A,B,C Product Mixer Equip. No.19 Description	3	EA	72.0	268	28.40			\$6,780			\$840,000	\$846,780	
D	19-PM-001 Mixer Dust Collector	1	EA	30.0	36	28.40			\$950			\$20,000	\$20,950	
D	19-BL-001 Dust Collector Blower Equip. No.25 Description	1	EA	10.0	12	26.40			\$320			\$8,000	\$8,320	
D	25-CY-001 Empty Container/Lid Removal Conv.	1	EA	65.0	77	28.40			\$2,030			\$45,700	\$47,730	
D	25-CY-002 A,B,C Fill Conveyor	3	EA	40.0	142	28.40			\$3,750			\$32,700	\$36,450	
D	25-CY-003 A,B,C Sample Conveyor	3	EA	40.0	142	28.40			\$3,750			\$34,200	\$37,950	
D	25-CY-004 A,B,C Head Install/Fastening Conv.	3	EA	40.0	142	28.40			\$3,750			\$35,100	\$38,850	
D	25-CY-005 Survey/Decon Station Conveyor	1	EA	60.0	71	28.40			\$1,870			\$32,000	\$33,870	
D	25-CY-006 Filled Container A/L Conveyor + B21	1	EA	40.0	47	28.40			\$1,240			\$9,100	\$10,340	
D	25-CY-007 Filled Container Staging Conv. Equip. No.40 Description	1	EA	85.0	101	28.40			\$2,870			\$62,700	\$65,570	
D	40-ME-001 A&B Plant Air Compressor	2	EA	100.0	237	28.40			\$6,280			\$47,000	\$53,280	
D	40-ME-002 A Instrument Air Compressor	1	EA	40.0	47	28.40			\$1,240			\$11,500	\$12,740	
D	40-ME-001 Plant Air Compressor Dryer	1	EA	25.0	30	28.40			\$790			\$9,500	\$10,290	
D	40-rn-002 Instrument Air Compressor Dryer	1	EA	20.0	24	28.40			\$630			\$4,500	\$5,130	
D	40-ME-003 Plant Air Receiver	1	EA	40.0	47	28.40			\$1,240			\$4,400	\$5,640	
D	40-ME-006 Instrument Air Receiver	1	EA	25.0	30	28.40			\$790			\$2,300	\$3,090	
D	41-ME-001 A&B Breathing Air Compressor Equip. No.41 Description	2	EA	65.0	154	28.40			\$4,070			\$33,000	\$37,070	
D	41-ME-002 Breathing Air Dryer	1	EA	25.0	30	28.40			\$790			\$11,500	\$12,290	
D	41-ME-003 Breathing Air Purifier	1	EA	8.0	9	28.40			\$240			\$1,500	\$1,740	
D	41-ME-004 A&B Breathing Air Receiver	2	EA	10.0	24	28.40			\$630			\$3,800	\$4,230	
D	44-BN-001 Cement storage bin Equip. No.44 Description	1	EA	160.0	180	28.40			\$5,020			\$80,000	\$85,020	
D	44-BN-002 A&B Fly Ash Bin	2	EA	160.0	379	28.40			\$10,010			\$120,000	\$130,010	
D	44-CV-001 Cement Conveyor	1	EA	40.0	47	28.40			\$1,240			\$15,000	\$16,240	
D	44-CV-002 Fly Ash Conveyor	1	EA	40.0	47	28.40			\$1,240			\$15,000	\$16,240	
D	55-PM-001 A&B Slicing Pump Equip. No.55 Description	2	EA	32.0	76	28.40			\$2,010			\$19,000	\$21,010	
D	55-TK-001 Clarifier Tank	1	EA	550.0	652	28.40			\$17,210			\$250,000	\$267,210	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	400 - Equipment Systems	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Equip	Mat'l	SIC					
2	Equip. No.82 Description													
D	62-PM-001 Liquid Waste Pump	1	EA	24.0	28	28.40	2800		\$740			\$2,800	\$3,540	
D	62-TK-001 Liquid Waste Tank	1	EA	550.0	652	28.40	250000		\$17,210			\$250,000	\$267,210	
D	Equip. No.73 Description													
D	73-AH-001 Zones 1&2 Air Handling Unit	1	EA	150.0	178	26.40	80000		\$4,700			\$80,000	\$84,700	
D	73-AH-002 Con Storage Bldg AHU	1	EA	45.0	53	26.40	16000		\$1,400			\$16,000	\$17,400	
D	73-AH-003A & B Zones 2&3 Air Handling Unit	2	EA	150.0	356	26.40	80000		\$9,400			\$160,000	\$169,400	
D	73-AH-004 Monitoring Room Air Handling	1	EA	20.0	24	26.40	700		\$630			\$700	\$1,330	
D	73-AH-005 Cold Chem Make up Room	1	EA	20.0	24	26.40	700		\$630			\$700	\$1,330	
D	73-FA-001 A&B Zone 1 Filter Exhaust Fan	2	EA	40.0	95	26.40	10000		\$2,510			\$20,000	\$22,510	
D	73-FA-002 Con Sto Bldg Esh Fan	1	EA	45.0	53	26.40	13000		\$1,400			\$13,000	\$14,400	
D	73-FA-003 A&B Zones 2&3 Exhaust Fan	2	EA	50.0	119	26.40	15000		\$3,140			\$30,000	\$33,140	
D	73-FL-001 A&B Clean Area Filter Housing	2	EA	150.0	356	26.40	80000		\$9,400			\$160,000	\$169,400	
D	73-FL-003 A,B,C Contaminated Area Filter Hdg	3	EA	150.0	534	26.40	80000		\$14,100			\$240,000	\$254,100	
D	73-HE-002 Liquid Pretreat. Corridor	1	EA	35.0	41	26.40	8000		\$1,080			\$8,000	\$9,080	
D	73-HE-003 Access Control Room Heater	1	EA	10.0	12	26.40	800		\$320			\$800	\$1,120	
D	73-HE-004 Con Sto Bldg Heater	1	EA	30.0	36	26.40	9000		\$950			\$9,000	\$9,950	
D	73-HE-005 Survey & Decon Test Rm Heater	1	EA	10.0	12	26.40	500		\$320			\$500	\$820	
D	73-HE-006 Monitor room Heater	1	EA	10.0	12	26.40	800		\$320			\$800	\$1,120	
D	73-HE-007 Product Mixing Rm Corr Heater	1	EA	30.0	36	26.40	5600		\$950			\$5,600	\$6,550	
D	73-HE-008 Cold Chem Make up Rm Heater	1	EA	20.0	24	26.40	3200		\$630			\$3,200	\$3,830	
D	73-ST-001 HVAC Stack	1	EA	150.0	178	26.40	150000		\$4,700			\$150,000	\$154,700	
D	Equip. No.82 Description													
D	82-CN-001 Monorail Hoist 1 Ton	1	EA	16.0	19	26.40	4000		\$500			\$4,000	\$4,500	
D	82-CN-002 A,B,C Monorail Hoist,2 Ton	3	EA	20.0	71	26.40	4000		\$1,870			\$12,000	\$13,870	
D	82-CN-003 A,B,C Monorail Hoist,1 Ton	3	EA	16.0	57	26.40	4000		\$1,500			\$12,000	\$13,500	
D	82-CN-004 Bridge Crane,20 Ton	1	EA	220.0	261	26.40	298000		\$6,890			\$298,000	\$304,890	
D	82-ME-001 Head Grapple,Interim con Staging	1	EA	10.0	12	26.40	15000		\$320			\$15,000	\$15,320	
D	82-ME-003 A,B,C Container Fill Head	3	EA	30.0	107	26.40	50000		\$2,820			\$150,000	\$152,820	
D	82-ME-004 A,B,C Transfer Drawer for Conta	3	EA	40.0	142	26.40	23000		\$3,750			\$69,000	\$72,750	
D	82-ME-005 A,B,C Additive Head for Adsorbent	3	EA	25.0	89	26.40	40000		\$2,350			\$120,000	\$122,350	
D	82-ME-006 A,B,C Head Grapple @ Cont Head	3	EA	20.0	71	26.40	15000		\$1,870			\$45,000	\$46,870	
D	82-ME-007 A,B,C Head Fastener @ Cont	3	EA	50.0	178	26.40	50000		\$4,700			\$150,000	\$154,700	
D	82-ME-008 A,B,C Container Smear equip	3	EA	50.0	178	26.40	50000		\$4,700			\$150,000	\$154,700	
D	82-ME-009 A&B Bar Code Installer	3	EA	30.0	107	26.40	15000		\$2,820			\$45,000	\$47,820	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	400 - Equipment Systems	QTY	UNIT	MAN-HOURS		COST/UNIT				LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
D	82-ME-010 A,B & C Bar Code Scanner	3	EA	25.0	89	26.40				\$2,350			\$30,000	\$32,350
D	82-ME-011 Reach Tools Equip. No.83	1	EA	30.0	36	26.40				\$950			\$7,500	\$8,450
D	83-ME-001 A,B,C Shield Windows	3	EA	120.0	427	26.40				\$11,270			\$180,000	\$191,270
D	83-ME-002 A-F Shield Doors Equip. No.84	6	EA	75.0	534	26.40				\$14,100			\$120,000	\$134,100
D	84-ME-001 A,B,C Sampler for Filled Containers Equip. No.85	3	EA	25.0	89	26.40				\$2,350			\$30,000	\$32,350
D	85-ME-001 A,B,C Camera for Container Fill	3	EA	20.0	71	26.40				\$1,870			\$15,000	\$16,870
D	85-ME-002 A,B,C,D,E,F CCTV	6	EA	12.0	85	26.40				\$2,240			\$9,000	\$11,240
D	85-ME-003 A,B,C,D,E,f CCTV	6	EA	12.0	85	26.40				\$2,240			\$9,000	\$11,240
D	85-ME-004 A,B,C,D,E,F CCTV	6	EA	12.0	85	26.40				\$2,240			\$9,000	\$11,240
D	85-ME-005 A,B,C CCTV	3	EA	12.0	43	26.40				\$1,140			\$4,500	\$5,640
D	85- - Final Weight Scale	3	EA	25.0	89	26.40				\$2,350			\$22,500	\$24,850
D	85- - Absorbent Bag Unloader	1	EA	40.0	47	26.40				\$1,240			\$27,000	\$28,240
D	85- - Absorbent Screw Conveyor	1	EA	25.0	30	26.40				\$790			\$2,500	\$3,290
D	85- - Fill Station Scale&Vibrate	3	EA	100.0	356	26.40				\$9,400			\$180,000	\$189,400
D	85-ME-008 Camera Controls & Monitoring	1	LOT	250.0	296	26.40				\$7,810			\$22,800	\$30,610
Critical Spare parts @ 10 % of Equip. Costs														
D	Emergency Shower/Eyewash Stations	5	EA	10.0	59	26.40				\$1,560			\$5,470	\$7,030
Freight@ 2.5 %														
											\$392,570	\$7,042,222	\$7,434,792	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	500 - Piping	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Mat'l	Equip					
0	1. Install 1/2" c.s. gate valve	155	EA	1.2	221	26.40	61.5	\$5,630		\$10,430		\$16,260	
0	2. Install 3/4" c.s. gate valve	28	EA	1.3	43	26.40	68.75	\$1,140		\$2,140		\$3,280	
0	3. Install 2" c.s. gate valve	28	EA	1.7	56	26.40	207.75	\$1,480		\$6,360		\$7,840	
0	4. Install 1/2" s.s. gate valve	44	EA	1.3	68	26.40	257.25	\$1,800		\$12,380		\$14,180	
0	5. Install 3/4" s.s. gate valve	10	EA	1.4	17	26.40	316.05	\$450		\$3,460		\$3,910	
0	6. Install 2" s.s. gate valve	10	EA	1.9	23	26.40	717.15	\$610		\$7,850		\$8,460	
0	7. Install 1-1/2" s.s. check valve	6	EA	1.8	13	26.40	464.31	\$340		\$3,050		\$3,390	
0	8. Install 3" s.s. check valve	4	EA	4.1	19	26.40	1104.95	\$500		\$4,840		\$5,340	
0	Relocate existing 30" drain line	150	LF	1.3	231	26.40		\$6,100				\$6,100	
0	2. Install new (HDPE) drain line	300	LF	0.825	293	26.40	67.51	\$7,740		\$22,160		\$29,900	
0	11. Install bin loading lines	325	LF	0.53	204	26.40	13.45	\$5,390		\$4,780		\$10,170	
0	2. Install double cont. pipe	2100	LF	0.7	1728	26.40	14.72	\$45,620		\$33,820		\$79,440	
0	3. Install piping including valves bulk	1	LOT	8551	10138	26.40	225780	\$267,840		\$247,000		\$514,840	
0	<u>Firewater</u>												
0	1. Install 4" post indicator valves	1	EA	6.50	8	26.40	5200.00	\$210		\$5,690		\$5,900	
0	2. Install 12" std. wt cs pipe	1240	LF	0.59	863	26.40	42.65	\$22,780		\$57,860		\$80,640	
0	3. Install 8" std. wt cs pipe	650	LF	0.41	313	26.40	25.71	\$8,260		\$18,280		\$26,540	
0	4. Install 4" std. wt cs pipe	1100	LF	0.24	306	26.40	10.92	\$8,080		\$13,140		\$21,220	
0	5. Install hydrants	21	EA	4.00	100	26.40	700.00	\$2,640		\$16,080		\$18,720	
0	6. Install 4" gate valves	21	EA	4.00	100	26.40	850.00	\$2,640		\$19,530		\$22,170	
0	7. Install valve boxes	21	EA	6.00	148	26.40	325.00	\$3,930		\$7,470		\$11,400	
0	8. Install 4" post indicator valves	3	EA	8.00	28	26.40	1100.00	\$740		\$3,610		\$4,350	
0	9. Install 8" post indicator valves	1	EA	12.00	14	26.40	2750.00	\$370		\$3,010		\$3,380	
Take-off Allowance													
Subtotal Direct Cost												\$697,200	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DDE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	700 - Instrumentation	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MATT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Met'l					
0	SYSTEM_13	1	LOT	5605.0	6645	22.66		235895	\$150,580		\$235,900		\$386,480	
0	SYSTEM_15	1	LOT	1084.0	1285	22.66		45614	\$29,120		\$45,610		\$74,730	
0	SYSTEM_16	1	LOT	1842.0	2184	22.66		77532	\$49,490		\$77,530		\$127,020	
0	SYSTEM_17	1	LOT	76.0	90	22.66		3208	\$2,040		\$3,210		\$5,250	
0	SYSTEM_19	1	LOT	127.0	151	22.66		5346	\$3,420		\$5,350		\$8,770	
0	SYSTEM_40	1	LOT	687.0	815	22.66		26893	\$18,470		\$28,890		\$47,360	
0	SYSTEM_55	1	LOT	1422.0	1686	22.66		59833	\$38,200		\$59,830		\$98,030	
0	SYSTEM_62	1	LOT	1382.0	1615	22.66		57330	\$38,600		\$57,330		\$93,930	
0	Install HVAC controls	24	EA	8.0	228	22.66		940	\$5,170		\$24,680		\$29,850	
0	DCS	1	LOT	600.0	711	22.66		30000	\$16,110		\$500,000	Inc'l Above	\$516,110	
0	1. Install fire alarm & evacuation sys.	1	LOT	150.0	178	22.66		30000	\$4,030		\$32,820		\$36,850	
0	Health_Physics	1	EA	18.0	21	22.66		27000	\$480		\$28,540		\$30,020	
0	3. Install auto radio counter	2	EA	24.0	57	22.66		35725	\$1,290		\$78,170		\$79,460	
0	4. Install radonn wkg. level monitor	8	EA	12.0	114	22.66		11000	\$2,580		\$96,270		\$98,850	
0	5. Install body frisker	3	EA	20.0	71	22.66		41950	\$1,610		\$137,680		\$139,290	
0	6. Install air sampling station (CAM)	12	EA	4.0	57	22.66		1900	\$1,290		\$24,940		\$26,230	
0	7. Install tool contamination monitor	2	EA	20.0	47	22.66		19000	\$1,070		\$41,570		\$42,640	
0	8. Install iokinetic air sampler	2	EA	60.0	142	22.66		30000	\$3,220		\$85,640		\$88,860	
0	1. Install leak detection	14	EA	21.5	357	22.66		901.5	\$8,090		\$13,810		\$21,900	
0	2. Install iokinetic monitor	1	EA	60.0	71	22.66		150000	\$1,610		\$164,100		\$165,710	
0	3. Install instruments and bulk mat'l	1	LOT	355.0	421	22.66		5358	\$9,540		\$5,360		\$14,900	
0	Install Pressure rad monitor	8	ea	4.0	43	22.66		4200	\$970		\$37,800	\$12,500	\$38,770	
Freight @ 2.5%														
Take-off Allowance														
Subtotal Direct Cost													\$2,163,500	
										\$385,000	\$12,500	\$2,163,500		

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Equip	Mat'l	Equip					
0	3. LTG. CONT'L RM	1944	SF	0.20	461	22.66	4.30		\$10,450		\$9,140		\$19,590	
0	4. LTG-Waste process, E. bldg, whse, etc	52427	SF	0.05	3108	22.66	1.08		\$70,430		\$61,940		\$132,370	
0	5. Install lighting to On-Site Storage bldg.	24750	SF	0.08	2201	22.66	1.62		\$49,870		\$43,880		\$93,750	
0	7. Install elect bulk non-process. instruments	1	LOT	45	53	22.66	637		\$1,200		\$700		\$1,900	
<u>Equipment NO. 13</u>														
0	Motor flex conduit conn. to 10 HP	6	EA	12.90	92	22.66	181.00		\$2,080		\$1,190		\$3,270	
0	Motor flex conduit conn. to 20 HP	6	EA	13.20	94	22.66	184.00		\$2,130		\$1,080		\$3,210	
0	3/4" Sealtite flex cond.	5	EA	0.80	5	22.66	12.50		\$110		\$70		\$180	
0	Push botton station	13	EA	2.30	35	22.66	120.00		\$780		\$1,710		\$2,500	
0	3/4" Galv rigid cond.	4800	LF	0.08	455	22.66	0.95		\$10,310		\$4,990		\$15,300	
0	1" Galv rigid cond.	2400	LF	0.11	313	22.66	1.44		\$7,090		\$3,780		\$10,870	
0	3/4" "L" ftg w cover and gasket	96	EA	1.00	114	22.66	9.90		\$2,580		\$1,040		\$3,620	
0	1" "L" ftg w cover and gasket	48	EA	1.20	68	22.66	14.50		\$1,540		\$760		\$2,300	
0	3/4" Conduit union "UNY"	40	EA	0.80	38	22.66	7.90		\$860		\$350		\$1,210	
0	1" Conduit union "UNY"	20	EA	1.00	24	22.66	13.40		\$540		\$290		\$830	
0	3/4" Conduit seal "EYS"	14	EA	0.90	15	22.66	10.00		\$340		\$150		\$490	
0	1" Conduit seal "EYS"	7	EA	1.00	8	22.66	13.00		\$180		\$100		\$280	
0	3/4" Conduit hub	14	EA	0.80	13	22.66	4.40		\$290		\$70		\$360	
0	1" Conduit hub	7	EA	1.00	8	22.66	5.20		\$180		\$40		\$220	
0	Control wire 3#14	5460	LF	0.03	175	22.66	0.21		\$3,970		\$1,250		\$5,220	
0	Power wire 3#12 w/#12 grd	5040	LF	0.04	215	22.66	0.36		\$4,870		\$1,980		\$6,850	
0	Power wire 3#8 w/#10 grd	2520	LF	0.05	158	22.66	0.60		\$3,580		\$1,650		\$5,230	
0	Wire term 1/c #14	78	EA	0.20	18	22.66	0.20		\$410		\$20		\$430	
0	Wire term 1/c #12	72	EA	0.20	17	22.66	0.25		\$390		\$20		\$410	
0	Wire term 1/c #10	12	EA	0.20	3	22.66	0.25		\$70		\$20		\$90	
0	Wire term 1/c #8	18	EA	0.20	4	22.66	0.90		\$80		\$90		\$180	
0	Motor conn. kit #14-#10	7	EA	0.50	4	22.66	12.00		\$90		\$90		\$180	
0	Motor conn. kit #8-#4	6	EA	0.60	4	22.66	21.00		\$90		\$140		\$230	
0	13. Miscellaneous and support material	1	LOT	177.00	210	22.66			\$4,760				\$4,760	
<u>Lead Preparation 15</u>														
0	1. Install 480v pr. & mtr. feeders up to 10hp	8	EA	12.9	122	22.66	181.00		\$2,760		\$1,580		\$4,340	
0	2. Install 480v pr. & mtr. feeders 20,25,40hp	10	EA	13.2	156	22.66	184.00		\$3,530		\$1,790		\$5,320	
0	3. Install 1-1/2" seal. flex conduit	1	LOT	1.5	2	22.66	35.70		\$50		\$40		\$90	
0	4. Install start-stop station fac. sealed	18	EA	2.3	49	22.66	120.00		\$1,110		\$2,360		\$3,470	
0	5. Install 100a-600v LDS expl. proof	1	EA	4.2	5	22.66	335.00		\$110		\$370		\$480	
0	6. Install 3/4" cond. galv. stl.	4000	FT	0.08	379	22.66	0.95		\$8,590		\$4,180		\$12,770	
0	7. Install 1" cond. galv. stl.	5000	FT	0.11	852	22.66	1.44		\$14,770		\$7,800		\$22,570	
<u>Subtotal Direct Cost</u>														

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MATT	EQUIP	TOTAL
				Unit	Total	Rate	Labo	SIC					
0	7. Install 1-1/2" cond. galv. stl.	500	FT	0.14	83	22.66							\$3,140
0	8. Install 3/4"-L-flg. with cover & gasket	80	EA	1.0	95	22.66			\$1,880				\$3,020
0	9. Install 1"-L-flg. with cover & gasket	100	EA	1.2	142	22.66			\$2,150				\$4,810
0	9. Install 1-1/2"-L-flg. with cover & gasket	10	EA	2.0	24	22.66			\$3,220				\$840
0	10. Install 3/4" cond. union UNY	32	EA	0.8	30	22.66			\$540				\$960
0	11. Install 1" cond. union UNY	40	EA	1.0	47	22.66			\$680				\$1,680
0	11. Install 1-1/2" cond. union UNY	6	EA	1.5	11	22.66			\$1,070				\$430
0	12. Install 3/4" cond. seal "EYS"	9	EA	0.9	10	22.66			\$250				\$330
0	13. Install 1" cond. seal "EYS"	11	EA	1.0	13	22.66			\$230				\$450
0	13. Install 1-1/2" cond. seal "EYS"	1	EA	1.5	2	22.66			\$290				\$80
0	14. Install 3/4" cond. hub	9	EA	0.8	9	22.66			\$50				\$240
0	15. Install 1" cond. hub	11	EA	1.0	13	22.66			\$200				\$350
0	15. Install 1-1/2" cond. hub	2	EA	1.0	2	22.66			\$80				\$70
0	16. Install 3-#14cntrl. wire, str. cu 600v	9400	FT	0.03	301	22.66			\$290				\$8,980
0	17. Install 3 #12w/ #12 grd. power wire	4120	FT	0.04	176	22.66			\$3,990				\$5,610
0	18. Install 3 #8w/ #10 grd. power wire	4850	FT	0.05	292	22.66			\$6,820				\$9,670
0	18. Install 3 #6w/ #8 grd. power wire	520	FT	0.06	36	22.66			\$820				\$1,300
0	19. Install 3 #2w/ #8 grd. power wire	520	FT	0.08	47	22.66			\$1,070				\$2,010
0	20. Install 1/c #14 wire term, 600v	108	EA	0.2	26	22.66			\$590				\$610
0	21. Install 1/c #12 wire term, 600v	40	EA	0.2	9	22.66			\$200				\$210
0	21. Install 1/c #10 wire term, 600v	9	EA	0.2	2	22.66			\$50				\$260
0	22. Install 1/c #8 wire term, 600v	29	EA	0.3	10	22.66			\$230				\$20
0	22. Install 1/c #6 wire term, 600v	3	EA	0.4	1	22.66			\$20				\$90
0	23. Install 1/c #2 wire term, 600v	6	EA	0.4	3	22.66			\$70				\$20
0	23. Install starter & fused disc. switch		EA	4.0		22.66			\$200.00				\$80
0	24. Install 2- #4/0mtr. cont. kit, 600v		EA	1.0		22.66			\$30.00				\$220
0	25. Install 14- #10 mtr. cont. kit, 600v	8	EA	0.5	5	22.66			\$110				\$390
0	26. Install 8- #4 mtr. cont. kit, 600v	10	EA	0.6	7	22.66			\$160				\$7,050
0	27. Install flex cond. conn. assy	157	EA	1.1	205	22.66			\$4,650				\$7,730
0	28. Install st. box 20"x20"x8" w/term.	8	EA	10.3	98	22.66			\$2,220				\$10,050
0	29. Install 3/4" galv. ridg. stl. conduit	3150	FT	0.08	299	22.66			\$6,780				\$3,370
0	30. Install 1" galv. ridg. stl. conduit	740	FT	0.11	97	22.66			\$2,200				\$4,210
0	31. Install 1-1/2" galv. ridg. stl. conduit	870	FT	0.14	111	22.66			\$2,520				\$2,710
0	32. Install 2" galv. ridg. stl. conduit	340	FT	0.17	69	22.66			\$1,560				\$5,210
0	33. Install 3/4" "L" ftg. w/cover & gasket	138	EA	1.00	164	22.66			\$3,720				\$1,350
0	34. Install 1" "L" ftg. w/cover & gasket	28	EA	1.20	40	22.66			\$910				\$2,330
0	35. Install 1-1/2" "L" ftg. w/cover & gasket	28	EA	2.00	66	22.66			\$1,500				\$830

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	MAT'L	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l			
0	36. Install 2" "L" ftg. w/cover & gasket	15	EA	2.50	44	22.66		42.00	\$1,000	\$890	\$1,690	
0	37. Install 3/4" "T" ftg. w/cover & gasket	152	EA	1.20	218	22.66		11.30	\$4,880	\$1,880	\$6,770	
0	38. Install 1" "T" ftg. w/cover & gasket	28	EA	1.50	50	22.66		16.80	\$1,130	\$510	\$1,640	
0	39. Install 1-1/2" "T" ftg. w/cover & gasket	28	EA	2.50	83	22.66		30.30	\$1,880	\$830	\$2,810	
0	40. Install 2" "T" ftg. w/cover & gasket	30	EA	3.00	107	22.66		46.30	\$2,420	\$1,150	\$3,940	
0	40. Install 2" Conduit hub	8	EA	1.90	18	22.66		11.00	\$410	\$100	\$510	
0	40. Install 2" Conduit seal "EYS"	8	EA	1.60	15	22.66		30.20	\$340	\$280	\$600	
0	41. Install 3/4" conduit union "UNY"	53	EA	0.80	50	22.66		7.90	\$1,130	\$460	\$1,590	
0	42. Install 1" conduit union "UNY"	11	EA	1.00	13	22.66		13.40	\$280	\$180	\$460	
0	43. Install 1-1/2" conduit union "UNY"	11	EA	1.50	20	22.66		26.70	\$450	\$320	\$770	
0	44. Install 2" conduit union "UNY"	7	EA	1.90	16	22.66		34.40	\$360	\$280	\$620	
0	47. Install 1/2" conduit drain	114	EA	0.20	27	22.66		25.00	\$610	\$3,120	\$3,730	
0	48. Install 1pr-#16 str cu shld. w/pvc jkt, 300v	15800	FT	0.02	333	22.66		0.23	\$7,550	\$3,930	\$11,480	
0	49. Install 1pr-#16 wire termination, 300v	314	EA	0.40	149	22.66		0.30	\$3,380	\$100	\$3,480	
0	49. Miscellaneous and support materials Equipment No. 16	1	LOT	427.00	506	22.66			\$11,470		\$11,470	
0	Motor flex conduit conn. to 10 HP	6	EA	12.90	92	22.66		161.00	\$2,080	\$1,190	\$3,270	
0	Motor flex conduit conn. to 20 HP	3	EA	13.20	47	22.66		164.00	\$1,070	\$540	\$1,610	
0	3/4" Sealite flex cond.	4	EA	0.80	4	22.66		12.50	\$90	\$50	\$140	
0	Push button station	8	EA	2.30	25	22.66		120.00	\$570	\$1,180	\$1,750	
0	3/4" Galv rigid cond.	3600	LF	0.08	341	22.66		0.95	\$7,730	\$3,740	\$11,470	
0	1" Galv rigid cond.	1800	LF	0.11	235	22.66		1.44	\$5,330	\$2,840	\$8,170	
0	3/4" "L" ftg w cover and gasket	72	EA	1.00	85	22.66		9.90	\$1,930	\$780	\$2,710	
0	1" "L" ftg w cover and gasket	36	EA	1.20	51	22.66		14.50	\$1,180	\$570	\$1,730	
0	3/4" Conduit union "UNY"	30	EA	0.80	28	22.66		7.90	\$630	\$260	\$890	
0	1" Conduit union "UNY"	16	EA	1.00	19	22.66		13.40	\$430	\$230	\$660	
0	3/4" Conduit seal "EYS"	10	EA	0.90	11	22.66		10.00	\$250	\$110	\$360	
0	1" Conduit seal "EYS"	5	EA	1.00	6	22.66		13.00	\$140	\$70	\$210	
0	3/4" Conduit hub	10	EA	0.80	9	22.66		4.40	\$200	\$50	\$250	
0	1" Conduit hub	5	EA	1.00	6	22.66		5.20	\$140	\$30	\$170	
0	Control wire 3#14	4100	LF	0.03	131	22.66		0.21	\$2,970	\$940	\$3,910	
0	Power wire 3#12 w/#12 grd	3800	LF	0.04	162	22.66		0.36	\$3,670	\$1,500	\$5,170	
0	Power wire 3#8 w/#10 grd	1900	LF	0.05	119	22.66		0.60	\$2,700	\$1,250	\$3,950	
0	Wire term 1/c #14	58	EA	0.20	14	22.66		0.20	\$320	\$10	\$330	
0	Wire term 1/c #12	54	EA	0.20	13	22.66		0.25	\$290	\$10	\$300	
0	Wire term 1/c #10	8	EA	0.20	2	22.66		0.25	\$50	\$50	\$100	
0	Wire term 1/c #8	14	EA	0.20	3	22.66		0.90	\$70	\$10	\$80	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Lebor	S/C				
D	Motor conn. kit #14-#10	5	EA	0.50	3	22.86			\$70	\$70		\$140
D	Motor conn. kit #8-#4	4	EA	0.80	3	22.86			\$70	\$70		\$180
D	13. Miscellaneous and support material Equipment_No_17	1	LOT	133.00	158	22.86			\$3,580	\$3,580		\$3,580
D	1. Install mtr. flex conduit conn. essy. up to	2	EA	12.9	31	22.86			\$700	\$700		\$1,100
D	2. Install mtr. flex conduit conn. essy. up to	8	EA	11.1	79	22.86			\$1,790	\$1,790		\$3,230
D	3. Install starter & fused disc. switch	8	EA	2.3	22	22.86			\$500	\$500		\$1,550
D	4. Install 3/4" cond. galv. stl.	3100	FT	0.08	294	22.86			\$6,860	\$6,860		\$8,860
D	5. Install 2" cond. galv. stl.	1100	FT	0.17	222	22.86			\$5,030	\$5,030		\$8,740
D	6. Install 3/4" "L" ftg. w/ cover & gasket	84	EA	1.00	76	22.86			\$1,720	\$690		\$2,410
D	7. Install 2" "LBD" ftg. w/ cover & gasket	21	EA	2.50	62	22.86			\$1,400	\$1,250		\$2,650
D	8. Install 3/4" cond. union "UNY"	27	EA	0.8	26	22.86			\$590	\$230		\$820
D	9. Install 2" cond. union "UNY"	8	EA	1.9	18	22.86			\$410	\$300		\$710
D	10. Install 3/4" cond. seal "EYS"	8	EA	0.9	9	22.86			\$200	\$90		\$290
D	11. Install 2" cond. seal "EYS"	3	EA	1.8	6	22.86			\$140	\$100		\$240
D	12. Install 3/4" cond. hub	8	EA	0.8	8	22.86			\$180	\$40		\$220
D	13. Install 2" cond. hub	3	EA	1.9	7	22.86			\$160	\$40		\$200
D	14. Install contrl. wire 3-#14	3300	FT	0.0	105	22.86			\$2,400	\$760		\$3,160
D	15. Install power wire 3 #12 w/#12 grd.	2200	FT	0.04	94	22.86			\$2,130	\$870		\$3,000
D	16. Install power wire 3 #3/0 w/#4 grd.	1100	FT	0.14	178	22.86			\$3,890	\$4,770		\$8,760
D	17. Install wire term. , 600v, 1/c #14	48	EA	0.20	11	22.86			\$250	\$10		\$260
D	18. Install wire term. , 600v, 1/c #12	28	EA	0.20	6	22.86			\$140	\$10		\$150
D	19. Install wire term. , 600v, 1/c #4	8	EA	0.40	3	22.86			\$70	\$10		\$80
D	20. Install wire term. , 600v, 1/c #3/0	9	EA	1.00	11	22.86			\$250	\$40		\$290
D	21. Install Mtr. cont. kit, 600v, #14 - #10	2	EA	0.50	1	22.86			\$20	\$30		\$50
D	22. Install Mtr. cont. kit, 600v, #2 - #4/0	8	EA	1.00	7	22.86			\$180	\$210		\$370
D	22. Miscellaneous and support material	1	LOT	120.00	142	22.86			\$3,220			\$3,220

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	MAT'L	EQUIP	TOTAL	
				Unit	Total		Labo	SIC	Mat'l					Equip
	<u>Equipment No. 25</u>													
0	1. Install motor flex conn. to 10 HP	12	LOT	12.9	184	22.66		181.00				\$4,170	\$2,380	\$6,550
0	2. Install motor flex conn.to 20HP	1	LOT	13.2	16	22.66		164.00				\$360	\$180	\$540
0	3. Install "push button station	13	EA	2.3	35	22.66		120.00				\$790	\$1,710	\$2,500
0	4. Install 3/4" conduit galv. rigid stl.	3800	FT	0.08	360	22.66		0.95				\$8,160	\$3,950	\$12,110
0	5. Install 1" conduit galv. rigid stl.	230	FT	0.11	30	22.66		1.44				\$680	\$360	\$1,040
0	6. Install 3/4" "L" ftg. w/cover & gasket	76	EA	1.00	90	22.66		9.90				\$2,040	\$820	\$2,860
0	6. Install 1" "L" ftg. w/cover & gasket	5	EA	1.20	7	22.66		14.50				\$160	\$80	\$240
0	7. Install 3/4" conduit union "UNY"	31	EA	0.80	29	22.66		7.90				\$660	\$270	\$930
0	7. Install 1" conduit union "UNY"	2	EA	1.00	2	22.66		13.40				\$50	\$30	\$80
0	8. Install 3/4" conduit seal "EYS"	12	EA	0.90	13	22.66		10.00				\$290	\$130	\$420
0	8. Install 1" conduit seal "EYS"	1	EA	1.00	1	22.66		13.00				\$20	\$10	\$30
0	9. Install 3/4" conduit hub	12	EA	0.80	11	22.66		4.40				\$250	\$60	\$310
0	9. Install 1" conduit hub	1	EA	1.00	1	22.66		5.20				\$20	\$10	\$30
0	10. Install control wire 3#14	4200	FT	0.03	134	22.66		0.21				\$3,040	\$960	\$4,000
0	11. Install power wire 3#12 w/ #12 grd.	4000	FT	0.04	171	22.66		0.36				\$3,870	\$1,580	\$5,450
0	12. Install power wire 3#8 w/ #10 grd.	240	FT	0.05	15	22.66		0.60				\$340	\$160	\$500
0	13. Install wire termination 1/c #14	74	EA	0.20	18	22.66		0.20				\$410	\$20	\$430
0	14. Install wire termination 1/c #12	58	EA	0.20	14	22.66		0.25				\$320	\$20	\$340
0	15. Install wire termination 1/c #10	2	EA	0.20	1	22.66		0.25				\$20	\$20	\$40
0	16. Install wire termination 1/c #8	3	EA	0.30	1	22.66		0.90				\$20	\$160	\$180
0	17. 600 V motor conn #14-#10	12	EA	0.50	7	22.66		12.00				\$160	\$160	\$320
0	18. Install mtr. conn #8-#4, 600v	1	EA	0.60	1	22.66		21.00				\$20	\$20	\$40
0	19. Miscellaneous and support material	1	LOT	98.00	116	22.66						\$2,830	\$20	\$2,850
	<u>High Voltage.</u>													
0	2.000kVa Pad Mounted Transformer	1	EA	75.0	89	22.66						\$2,020	\$28,000	\$30,020
0	2 power Poles,Air break Switch,Cutouts,etc.	1	lot	80.0	71	22.66						\$1,810	\$10,000	\$11,810
0	Switchgear	1	EA	125.0	148	22.66						\$3,350	\$33,000	\$36,350
0	3. Install 3" conduit galv. rigid stl.	60	FT	0.28	20	22.66		6.41				\$450	\$420	\$870
0	4. Install 3" "LBD" ftg. w/cover & gasket	2	EA	4.50	11	22.66		160.50				\$250	\$350	\$600
0	5. Install 3" conduit union "UNY"	2	EA	2.50	8	22.66		76.00				\$140	\$170	\$310
0	6. Install 3" cond. hub	4	EA	2.50	12	22.66		33.30				\$270	\$150	\$420
0	7. Install power wire 3#10 w/ #4 grd.	100	FT	0.17	20	22.66		8.11				\$450	\$890	\$1,340

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l				
0	8. Install wire term. 600v, 1/c #4	4	EA	0.40	2	22.66		1.30	\$50	\$10		\$60	
0	9. Install term. kit 15kv 1/c #2/0	12	EA	4.00	57	22.66		80.00	\$1,290	\$1,050		\$2,340	
0	13. Miscellaneous and support material 480V Distribution	1	LOT	8.00	9	22.66			\$200			\$200	
0	Motor Control Centers	1	LOT	480.00	589	22.66			\$12,890		\$250,000	\$262,890	
0	Portable Power Distribution Center	1	EA	50.00	59	22.66			\$1,340		\$9,000	\$10,340	
0	Heat Tracing Panel	1	EA	25.00	30	22.66			\$680		\$14,000	\$14,680	
0	Power Panels	2	EA	15.00	36	22.66			\$820		\$10,000	\$10,820	
0	Lighting Panels	2	EA	15.00	36	22.66			\$820		\$10,000	\$10,820	
0	Capacitors	20	EA	5.00	119	22.66			\$2,700		\$24,000	\$26,700	
0	Motor Starters	15	EA	8.00	142	22.66			\$3,220		\$60,000	\$63,220	
0	7. Install 3" "LBD" ffg. w/ cover & gasket	15	EA	4.50	80	22.66		160.50	\$1,810	\$2,830		\$4,640	
0	9. Install mini-power xfmr/panel, 30kva	9	EA	50.00	534	22.66			\$12,100		\$29,540	\$41,640	
0	10. Install 3" galv. rigid stl. conduit	800	FT	0.28	199	22.66		8.41	\$4,510			\$8,720	
0	11. Install 3" conduit union "UNY"	15	EA	2.50	44	22.66		76.00	\$1,000	\$1,250		\$2,250	
0	12. Install 3" cond. hub	30	EA	2.50	89	22.66		33.30	\$2,020	\$1,090		\$3,110	
0	13. Install power wire 3#350KCMw/#1 grd	900	FT	0.20	214	22.66		8.18	\$4,850	\$8,050		\$12,900	
0	15. Install wire term. 600v, 1/c #10	30	EA	0.7	25	22.66		2.75	\$570	\$90		\$660	
0	16. Install wire term. 600v, 1/c #350kcm	90	EA	1.50	160	22.66		6.20	\$3,630	\$810		\$4,440	
0	17. Install 3" galv. rigid. stl. conduit	120	FT	0.28	40	22.66		6.41	\$910	\$840		\$1,750	
0	19. Install 3" "LBD" ffg w/ cover and gasket	3	EA	4.50	16	22.66		160.50	\$360	\$530		\$890	
0	11. Install 3" conduit union "UNY"	3	EA	2.50	9	22.66		76.00	\$200	\$250		\$450	
0	12. Install 3" cond. hub	6	EA	2.50	18	22.66		33.30	\$410	\$220		\$630	
0	13. Install power wire 3#350KCMw/#1 grd	180	FT	0.2	43	22.66		8.18	\$970	\$1,810		\$2,580	
0	15. Install p15. Install wire term. 600v, 1/c #10	6	EA	0.7	5	22.66		2.75	\$110	\$20		\$130	
0	22. Install #8. Install wire term. 600v, 1/c #35	18	EA	1.5	32	22.66		6.20	\$730	\$120		\$850	
0	23. Install 1-1/2" rigid galv cond.	40	FT	0.1	7	22.66		2.30	\$160	\$100		\$260	
0	24. Install 1-1/2" "L" ffg	2	EA	2.0	5	22.66		27.00	\$110	\$60		\$170	
0	11. Install 1-1/2" conduit union "UNY"	1	EA	1.5	2	22.66		26.70	\$50	\$30		\$80	
0	26. Install 1-1/2" conduit hub	2	EA	1.50	4	22.66		7.90	\$90	\$20		\$110	
0	29. Install power wire 3#4w/#8 grd	80	FT	0.07	5	22.66		1.15	\$110	\$80		\$190	
0	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	22.66		0.90	\$20	\$20		\$40	
0	31. Install wire term. 600v, 1/c #4	6	EA	0.40	3	22.66		1.30	\$70	\$10		\$80	
0	30. Install 2" pvc sch 40 conduit U/G	700	FT	0.11	91	22.66		0.77	\$2,060	\$590		\$2,650	
0	31. Install 2" RSG 90 deg elbow	2	EA	1.20	3	22.66		69.60	\$70	\$150		\$220	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			Rate	COST/UNIT			LABOR	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate		Lab	S/C	Mat'l				
2	11. Install 2" conduit union "UNY"	2	EA	1.90	5	22.66		34.40			\$110	\$80	\$190	
0	11. Install 2" conduit seal "EYS"	1	EA	1.60	2	22.66		30.20			\$50	\$30	\$80	
0	12. Install 2" cond. hub	2	EA	1.90	5	22.66		11.00			\$110	\$20	\$130	
0	42. Install power wire 3#4 w/#8 grd	720	FT	0.05	45	22.66		1.15			\$1,020	\$910	\$1,930	
0	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	22.66		0.90			\$20	\$10	\$30	
0	31. Install wire term. 600v, 1/c #4	8	EA	0.40	3	22.66		1.30			\$70	\$10	\$80	
0	32. Install 1-1/2" rigid galv cond.	80	FT	0.14	13	22.66		2.30			\$290	\$200	\$490	
0	24. Install 1-1/2" "L" ftg	4	EA	2.0	8	22.66		27.00			\$200	\$120	\$320	
0	11. Install 1-1/2" conduit union "UNY"	1	EA	1.5	2	22.66		26.70			\$50	\$30	\$80	
0	26. Install 1-1/2" conduit hub	2	EA	1.50	4	22.66		7.90			\$90	\$20	\$110	
0	29. Install power wire 3#4w/#8 grd	100	FT	0.07	8	22.66		1.15			\$180	\$130	\$310	
0	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	22.66		0.90			\$20	\$10	\$30	
0	31. Install wire term. 600v, 1/c #4	8	EA	0.40	3	22.66		1.30			\$70	\$10	\$80	
0	30. Install 2" pvc sch 40 conduit U/G	400	FT	0.11	52	22.66		0.77			\$1,180	\$340	\$1,520	
0	31. Install 2" RSG 90 deg elbow	2	EA	1.20	3	22.66		69.80			\$70	\$150	\$220	
0	11. Install 2" conduit union "UNY"	2	EA	1.90	5	22.66		34.40			\$110	\$80	\$190	
0	11. Install 2" conduit seal "EYS"	1	EA	1.60	2	22.66		30.20			\$50	\$30	\$80	
0	12. Install 2" cond. hub	2	EA	1.90	5	22.66		11.00			\$110	\$20	\$130	
0	42. Install power wire 3#4 w/#8 grd	420	FT	0.05	28	22.66		1.15			\$590	\$530	\$1,120	
0	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	22.66		0.90			\$20	\$10	\$30	
0	31. Install wire term. 600v, 1/c #4	8	EA	0.40	3	22.66		1.30			\$70	\$10	\$80	
0	32. Install 1-1/2" rigid galv cond.	250	FT	0.14	41	22.66		2.30			\$830	\$630	\$1,500	
0	24. Install 1-1/2" "L" ftg	10	EA	2.0	24	22.66		27.00			\$540	\$300	\$840	
0	11. Install 1-1/2" conduit union "UNY"	4	EA	1.5	7	22.66		26.70			\$160	\$120	\$280	
0	26. Install 1-1/2" conduit hub	2	EA	1.50	4	22.66		7.90			\$90	\$20	\$110	
0	29. Install power wire 3#4w/#8 grd	270	FT	0.07	22	22.66		1.15			\$500	\$340	\$840	
0	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	22.66		0.90			\$20	\$10	\$30	
0	31. Install wire term. 600v, 1/c #4	8	EA	0.40	3	22.66		1.30			\$70	\$10	\$80	
0	30. Install 2" pvc sch 40 conduit U/G	200	FT	0.11	26	22.66		0.77			\$590	\$170	\$760	
0	11. Install 2" conduit union "UNY"	4	EA	1.20	6	22.66		69.60			\$140	\$300	\$440	
0	11. Install 2" conduit seal "EYS"	2	EA	1.90	9	22.66		34.40			\$200	\$150	\$350	
0	12. Install 2" cond. hub	4	EA	1.90	9	22.66		30.20			\$90	\$70	\$160	
0	42. Install power wire 3#4 w/#8 grd	240	FT	0.05	15	22.66		1.15			\$200	\$50	\$250	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	800 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
D	30. Install wire term. 600v, 1/c #8	4	EA	0.30	1	22.66			\$20		\$20		\$20	
D	31. Install wire term. 600v, 1/c #4	12	EA	0.40	6	22.66			\$140		\$20		\$160	
D	32. Install 1-1/2" rigid galv cond.	1400	FT	0.14	232	22.66			\$5,280		\$3,520		\$8,780	
D	24. Install 1-1/2" "L" ftg	58	EA	2.0	133	22.66			\$3,010		\$1,650		\$4,660	
D	11. Install 1-1/2" conduit union "UNY"	20	EA	1.5	36	22.66			\$820		\$580		\$1,400	
D	26. Install 1-1/2" conduit hub	8	EA	1.50	14	22.66			\$320		\$70		\$390	
D	29. Install power wire 3#4w/#8 grd	1480	FT	0.07	119	22.66			\$2,700		\$1,860		\$4,560	
D	30. Install wire term. 600v, 1/c #8	8	EA	0.30	3	22.66			\$70		\$10		\$80	
D	31. Install wire term. 600v, 1/c #4	24	EA	0.40	11	22.66			\$250		\$30		\$280	
D	30. Install 2" pvc sch 40 conduit U/G	430	FT	0.11	56	22.66			\$1,270		\$360		\$1,630	
D	31. Install 2" RSG 90 deg elbow	2	EA	1.20	3	22.66			\$70		\$150		\$220	
D	11. Install 2" conduit union "UNY"	2	EA	1.90	5	22.66			\$110		\$80		\$180	
D	11. Install 2" conduit seal "EYS"	1	EA	1.80	2	22.66			\$50		\$30		\$80	
D	12. Install 2" cond. hub	2	EA	1.90	5	22.66			\$110		\$20		\$130	
D	42. Install power wire 3#4 w/#8 grd	450	FT	0.05	28	22.66			\$630		\$570		\$1,200	
D	30. Install wire term. 600v, 1/c #8	2	EA	0.30	1	22.66			\$20		\$20		\$40	
D	31. Install wire term. 600v, 1/c #4	8	EA	0.40	3	22.66			\$70		\$10		\$80	
D	Machine trenching	278	CY	0.30	98	18.64			\$1,920				\$1,920	
D	Backfill and compaction	209	CY	0.40	99	18.64			\$1,840				\$1,840	
D	Load haul and dump	110	CY	0.10	13	18.64			\$260				\$260	
D	Ductbank	96	CY	3.80	433	20.34			\$8,810		\$8,660		\$18,470	
D	13. Miscellaneous and support material Standby Electrical	1	LOT	157.00	186	22.66			\$4,210				\$4,210	
D	1. Install generator	1	EA	175.0	207	22.66			\$4,690			\$200,000	\$204,690	
D	2. Install Transfer Switch (30-TS-001)	1	EA	80.0	71	22.66			\$1,610			\$30,000	\$31,610	
D	3. Install 3" conduit galv. rigid stl.	510	FT	0.28	169	22.66			\$3,830		\$3,580		\$7,410	
D	4. Install 3" "LBD" ftg. w/cover & gasket	18	EA	4.50	96	22.66			\$2,180		\$3,160		\$5,340	
D	5. Install 3" conduit union "UNY"	9	EA	2.50	27	22.66			\$810		\$750		\$1,560	
D	7. Install 3" cond. hub	18	EA	2.50	53	22.66			\$1,200		\$660		\$1,860	
D	8. Install power wire 3#350kcm w/ #1/0 grd	690	FT	0.20	164	22.66			\$3,720		\$6,170		\$9,890	
D	9. Install wire term. 600v, 1/c #10	18	EA	0.70	15	22.66			\$340		\$50		\$390	
D	10. Install wire term. 600v, 1/c #350kcm	54	EA	1.50	96	22.66			\$2,180		\$370		\$2,550	
D	13. Miscellaneous and support material	1	LOT	43.00	51	22.66			\$1,160				\$1,160	
D	14. Install Switchgear (32-sg-001)	1	EA	35.0	41	22.66			\$830				\$830	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Equip	Mat'l	Rate					
2	Uninterruptible Power													
0	1. Install uninterruptible power sply/tup-33-001	1	EA	140.0	166	22.66			\$3,760			\$30,000	\$33,760	
0	2. Install local disc. switch 60a-600v	1	EA	50.0	59	22.66			\$1,340			\$15,000	\$16,340	
0	3. Install 1-1/2" conduit galv. rigid stl.	200	FT	0.14	33	22.66		2.30	\$750		\$500		\$1,250	
0	4. Install 1-1/2" "L" ftg. w/cover & gasket	7	EA	2.00	17	22.66		27.00	\$390		\$210		\$600	
0	5. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	22.66		28.70	\$110		\$90		\$200	
0	6. Install 1-1/2" conduit seal "EYS"	1	EA	1.40	2	22.66		23.20	\$50		\$30		\$80	
0	7. Install 1-1/2" cond. hub	2	EA	1.50	4	22.66		7.90	\$90		\$20		\$110	
0	8. Install power wire 3#4 w/ #8 grd.	215	FT	0.07	17	22.66		1.15	\$390		\$270		\$660	
0	9. Install wire term. 600v, 1/c #8	2	EA	0.30	1	22.66		0.90	\$20		\$10		\$20	
0	10. Install wire term. 600v, 1/c #4	6	EA	0.40	3	22.66		1.30	\$70		\$10		\$80	
0	13. Miscellaneous and support material	1	LOT	8.00	9	22.66			\$200				\$200	
	<u>Lighting</u>													
0	1. Install rnd. stl. pole w/2" tenon	20	EA	12.0	285	22.66		910.00	\$6,460		\$19,910		\$26,370	
0	2. Install stl. arm w/fittings	12	EA	4.0	57	22.66		160.00	\$1,290		\$2,100		\$3,390	
0	3. Install stl. brkt. for floodlights	17	EA	1.00	20	22.66		90.00	\$450		\$1,670		\$2,120	
0	4. Install rdwy. fixt. 400w w/lamp	12	EA	3.60	51	22.66		370.00	\$1,160		\$4,860		\$6,020	
0	5. Install fldlight fixt. 250w w/lamp	37	EA	3.30	145	22.66		300.00	\$3,290		\$12,140		\$15,430	
0	6. Install 1" pvc sch.40 conduit	2300	FT	0.07	191	22.66		0.37	\$4,330		\$930		\$5,260	
0	7. Install 1" rsg conduit elbow	44	EA	0.40	21	22.66		17.50	\$480		\$840		\$1,320	
0	8. Install 1" sealing hub	44	EA	0.80	42	22.66		14.60	\$950		\$700		\$1,650	
0	9. Install 1-1/2" insult. grd. bushing	44	EA	0.80	42	22.66		12.60	\$950		\$610		\$1,560	
0	10. Install #2 grd. wire cont. type "KC"	22	EA	0.50	13	22.66		14.80	\$290		\$360		\$650	
0	11. Install str. cu 600v, 3#10 w/ #10 grd.	2500	FT	0.04	130	22.66		0.48	\$2,950		\$1,310		\$4,260	
0	12. Install str. cu 600v, 3#12 w/ #12 grd.	800	FT	0.04	34	22.66		0.36	\$770		\$320		\$1,090	
0	13. Install mach. trench. for lighting	357	CY	0.30	127	22.66			\$2,880				\$2,880	
0	14. Install mach. excav. for lighting	116	CY	0.50	69	22.66			\$1,560				\$1,560	
0	15. Backfill & compact	381	CY	0.40	181	19.64			\$3,550				\$3,550	
0	16. Load, haul & dump	163	CY	0.10	19	19.64			\$370				\$370	
0	17. Install concrete elect. ductbank	128	CY	3.8	568	19.64		92.00	\$11,160		\$12,680		\$23,840	
0	18. Install concrete stl. pole footing	20	CY	16.9	401	20.34		176.00	\$8,160		\$3,850		\$12,010	
	<u>Grounding</u>													
0	1. Install grd. well assy.	44	EA	8.0	417	22.66		143.00	\$9,450		\$6,880		\$16,330	
0	2. Install grd. test bar assy.	14	EA	7.7	128	22.66		169.00	\$2,900		\$2,590		\$5,490	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	800 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Lab	SIC	Mat'l					
D	3. Install power transf. grdg.	2	EA	3.60	9	22.66			51.50		\$110		\$200	\$310
D	4. Install switchgear grdg.	2	EA	2.50	6	22.66			56.50		\$120		\$140	\$260
D	5. Install MCC grounding	8	EA	2.50	24	22.66			56.50		\$480		\$540	\$1,030
D	6. Install storage tank grdg.	20	EA	1.00	24	22.66			17.80		\$380		\$540	\$930
D	7. Vessel or exchanger grdg	2	EA	2.30	5	22.66			25.40		\$80		\$110	\$170
D	8. Install stl. colm. grdg.	102	EA	1.00	121	22.66			17.80		\$1,980		\$2,740	\$4,730
D	9. Install fence post grdg.	8	EA	1.00	7	22.66			57.20		\$380		\$180	\$540
D	10. Install fence gate grdg.	2	EA	2.70	6	22.66			148.80		\$330		\$140	\$470
D	11. Install misc. equip. grdg.	10	EA	1.00	12	22.66			17.80		\$190		\$270	\$460
D	12. Install #4/O to #4/O "T" weld	60	EA	2.00	142	22.66			10.15		\$670		\$3,220	\$3,890
D	13. Install #4/O to #2 "T" weld	110	EA	2.00	261	22.66			7.55		\$910		\$5,910	\$6,820
D	14. Install 1/c #2 str. cu grd. wire	2500	FT	0.03	89	22.66			0.49		\$1,340		\$2,020	\$3,360
D	15. Install 1/c #4/o str. cu grd. wire	4500	FT	0.02	107	22.66			1.47		\$7,240		\$2,420	\$9,660
D	16. Install mach. excav. for grd. well	4	CY	0.50	2	19.64					\$40		\$40	\$40
D	17. Install mach. trench. for grd. wire	224	CY	0.3	80	19.64					\$1,570		\$1,570	\$1,570
D	18. Backfill & compaction	281	CY	0.4	124	19.64					\$2,440		\$2,440	\$2,440
	<u>Lightning Protection</u>													
D	1. Install air term. w/ base 3/8" x 10" rf. mtc	50	EA	1.2	71	22.66			25.00		\$1,370		\$1,610	\$2,980
D	2. Install #2/O str. cu wire	1800	FT	0.03	53	22.66			0.94		\$1,850		\$1,200	\$3,050
D	3. Install #2/O - #4/O "T" exothermic weld	10	EA	2.00	24	22.66			7.55		\$80		\$540	\$620
D	13. Miscellaneous and support material	1	LOT	37.00	44	22.66					\$1,000		\$1,000	\$1,000
	<u>Plant & Instrument Air</u>													
D	1. Install mtr. flex cond. conn. assy. 10hp	1	EA	12.9	15	22.66			181.00		\$200		\$340	\$540
D	2. Install mtr. flex cond. conn. assy. 100hp	2	EA	10.10	24	22.66			187.00		\$410		\$540	\$950
D	3. Install 3/4" sealite flex cond w/2 cond.	2	LOT	0.80	2	22.66			12.05		\$30		\$50	\$80
D	4. Install starter & fused disc. switch	3	EA	2.50	9	22.66			150.00		\$480		\$200	\$680
D	5. Install start-stop button station	3	EA	2.30	8	22.66			120.00		\$390		\$180	\$570
D	6. Install 3/4" conduit galv. stl.	780	FT	0.08	74	22.66			0.95		\$810		\$1,680	\$2,490
D	7. Install 2" conduit galv. stl.	195	FT	0.17	39	22.66			2.30		\$480		\$880	\$1,370
D	8. Install 3/4" "L" fig. w/ cover & gasket	30	EA	1.00	36	22.66			9.90		\$320		\$820	\$1,140
D	9. Install 1-1/2" "LBD" fig. w/ cover & gasket	5	EA	2.00	12	22.66			27.00		\$150		\$270	\$420
D	10. Install 3/4" conduit union "UNY"	12	EA	0.80	11	22.66			7.90		\$100		\$250	\$350
D	11. Install 1-1/2" conduit union "UNY"	3	EA	1.50	5	22.66			26.70		\$80		\$110	\$200
D	12. Install 3/4" conduit seal "EYS"	6	EA	0.90	6	22.66			10.00		\$70		\$140	\$210

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
D	13. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	22.66			23.20		\$50		\$120	
D	14. Install 3/4" conduit hub	6	EA	0.80	6	22.66			4.40		\$30		\$170	
D	15. Install 1-1/2" conduit hub	2	EA	1.50	4	22.66			7.90		\$20		\$110	
D	16. Install cntrl. wire str. cu #3#14	430	FT	0.03	14	22.66			0.21		\$100		\$420	
D	17. Install power wire str. cu #3#12 w/#12 grd.	850	FT	0.04	28	22.66			0.36		\$260		\$890	
D	19. Install wire term. 600v 1/c#14	18	EA	0.20	4	22.66			0.20		\$10		\$80	
D	20. Install wire term. 600v 1/c#12	36	EA	0.20	9	22.66			0.25		\$200		\$210	
D	21. Install wire term. 600v 1/c#4	3	EA	0.40	1	22.66			1.30		\$30		\$20	
D	22. Install wire term. 600v 1/c#4/O	9	EA	1.10	12	22.66			3.20		\$30		\$300	
D	23. Install mtr. cont. kit 600v #14-#10	2	EA	0.50	1	22.66			\$20		\$30		\$50	
D	24. Install mtr. cont. kit 600v #2-#4/O	2	EA	1.00	2	22.66			\$50		\$70		\$120	
D	13. Miscellaneous and support material	1	LOT	29.00	34	22.66			\$770				-\$770	
D	<u>Breathing Air System</u>													
D	1. Install motor flex cond. 50hp	2	EA	15.9	38	22.66			\$800		\$540		\$1,400	
D	2. Install starter & fused disct. switch	2	EA	2.3	5	22.66			\$110		\$280		\$370	
D	3. Install 1-1/2" conduit galv. rigid sti.	800	FT	0.14	133	22.66			\$3,010		\$2,010		\$5,020	
D	4. Install 1-1/2" "L" ftg. w/cover & gasket	16	EA	2.00	38	22.66			\$680		\$470		\$1,330	
D	5. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	22.66			\$250		\$180		\$430	
D	6. Install 1-1/2" conduit seal "EYS"	2	EA	1.40	3	22.66			\$70		\$50		\$120	
D	7. Install 1-1/2" cond. hub	2	EA	1.50	4	22.66			\$90		\$20		\$110	
D	8. Install power wire 3#4 w/ #8 grd.	830	FT	0.07	67	22.66			\$1,520		\$1,040		\$2,560	
D	9. Install wire term. 600v, 1/c #8	4	EA	0.30	1	22.66			\$20		\$20		\$20	
D	10. Install wire term. 600v, 1/c #4	12	EA	0.40	6	22.66			\$140		\$20		\$160	
D	11. Install mtr. cont. kit 600v #8-#4	2	EA	0.60	1	22.66			\$20		\$50		\$70	
D	13. Miscellaneous and support material	1	LOT	30.00	36	22.66			\$820				\$820	
D	Electrical for Process,HVAC and Shield Doors	1	LOT	2448.0	2904	22.66			\$65,800		\$36,970		\$102,770	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
	<u>Equipment No. 44</u>													
0	2. Install motor flex conn. to 10HP	2	EA	12.90	31	22.66		181.00	\$700		\$400		\$1,100	
0	3. Install push button station	2	EA	2.30	5	22.66		120.00	\$110		\$260		\$370	
0	4. Install 3/4" sealite flex cond.	2	EA	0.80	2	22.66		12.05	\$50		\$30		\$80	
0	6. Install 3/4" conduit galv. stl.	1530	FT	0.08	145	22.66		0.95	\$3,280		\$1,590		\$4,880	
0	8. Install 3/4" "L" fig. w/ cover & gasket	30	EA	1.00	36	22.66		9.90	\$820		\$320		\$1,140	
0	10. Install 3/4" conduit union "UNY"	12	EA	0.80	11	22.66		7.90	\$250		\$100		\$350	
0	12. Install 3/4" conduit seal "EYS"	4	EA	0.90	4	22.66		10.00	\$90		\$40		\$130	
0	14. Install 3/4" conduit hub	4	EA	0.80	4	22.66		4.40	\$90		\$20		\$110	
0	17. Install power wire str. cu 3#12 w/#12grd.	1800	FT	0.04	68	22.66		0.36	\$1,540		\$630		\$2,170	
0	18. Install control wire 3#14	1280	FT	0.03	40	22.66		0.21	\$910		\$290		\$1,200	
0	20. Install wire term. 600v 1/c#14	12	EA	0.20	3	22.66		0.20	\$70		\$10		\$80	
0	21. Install wire term. 600v 1/c#12	24	EA	0.20	6	22.66		0.25	\$140		\$30		\$170	
0	23. Install mtr. cont. kit 600v #14-#10	2	EA	0.50	1	22.66		12.00	\$20		\$10		\$30	
0	13. Miscellaneous and support material	1	LOT	33.00	39	22.66			\$880				\$880	
	<u>Equipment No. 55</u>													
0	2. Install motor flex conn. to 10HP	2	EA	12.90	31	22.66		161.00	\$700		\$350		\$1,050	
0	2. Install start-stop button station	2	EA	2.30	5	22.66		120.00	\$110		\$260		\$370	
0	3. Install 3/4" conduit galv. stl.	680	FT	0.08	63	22.66		0.95	\$1,430		\$690		\$2,120	
0	4. Install 3/4" "L" fig. w/ cover & gasket	12	EA	1.00	14	22.66		9.80	\$320		\$130		\$450	
0	5. Install 3/4" conduit union "UNY"	6	EA	0.80	6	22.66		7.90	\$140		\$50		\$190	
0	6. Install 3/4" conduit seal "EYS"	2	EA	0.90	2	22.66		10.00	\$50		\$20		\$70	
0	7. Install 3/4" conduit hub	2	EA	0.80	2	22.66		4.40	\$50		\$10		\$60	
0	8. Install cntrl. wire 600v, 3#14	700	FT	0.03	22	22.66		0.21	\$500		\$180		\$680	
0	9. Install power wire 3#10 w/ #10 grd.	700	FT	0.04	37	22.66		0.48	\$840		\$370		\$1,210	
0	10. Install wire term. 600v, 1/c #14	12	EA	0.20	3	22.66		0.20	\$70		\$10		\$80	
0	11. Install wire term. 600v, 1/c #10	16	EA	0.20	4	22.66		0.25	\$90		\$20		\$110	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C-4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 -Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
D	12. Install mtr. conct. kit, 600v #14-#10	2	EA	0.50	1	22.66					\$30		\$50	
D	13. Miscellaneous and support material	1	LOT	16.00	19	22.66			\$430				\$430	
D	Motor flex conduit conn. to 10 HP	1	EA	12.90	15	22.66			\$340		\$200		\$540	
D	3/4" Sealite flex cond.	1	EA	0.80	1	22.66		181.00	\$20		\$10		\$30	
D	Push botton station	1	EA	2.30	3	22.66		12.50	\$20				\$30	
D	3/4" Galv rigid cond.	370	LF	0.08	35	22.66		120.00	\$70		\$130		\$200	
D	1" Galv rigid cond.	185	LF	0.11	24	22.66		0.95	\$790		\$380		\$1,170	
D	3/4" "L" ftg w cover and gasket	8	EA	1.00	9	22.66		1.44	\$540		\$280		\$830	
D	1" "L" ftg w cover and gasket	4	EA	1.20	6	22.66		9.90	\$200		\$80		\$280	
D	3/4" Conduit union "UNY"	4	EA	0.80	4	22.66		14.50	\$140		\$80		\$200	
D	1" Conduit union "UNY"	2	EA	1.00	2	22.66		7.90	\$90		\$30		\$120	
D	3/4" Conduit seal "EYS"	1	EA	0.90	1	22.66		13.40	\$50		\$30		\$80	
D	1" Conduit seal "EYS"	1	EA	1.00	1	22.66		10.00	\$20		\$10		\$30	
D	3/4" Conduit hub	1	EA	0.80	1	22.66		13.00	\$20		\$10		\$30	
D	1" Conduit hub	1	EA	1.00	1	22.66		4.40	\$20				\$20	
D	Control wire 3#14	420	LF	0.03	13	22.66		5.20	\$20		\$10		\$30	
D	Power wire 3#12 w/#12 grd	420	LF	0.04	18	22.66		0.21	\$290		\$100		\$390	
D	Power wire 3#8 w/#10 grd	190	LF	0.05	12	22.66		0.36	\$410		\$170		\$580	
D	Wire term 1/c #14	6	EA	0.20	1	22.66		0.60	\$270		\$120		\$390	
D	Wire term 1/c #12	6	EA	0.20	1	22.66		0.20	\$20				\$20	
D	Motor conn. kit #14-#10	1	EA	0.50	1	22.66		0.25	\$20				\$20	
D	13. Miscellaneous and support material	1	LOT	14.00	17	22.66		12.00	\$20		\$10		\$30	

DETAILED ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Lab	SIC					
D	22. Install power wire 3#1 w/ #8 grd.	1030	FT	0.08	72	22.66		0.85	\$1,630		\$860		\$2,590
D	23. Install power wire 3#500 w/ #1/0 grd.	3080	FT	0.20	734	22.66		8.18	\$16,630		\$27,560		\$44,190
D	24. Install wire term. 600v, 1/c #14	80	EA	0.20	19	22.66		0.20	\$430		\$20		\$450
D	24. Install wire term. 600v, 1/c #12	34	EA	0.20	8	22.66		0.25	\$180		\$10		\$190
D	25. Install wire term. 600v, 1/c #10	9	EA	0.30	3	22.66		0.90	\$70		\$10		\$80
D	26. Install wire term. 600v, 1/c #8	15	EA	0.40	7	22.66		1.00	\$160		\$20		\$180
D	27. Install wire term. 600v, 1/c #1	15	EA	0.40	7	22.66		1.30	\$160		\$20		\$180
D	28. Install wire term. 600v, 1/c #1/0	17	EA	0.50	10	22.66		2.45	\$230		\$50		\$280
D	29. Install wire term. 600v, 1/c #500	51	EA	1.10	67	22.66		4.30	\$1,520		\$240		\$1,760
D	30. Install mtr. cont. kit, 600V, #14-#10	9	EA	0.60	6	22.66		21.00	\$140		\$210		\$350
D	13. Miscellaneous and support material Equipment_No_82	1	LOT	92.00	109	22.66			\$2,470				\$2,470
D	1. Install 3/4" flex cond. w/ 2 connectors	33	LOT	0.8	31	22.66		12.00	\$700		\$430		\$1,130
D	4. Install starter & fused disc. switch	12	EA	2.50	36	22.66		150.00	\$820		\$1,970		\$2,790
D	Push button station	7	EA	2.30	19	22.66		120.00	\$430		\$820		\$1,350
D	5. Install 3/4" conduit galv. rigid stl.	12800	FT	0.08	1214	22.66		0.95	\$27,510		\$13,300		\$40,810
D	8. Install 3/4" "L" fig. w/cover & gasket	256	EA	1.00	304	22.66		9.90	\$6,890		\$2,770		\$9,660
D	11. Install 3/4" conduit union "UNY"	104	EA	0.80	89	22.66		7.90	\$2,240		\$900		\$3,140
D	14. Install 3/4" conduit seal "EYS"	36	EA	0.90	38	22.66		10.00	\$860		\$390		\$1,250
D	17. Install 3/4" conduit hub	36	EA	0.80	34	22.66		4.40	\$770		\$170		\$940
D	20. Install power wire 3#8 w/ #10 grd.	8400	FT	0.05	528	22.66		0.60	\$11,960		\$5,510		\$17,470
D	21. Install power wire 3#12 w/ #12 grd.	1880	FT	0.04	72	22.66		0.36	\$1,630		\$680		\$2,280
D	22. Install power wire 3#10 w/ #10 grd.	1880	FT	0.04	88	22.66		0.48	\$1,990		\$880		\$2,870
D	25. Install wire term. 600v, 1/c #12	32	EA	0.20	8	22.66		0.20	\$180		\$10		\$190
D	26. Install wire term. 600v, 1/c #10	72	EA	0.20	17	22.66		0.20	\$390		\$20		\$410
D	27. Install wire term. 600v, 1/c #8	120	EA	0.30	43	22.66		0.85	\$970		\$110		\$1,080
D	13. Miscellaneous and support material Equipment_No_83	1	LOT	260.00	308	22.66			\$6,980				\$6,980
D	1. Install 3/4" flex cond. w/ 2 connectors	5	LOT	0.8	5	22.66		12.00	\$110		\$70		\$180
D	2. Install starter & fused disc. switch	5	EA	2.50	15	22.66		150.00	\$340		\$820		\$1,160
D	3. Install 3/4" conduit galv. rigid stl.	2100	FT	0.08	199	22.66		0.95	\$4,510		\$2,160		\$6,690
D	4. Install 3/4" "L" fig. w/cover & gasket	42	EA	1.00	50	22.66		9.90	\$1,130		\$450		\$1,580
D	5. Install 3/4" conduit union "UNY"	20	EA	0.80	19	22.66		7.90	\$430		\$170		\$600
D	6. Install 3/4" conduit seal "EYS"	6	EA	0.90	6	22.66		10.00	\$140		\$70		\$210
D	7. Install 3/4" conduit hub	6	EA	0.80	6	22.66		4.40	\$140		\$30		\$170

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Rate	Total	Labor	SIC	Mat'l					
D	8. Install power wire 3#12 w/ #12 grd.	2280	FT	0.04	22.66	97			\$2,200		\$900		\$3,100	
D	9. Install wire term. 600v, 1/c #12	40	EA	0.20	22.66	9			\$200		\$10		\$210	
D	13. Miscellaneous and support material	1	LOT	42.00	22.66	50			\$1,130				\$1,130	
	<u>Sampling System</u>													
D	1. Install 3/4" flex cond. w/ 2 connectors	3	LOT	0.8	22.66	3			\$70		\$40		\$110	
D	2. Install starter & fused disc. switch	3	EA	2.50	22.66	9			\$200		\$480		\$680	
D	3. Install 3/4" conduit galv. rigid stl.	1200	FT	0.08	22.66	114			\$2,580		\$1,250		\$3,830	
D	4. Install 3/4" "L" ftg. w/cover & gasket	24	EA	1.00	22.66	28			\$630		\$260		\$890	
D	5. Install 3/4" conduit union "UNY"	9	EA	0.80	22.66	9			\$200		\$80		\$280	
D	6. Install 3/4" conduit seal "EYS"	3	EA	0.80	22.66	3			\$70		\$30		\$100	
D	7. Install 3/4" conduit hub	3	EA	0.80	22.66	7			\$160		\$10		\$170	
D	8. Install power wire 3#8 w/ #10 grd.	630	FT	0.05	22.66	40			\$910		\$410		\$1,320	
D	9. Install wire term. 600v, 1/c #10	15	EA	0.20	22.66	4			\$90		\$10		\$100	
D	9. Install wire term. 600v, 1/c #8	9	EA	0.25	22.66	3			\$70		\$10		\$80	
D	13. Miscellaneous and support material	1	LOT	24.00	22.66	28			\$630				\$630	
	<u>Equipment No..85</u>													
D	1. Install 3/4" conduit galv. rigid stl.	10400	FT	0.08	22.66	988			\$22,340		\$10,810		\$33,150	
D	2. Install 3/4" "L" ftg. w/cover & gasket	208	EA	1.00	22.66	247			\$5,600		\$2,250		\$7,850	
D	3. Install 3/4" conduit union "UNY"	116	EA	0.80	22.66	110			\$2,480		\$1,000		\$3,480	
D	4. Install 3/4" conduit seal "EYS"	116	EA	0.90	22.66	124			\$2,610		\$1,270		\$4,080	
D	5. Install 3/4" conduit hub	116	EA	0.80	22.66	110			\$2,480		\$560		\$3,050	
D	6. Install power wire 3#12 w/ #12 grd.	8000	FT	0.04	22.66	256			\$5,800		\$2,380		\$8,180	
D	Pan and tilt control wire 3#14	8000	FT	0.03	22.66	192			\$4,350		\$1,380		\$5,730	
D	Video co-axial cable	8000	FT	0.01	22.66	71			\$1,610		\$1,380		\$2,990	
D	7. Install wire term. 600v, 1/c #14	312	EA	0.20	22.66	74			\$1,680		\$70		\$1,750	
D	7. Install wire term. 600v, 1/c #12	416	EA	0.20	22.66	99			\$2,240		\$110		\$2,350	
D	9. Install wire term. 600v co-axial cable	104	EA	0.20	22.66	25			\$570		\$340		\$910	
D	13. Miscellaneous and support material	1	LOT	220.00	22.66	261			\$5,910				\$5,910	
	<u>Fire Detection & Alarm</u>													
D	1. Install manual smoke detectors	1	LOT	500.0	22.66	593			\$13,440		\$7,660		\$21,100	
	<u>Health Protection</u>													
D	1. Install flex cond. assy. for monitore	28	EA	1.1	22.66	38			\$660		\$440		\$1,100	
D	2. Install stn. stl. box (20" x 20" x 8")	2	EA	10.3	22.66	24			\$540		\$1,380		\$1,920	
D	3. Install 3/4" cond. galv. stl.	1450	FT	0.08	22.66	138			\$3,130		\$1,510		\$4,640	
D	4. Install 1" cond. galv. stl.	200	FT	0.11	22.66	26			\$590		\$320		\$910	

ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

Fluor Fernald, Inc.

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Equip	Mat'l					
D	5. Install 1-1/2" cond. galv. stl.	170	FT	0.14	28	22.86			\$630		\$430		\$1,060
D	6. Install 2" cond. galv. stl.	80	FT	0.17	16	22.86			\$360		\$270		\$630
D	7. Install 3/4" "L" ftg. w/cover & gasket	47	EA	1.00	56	22.86			\$1,270		\$510		\$1,780
D	8. Install 1" "L" ftg. w/cover & gasket	6	EA	1.20	9	22.86			\$200		\$100		\$300
D	9. Install 1-1/2" "L" ftg. w/cover & gasket	6	EA	2.00	14	22.86			\$320		\$180		\$500
D	10. Install 2" "L" ftg. w/cover & gasket	4	EA	2.50	12	22.86			\$270		\$180		\$450
D	11. Install 3/4" "T" ftg. w/cover & gasket	34	EA	1.20	48	22.86			\$1,090		\$420		\$1,510
D	Install 2"- conduit seal "EYS"	2	EA	1.60	4	22.86			\$90		\$70		\$160
D	12. Install 1" "T" ftg. w/cover & gasket	6	EA	1.50	11	22.86			\$250		\$110		\$360
D	13. Install 1-1/2" "T" ftg. w/cover & gasket	6	EA	2.50	18	22.86			\$410		\$200		\$610
D	14. Install 2" "T" ftg. w/cover & gasket	4	EA	3.00	14	22.86			\$320		\$200		\$520
D	15. Install 3/4" conduit union "UNY"	13	EA	0.80	12	22.86			\$270		\$110		\$380
D	16. Install 1" conduit union "UNY"	6	EA	1.00	7	22.86			\$160		\$90		\$250
D	17. Install 1-1/2" conduit union "UNY"	6	EA	1.50	11	22.86			\$250		\$180		\$430
D	18. Install 2" conduit union "UNY"	2	EA	1.90	5	22.86			\$110		\$80		\$190
D	19. Install 1/2" conduit drain	21	EA	0.20	5	22.86			\$110		\$570		\$680
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	3600	FT	0.02	77	22.86			\$1,740		\$910		\$2,650
D	21. Install 1pr-#16 wire termination, 300v	58	EA	0.40	28	22.86			\$630		\$20		\$650
D	23. Miscellaneous and support material	1	LOT	52.00	62	22.86			\$1,400		\$20		\$1,400
Power Wiring to Monitors & CAM's													
D	3/4" Galv rigid cond.	1350	FT	0.08	128	22.86			\$2,800		\$1,400		\$4,300
D	3/4" GRFX box	29	EA	2.20	76	22.86			\$1,720		\$1,040		\$2,760
D	3/4" "L" ftg with cover and gasket	43	EA	1.00	51	22.86			\$1,160		\$470		\$1,630
D	3/4" "T" ftg with cover and gasket	7	EA	1.20	10	22.86			\$230		\$90		\$320
D	3/4" Conduit union "UNY"	17	EA	0.80	16	22.86			\$360		\$150		\$510
D	3/4" Conduit hub	4	EA	0.80	4	22.86			\$90		\$20		\$110
D	3/4" Conduit seal "EYS"	4	EA	0.90	4	22.86			\$90		\$40		\$130
D	Power wire 2#12 w/ #12 grd	1950	FT	0.03	62	22.86			\$1,400		\$580		\$1,980
D	1/c #12 wite term	100	EA	0.20	24	22.86			\$540		\$30		\$570
D	13. Miscellaneous and support material	1	LOT	32.00	38	22.86			\$860		\$30		\$890
Distributed Control System													
D	1. Install 1-1/2" cond. galv. stl.	4000	FT	0.14	664	22.86			\$15,050		\$10,060		\$25,110
D	2. Install 2" cond. galv. stl.	8500	FT	0.17	1713	22.86			\$38,820		\$28,640		\$67,460
D	3. Install 1-1/2" "L" ftg. w/cover & gasket	120	FT	2.00	285	22.86			\$6,460		\$3,540		\$10,000
D	4. Install 2" "L" ftg. w/ cover & gasket	255	FT	2.50	756	22.86			\$17,130		\$11,720		\$28,850
D	5. Install 1-1/2" cond. union "UNY"	45	EA	1.50	80	22.86			\$1,810		\$1,310		\$3,120

FINAL ESTIMATE WORKSHEETS

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

Fluor Fernald, Inc.

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total		Lab	S/C	Mat'l					
D	6. Install 2" cond. union "UNY"	95	EA	1.90	214	22.66				\$4,850		\$3,580		\$8,430
D	7. Install 1-1/2" cond. seal "EYS"	8	EA	1.40	13	22.66			\$290		\$200			\$490
D	8. Install 2" cond. seal "EYS"	17	EA	1.80	32	22.66			\$730		\$560			\$1,290
D	9. Install 1-1/2" conduit hub	18	EA	1.50	28	22.66			\$630		\$140			\$770
D	10. Install 2" conduit hub	34	EA	1.90	77	22.66			\$1,740		\$410			\$2,150
D	11. Install power wire 600v, 1/c #12	4180	FT	0.04	178	22.66			\$4,030		\$5,460			\$9,490
D	13. Install wire term. 600v, 1/c #12	1008	EA	0.40	478	22.66			\$10,830		\$330			\$11,160
D	13. Install wire term. 600v, 1/c #12	8840	EA	0.08	576	22.66			\$13,050		\$20,310			\$33,360
D	13. Miscellaneous and support material Radon_Control System.	1	LOT	518.00	612	22.66			\$13,870					\$13,870
D	1. Install instrument flex cond. assy.	1	EA	1.10	1	22.66			\$20		\$20			\$40
D	2. Install 3/4" cond. galv. stl.	100	FT	0.08	9	22.66			\$200		\$100			\$300
D	3. Install 3/4" "L" ftg. w/ cover & gasket	4	EA	1.00	5	22.66			\$110		\$40			\$150
D	4. Install 3/4" "T" ftg. w/ cover & gasket	1	EA	1.20	1	22.66			\$20		\$10			\$30
D	5. Install 3/4" cond. hub	1	EA	0.80	1	22.66			\$20		\$20			\$40
D	6. Install 3/4" cond. union "EYS"	1	EA	0.90	1	22.66			\$20		\$10			\$30
D	7. Install 3/4" cond. union "UNY"	1	EA	0.80	1	22.66			\$20		\$10			\$30
D	8. Install 1/2" cond. drain	4	EA	0.20	1	22.66			\$20		\$110			\$130
D	9. Install 1pr#16 str. cu/ pvcjkt., 300v	120	FT	0.02	3	22.66			\$70		\$30			\$100
D	10. Install 1pr#16 wire termination, 300v	2	EA	0.40	1	22.66			\$20		\$20			\$40
D	Freight @ 2.5 %											\$18,814		
Subtotal Direct Cost											\$ 1,118,310	\$ 708,710	\$ 771,354	\$ 2,598,374
Subtotal Indirect Cost														

ITEM NO.	UUU - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
2														
	A. RECEIVING & LAYDOWN AREAS													
	1. for EQUIPMENT - 150' x 150' x 1'													
D	i. Subgrade Pavement Base	2,500	SY	0.016	47	21.49			\$1,010		\$20,130		\$1,010	
D	ii. Base Course, 12" deep	2,500	SY	0.017	50	21.49	8.05		\$1,070		\$6,130		\$21,200	
D	iii. Stabilization Fabric, 6 oz.	2,500	SY	0.030	89	21.49	2.45		\$1,910		\$3,650		\$8,040	
D	iv. Penetration crushed stone, 4" thick	2,500	SY	0.020	59	21.49	1.46		\$1,270				\$4,920	
	2. extension of utilities													
D	i. Tie-in water supply	1	LS	80.00	95	21.49	500.00		\$2,040		\$500		\$2,540	
D	ii. Tie-in electrical system	1	LS	80.00	95	21.49	500.00		\$2,040		\$500		\$2,540	
D	iii. Subgrade pavement base	225	SY	0.016	4	21.49	2.45		\$90		\$550		\$640	
D	iv. Base Course 12" deep	225	SY	0.017	5	21.49	1.46		\$110		\$330		\$440	
	B. RELOCATE EXISTING ITEMS													
D	i. Subgrade Pavement Base	1,000	SY	0.016	19	21.49			\$410				\$410	
D	ii. Base Course, 12" deep	1,000	SY	0.017	20	21.49	8.05		\$430		\$8,050		\$8,480	
D	iii. Stabilization Fabric, 6 oz.	1,000	SY	0.003	4	21.49	2.45		\$90		\$2,450		\$2,540	
D	iv. Penetration crushed stone, 4" thick	1,000	SY	0.002	2	21.49	1.46		\$40		\$1,460		\$1,500	
D	- Site Preparation	1	LS	120.0	142	21.49			\$3,050				\$3,050	
D	- Facility Construction	1	LS	120.0	142	21.49			\$3,050				\$3,050	
	C. STORMWATER MANAGEMENT													
	1. WASTE PREP BLDG.													
mC	i. Excav. footings, Piers, gradebeams	234	BCY	0.25	114	21.49			\$2,450				\$2,450	
mC	ii. Backfill footings, Piers, gradebeams	409	ICY	0.22	175	21.49			\$3,770				\$3,770	
D	iii. Heaf excess to stockpile	156	LCY	0.48	146	21.49			\$3,140				\$3,140	
mC	iv. Excav. Interior Wall footings	120	BCY	0.33	77	21.49			\$1,860				\$1,860	
mC	v. Backfill Interior Wall Footings	87	ICY	0.37	63	21.49			\$1,350				\$1,350	
D	vi. Heaf excess to stockpile	50	LCY	1.14	111	21.49			\$2,390				\$2,390	
	Take-off Allowance													
	Subtotal Direct Cost	1	LOT		1,459	\$21.49			\$31,370		\$43,750		\$75,120	

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline) **DATE:** 16-May-01
ESTIMATE NO.: C4-2001-05-002 **ESTIMATOR:** Johnson
CLIENT: DOE **LOCATION:** FORMALD
WBS NO.: 1.1.H.D **TASK NO.:** H8D12

	PERCENT OF INFLUENCE ON CHART MANHOURS										WT'D VALUE	PROD. RESULT
	40%	50%	60%	70%	80%	80%	100%	105%	110%	% OF INFLUENCE		
CRAFT SKILL (NOTE 1)	POOR			FAIR			STD			EXCELLENT	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			V.GOOD	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85				20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT				5.0%	0.05
WORK SPACE				200 SF	250 SF		300 SF			350 SF	10.0%	0.1
WORK WEEK							4-10a / 5-8a				15.0%	0.15
50 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS		UP TO 3 WEEKS				0.0%	0
60 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS		UP TO 3 WEEKS				0.0%	0
SHIFTWORK											3.0%	0.03
2ND SHIFT					2ND SHIFT		OR ONE SHIFT ONLY				5.0%	0.05
3RD SHIFT					3RD SHIFT						4.0%	0.042
PROJECT SIZE							200M TO 300M MH			200M MH OR LESS	8.0%	0.072
PLANT TYPE							GRASS ROOTS				10.0%	0.04
AREA/JUNCTION INFLUENCE	STRONG		MILD		SOME		NONE				100.0%	87.4%

NOTES:
 1. TURNOVER HAS BEEN CONSIDERED
 2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) **87.4%**
 MULTIPLIER (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) **1.14**

EFFICIENCY FACTORS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

PPE MULTIPLIER DEVELOPMENT

	D	mC	C	C +	B
CREW SIZE & MAKE-UP	7	7	7	7	7
STANDARD WORKER-BUDDY SUPPORT TEAM					3
TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO	1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR	0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR	1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO	0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER	1.04	1.71	1.79	2.47	4.26

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Salg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDITIONAL SITE SAFETY MEETINGS NOT INCLD. IN BASE MINS	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY		4	4	4	4
	MINUTES		15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	3
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	45
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS)	QUANTITY	N/A	4	4	8	8
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL					40	40
AVAILABLE WORK TIME		575	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

EFFICIENCY FACTORS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

PPE MULTIPLIER DEVELOPEMENT

	D	mC	C	C +	B
CREW SIZE & MAKE-UP					
STANDARD	7	7	7	7	7
WORKER-BUDDY					
SUPPORT TEAM					3
TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO	1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR	0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR	1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO	0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER	1.04	1.71	1.79	2.47	4.28

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of "Hazardous Waste Cost Control" by R.A.Salg.
 Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C.
 The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADJTN'L SITE SAFETY MEETINGS NOT INCLD. IN BASE MF's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY		4	4	4	4
	MINUTES		15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	3
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	45
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS)	QUANTITY	N/A	4	4	8	8
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL					40	40
AVAILABLE WORK TIME		575	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust "Work Minutes per Day" basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

HEALTH PHYSICS

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)

ESTIMATE NO.: CA-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

CAPITAL PLANT

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY		
			ed in PPE's Div. by WORK HOURS / DAY)		
		\$s	MAN DAYS	MAT'L \$s	LEVEL
C+ / B : F/HF MASK w/RESP.&CART.					
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.48	4		C/C+/B
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.48	4		C/C+/B
GLOVE LINER - DISPOSABLE	PR	0.24	4		C/C+/B
GLOVE, LATEX - DISPOSABLE	PR	0.26	4		C/C+/B
GLOVE, WORK - DISPOSABLE	PR	1.02	4		C/C+/B
APR CARTRIDGES - DISPOSABLE	PR	11.74	4		C/C+/B
SUB-TOTAL		22.18	4		

(DOUBLE PPE)

\$MD =

PPE LEVEL mC					
DESCRIPTION	UNIT	\$s	MAN DAYS	MAT'L \$s	LEVEL
ULL DRESS w/ FACE SHIELD					
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.48	4	\$448	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	\$24	mC
GLOVE, LATEX - DISPOSABLE	PR	0.26	4	\$26	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	\$102	mC
SUB-TOTAL		5.98	4	\$598	

\$MD =

SUBCONTRACTOR REQUIRED PURCHASES	UNIT	QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	8		D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	8		C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	8		C
SCBA	EA	1894.00	2		B
COOL VESTS	EA	137.50	8		C/B
THERMO STRIPS	EA	50.00	8		C/B
SUB-TOTAL					

MAT'L \$s

\$800

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

**-MEDICAL MONITORING -
 CAPITAL - PLANT**

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	219	876	\$22.01	\$19,280
ANNUAL PHYSICALS	1	4	219	876	\$22.01	\$19,280
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	219	219	\$22.01	\$4,820
SUB-TOTAL						\$43,380

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	6	1	219	1318	\$22.01	\$29,020
SUB-TOTAL						\$29,020

RANDOM DRUG TESTING

WKR	TESTS	HRS	LABOR \$'s			
3	230	2	480	\$22.01	\$10,100	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
850	228	3	0.004615385	219	1.010789231	228

LABOR \$'s THRU SAFETY	LABOR \$'s
------------------------	------------

WORK DELAYS CAUSED BY MONITORING		\$7,570,800	
WORK DELAYS CAUSED BY RAD CHECKING	0.3%	\$7,570,800	\$18,900

TOTAL LABOR	TOTAL MAT'L	GRAND TOTAL
\$101,400	\$800	\$102,200

TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET

S:\ESTIMATE\eper\2001 Site estimate\Chemical Site 1&2\Chemical stabilization 2001.xls\H1rh.phys

ACTIVITY DURATIONS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline)
 ESTIMATE NO.: C4-2001-05-002
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSD12

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	01-May-01	01-Jan-02	03-Jul-02	02-Jan-03	12.0	MONTHS
						MONTHS
TOTAL					12.0	MONTHS

DATE of EST. to MID-POINT CTIVITY DURATION	
a.	1215.6 MONTHS
b.	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS		01-Jan-02	03-Jul-03	01-Jan-05	36.1	MONTHS
					36.1	MONTHS

DATE of EST. to MID-POINT CTIVITY DURATION	
	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

HS1AB

DESIGN DATA DEVELOPMENT

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: H51A
CHARGE NO: H51AB
COMMENT#: F07-014, F07-017

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

DESIGN DATA DEVELOPMENT
F07-014, F07-017

Resource:	ENGPCR	ENG PROCESS/STARTUP	Class:	EOC:	LABOR						
Res Dept:	943	Overtime:		SAL							
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		312.1 312.1	0.0 312.1								
Yr Total Cost:		17,472	0	0	0	0	0	0	0	0	0
Cum Total Cost:		17,472	17,472	17,472	17,472	17,472	17,472	17,472	17,472	17,472	17,472

Resource:	LABMGR	LAB MANAGER	Class:	EOC:	LABOR						
Res Dept:	943	Overtime:		SAL							
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		33.6 1,716	0.0 33.6								
Yr Total Cost:		1,716	0	0	0	0	0	0	0	0	0
Cum Total Cost:		1,716	1,716	1,716	1,716	1,716	1,716	1,716	1,716	1,716	1,716

Resource:	LABTEC	LAB TECH	Class:	EOC:	LABOR						
Res Dept:	943	Overtime:		SAL							
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:		873.0 24,261	236.3 6,912	1,109.3 31,173							
Yr Total Cost:		24,261	6,912	31,173	31,173	31,173	31,173	31,173	31,173	31,173	31,173
Cum Total Cost:		24,261	31,173	31,173	31,173	31,173	31,173	31,173	31,173	31,173	31,173

Resource:	MAT300	MATERIAL OBJCLASS300	Class:	EOC:	MATERIAL						
Res Dept:	943	Overtime:		MAT							
Yr Units:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Units:		38,923.8 38,923.8	33,413.1 72,336.9	0.0 72,336.9							
Yr Total Cost:		38,924	34,315	0	0	0	0	0	0	0	0
Cum Total Cost:		38,924	73,239	73,239	73,239	73,239	73,239	73,239	73,239	73,239	73,239

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 11HD
CTRL ACCT: HS1A
CHARGE NO: HS1AB
COMMENT# F07-014, F07-017
DESIGN DATA DEVELOPMENT

Resource:	Res Dept:	ODC700 943	Class:	ODC															
				Yr	Cum														
Yr Units:				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:				5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0	5,000.0
Yr Total Cost:				5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Cum Total Cost:				5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000

Resource:	Res Dept:	RADTEC 943	Class:	LABOR															
				Yr	Cum														
Yr Hours:				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1
Yr Total Cost:				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:				1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503	1,503

Resource:	Res Dept:	S&HTEC 943	Class:	LABOR															
				Yr	Cum														
Yr Hours:				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6	33.6
Yr Total Cost:				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:				971	971	971	971	971	971	971	971	971	971	971	971	971	971	971	971

Resource:	Res Dept:	SERVSUB 943	Class:	SUBCONTRACTORS															
				Yr	Cum														
Yr Units:				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:				263,587.5	263,587.5	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0
Yr Total Cost:				270,704	270,704	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117
Cum Total Cost:				304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117

Resource:	Res Dept:	TPSREP 943	Class:	TECH/PROG SUPT REP		TECH/PROG SUPT REP		TECH/PROG SUPT REP		TECH/PROG SUPT REP		TECH/PROG SUPT REP		TECH/PROG SUPT REP		TECH/PROG SUPT REP		TECH/PROG SUPT REP	
				Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum
Yr Units:				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:				33,412.5	33,412.5	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0	297,000.0
Yr Total Cost:				33,413	33,413	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117
Cum Total Cost:				33,413	33,413	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117	304,117

Fluor Fernald, Inc.

PBS: OHFN07
 WBS: 1.1.H.D
 CTRL ACCT: H51A
 CHARGE NO: H51AB
 COMMENT#: F07-014, F07-017

DATE: 09/05/01
 PROJECT MGR: R. FELLMAN
 CAM: R. FELLMAN
 PREPARED BY: J. NORTH
 FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
 FOR ACTIVITY BASED ESTIMATING
 (1 FTE EQUALS 1747 HOURS)

DESIGN DATA DEVELOPMENT

	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:	720.7	258.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	720.7	979.6	979.6	979.6	979.6	979.6	979.6	979.6	979.6	979.6
Yr Total Cost:	37,447	14,159	0	0	0	0	0	0	0	0
Cum Total Cost:	37,447	51,606	51,606	51,606	51,606	51,606	51,606	51,606	51,606	51,606

GRAND TOTALS:

	Oct 00-	Sep 01-	Sep 02-	Sep 03-	Sep 04-	Sep 05-	Sep 06-	Sep 07-	Sep 08-	Sep 09-	Sep 10
Yr Hours:	2,017.1	495.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	2,017.1	2,512.2	2,512.2	2,512.2	2,512.2	2,512.2	2,512.2	2,512.2	2,512.2	2,512.2	2,512.2
Yr Total Cost:	160,706	326,091	486,797	486,797	486,797	486,797	486,797	486,797	486,797	486,797	486,797
Cum Total Cost:	160,706	486,797	486,797	486,797	486,797	486,797	486,797	486,797	486,797	486,797	486,797

Robert Fellman

Robert Fellman

CONTROL TEAM

HS1AC

DESIGN/DESIGN OVERSIGHT

Fluor Fernald, Inc.

PBS: OHFN07 DATE: 09/05/01
 WBS: 1.1.H.D PROJECT MGR: R. FELLMAN
 CTRL ACCT: HS1A CAM: R. FELLMAN
 CHARGE NO: HS1AC DESIGN/DESIGN OVERSIGHT PREPARED BY: T.J.STONE
 COMMENT#: F07-001,F07-035,F07-053,F07-061 FISCAL YEAR: 2001-2008

Resource: ENGCVL ENGINEER CIVIL (1 FTE EQUALS 1747 HOURS)

Res Dept:	943	Class:	LABOR											
			EOC:	SAL	EOC:	SAL								
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			261.2	87.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Yr Total Cost:			14,206	348.9	348.9	348.9	348.9	348.9	348.9	348.9	348.9	348.9		
Cum Total Cost:			14,206	19,226	19,226	19,226	19,226	19,226	19,226	19,226	19,226	19,226		

Resource: ENGNR ENGINEER LABOR

Res Dept:	943	Class:	LABOR											
			EOC:	SAL	EOC:	SAL								
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			2,003.0	514.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Yr Total Cost:			137,728	2,517.7	2,517.7	2,517.7	2,517.7	2,517.7	2,517.7	2,517.7	2,517.7	2,517.7		
Cum Total Cost:			137,728	174,979	174,979	174,979	174,979	174,979	174,979	174,979	174,979	174,979		

Resource: ENGPRC ENG PROCESS/STARTUP LABOR

Res Dept:	943	Class:	LABOR											
			EOC:	SAL	EOC:	SAL								
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			476.3	133.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Yr Total Cost:			26,664	609.6	609.6	609.6	609.6	609.6	609.6	609.6	609.6	609.6		
Cum Total Cost:			26,664	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518	34,518		

Resource: ODCTRLV TRAVEL RESOURCE ODC

Res Dept:	943	Class:	ODC											
			EOC:	ODC	EOC:	ODC								
Yr Units:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Units:			29,925.0	4,275.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Yr Total Cost:			29,925.0	34,200.0	34,200.0	34,200.0	34,200.0	34,200.0	34,200.0	34,200.0	34,200.0	34,200.0		
Cum Total Cost:			29,925.0	34,315	34,315	34,315	34,315	34,315	34,315	34,315	34,315	34,315		

Resource: TPHO TEAM PARTNER HOME OF LABOR

Res Dept:	943	Class:	LABOR											
			EOC:	TP	EOC:	TP								
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			1,331.3	964.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Yr Total Cost:			128,670	2,296.0	2,296.0	2,296.0	2,296.0	2,296.0	2,296.0	2,296.0	2,296.0	2,296.0		
Cum Total Cost:			128,670	226,811	226,811	226,811	226,811	226,811	226,811	226,811	226,811	226,811		

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: T.J. STONE
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AC DESIGN/DESIGN OVERSIGHT
COMMENT# F07-001,F07-035,F07-053,F07-061

Resource:	Res Dept:	TPSREP	943	TECH/PROG SUPT REP	Class:	EOC:		LABOR	
						SAL	SAL		
Yr Hours:		987.3		519.2		0.0	0.0	0.0	0.0
Cum Hours:		1,516.5		1,516.5		1,516.5	1,516.5	1,516.5	1,516.5
Yr Total Cost:		51,820		28,396		0	0	0	0
Cum Total Cost:		51,820		80,217		80,217	80,217	80,217	80,217

Resource:	Res Dept:	WSTENG	943	WASTE ENGINEER	Class:	EOC:		LABOR	
						SAL	SAL		
Yr Hours:		877.0		877.0		0.0	0.0	0.0	0.0
Cum Hours:		877.0		877.0		877.0	877.0	877.0	877.0
Yr Total Cost:		47,106		47,106		0	0	0	0
Cum Total Cost:		47,106		47,106		47,106	47,106	47,106	47,106

Resource:	Res Dept:	WSTNGR	943	WASTE ENGINEER MGR	Class:	EOC:		LABOR	
						SAL	SAL		
Yr Hours:		438.5		438.5		0.0	0.0	0.0	0.0
Cum Hours:		438.5		438.5		438.5	438.5	438.5	438.5
Yr Total Cost:		25,395		25,395		0	0	0	0
Cum Total Cost:		25,395		25,395		25,395	25,395	25,395	25,395

GRAND TOTALS:									
Yr Hours:		1,862.8		1,862.8		1,862.8	1,862.8	1,862.8	1,862.8
Cum Hours:		1,862.8		1,862.8		1,862.8	1,862.8	1,862.8	1,862.8
Yr Total Cost:		104,516		104,516		104,516	104,516	104,516	104,516
Cum Total Cost:		104,516		104,516		104,516	104,516	104,516	104,516

CAM *Robert Fellman*

CONTROL TEAM *Howard Pickens*

HS1AD

CONSTRUCTION MANAGEMENT

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1 HD
CTRL ACCT: HS1A
CHARGE NO: HSIAD
COMMENT# F07-031, F07-047, F07-061
Resource: CNSCOD
Res Dept: 943

CONSTRUCTION COORD
Overtime: 0

Yr Hours	LABOR											
	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
0.0	0.0	0.0	3,275.6	3,624.5	7,783.1	7,783.1	7,783.1	7,783.1	7,783.1	7,783.1	0.0	0.0
0.0	0.0	883.0	4,158.6	7,783.1	7,783.1	7,783.1	7,783.1	7,783.1	7,783.1	7,783.1	0.0	0.0
0	0	31,246	122,747	143,873	297,866	297,866	297,866	297,866	297,866	297,866	0	0
0	0	31,246	153,993	297,866	297,866	297,866	297,866	297,866	297,866	297,866	0	0
Cum Total Cost:												
Cum Total Cost:												

CONSTRUCTION ENG
Overtime: 0

Yr Hours	LABOR											
	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
0.0	0.0	0.0	2,639.5	5,520.6	9,170.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	2,639.5	8,160.1	17,330.8	17,330.8	17,330.8	17,330.8	17,330.8	17,330.8	17,330.8	0.0	0.0
0	0	160,380	355,215	625,061	1,140,657	1,140,657	1,140,657	1,140,657	1,140,657	1,140,657	0	0
0	0	160,380	515,596	1,140,657	1,140,657	1,140,657	1,140,657	1,140,657	1,140,657	1,140,657	0	0
Cum Total Cost:												
Cum Total Cost:												

ENGINEER MECH/PIPING
Overtime: 0

Yr Hours	LABOR											
	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
0.0	0.0	353.6	349.4	1,146.7	1,599.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	353.6	703.0	1,849.7	3,449.1	3,449.1	3,449.1	3,449.1	3,449.1	3,449.1	0.0	0.0
0	0	23,143	24,222	84,181	124,374	0	0	0	0	0	0	0
0	0	23,143	47,365	131,546	255,920	255,920	255,920	255,920	255,920	255,920	0	0
Cum Total Cost:												
Cum Total Cost:												

ENGINEERING MGR
Overtime: 0

Yr Hours	LABOR											
	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
0.0	0.0	1,747.0	1,747.0	1,848.3	904.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	1,747.0	3,494.0	5,342.3	6,246.5	6,246.5	6,246.5	6,246.5	6,246.5	6,246.5	0.0	0.0
0	0	109,964	116,474	130,493	67,622	0	0	0	0	0	0	0
0	0	109,964	226,437	356,930	424,552	424,552	424,552	424,552	424,552	424,552	0	0
Cum Total Cost:												
Cum Total Cost:												

MATERIAL OBJCLASS300
Overtime: 0

Yr Hours	MATERIAL											
	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:												
Cum Total Cost:												

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.HID
CTRL ACCT: HS1A
CHARGE NO: HSIAD CONSTRUCTION MANAGEMENT
COMMENT# F07-031, F07-047, F07-061

Resource:	S&HENG	SAFETY ENGINEER	LABOR											
			Class:		EOC:		SAL		Class:		EOC:		SAL	
Res Dept:	943	Overtime:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	Oct 09- Sep 10	
Yr Hours:			0.0	0.0	1,967.5	4,740.0	7,139.1	7,139.1	7,139.1	7,139.1	7,139.1	7,139.1	7,139.1	
Cum Hours:			0.0	0.0	1,967.5	4,740.0	7,139.1	7,139.1	7,139.1	7,139.1	7,139.1	7,139.1	7,139.1	
Yr Total Cost:			0	0	109,041	162,712	149,147	0	0	0	0	0	0	
Cum Total Cost:			0	0	109,041	271,754	420,901	420,901	420,901	420,901	420,901	420,901	420,901	

Resource:	WSTENG	WASTE ENGINEER	LABOR											
			Class:		EOC:		SAL		Class:		EOC:		SAL	
Res Dept:	943	Overtime:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	Oct 09- Sep 10	
Yr Hours:			0.0	0.0	441.0	1,848.3	1,599.4	0.0	0.0	0.0	0.0	0.0	0.0	
Cum Hours:			0.0	0.0	441.0	2,289.3	3,888.7	3,888.7	3,888.7	3,888.7	3,888.7	3,888.7	3,888.7	
Yr Total Cost:			0	0	25,090	111,355	102,072	0	0	0	0	0	0	
Cum Total Cost:			0	0	25,090	136,445	238,517	238,517	238,517	238,517	238,517	238,517	238,517	

Resource:	WSTMGR	WASTE ENGINEER MGR	LABOR											
			Class:		EOC:		SAL		Class:		EOC:		SAL	
Res Dept:	943	Overtime:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10	Oct 09- Sep 10	
Yr Hours:			0.0	0.0	0.0	924.2	799.7	0.0	0.0	0.0	0.0	0.0	0.0	
Cum Hours:			0.0	0.0	0.0	924.2	1,723.9	1,723.9	1,723.9	1,723.9	1,723.9	1,723.9	1,723.9	
Yr Total Cost:			0	0	0	60,031	55,026	0	0	0	0	0	0	
Cum Total Cost:			0	0	0	60,031	115,057	115,057	115,057	115,057	115,057	115,057	115,057	

GRAND TOTALS:													
Yr Hours:	Yr Total Cost:	Cum Hours:	Cum Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
0.0	0	0.0	0	0.0	0.0	9,351.4	27,678.2	30,888.0	0.0	0.0	0.0	0.0	0.0
0.0	0	0.0	0	2,100.6	11,452.0	39,130.2	70,018.2	70,018.2	70,018.2	70,018.2	70,018.2	70,018.2	70,018.2
0	0	0	0	133,107	524,849	1,473,026	1,756,567	3,887,548	3,887,548	3,887,548	3,887,548	3,887,548	3,887,548
0	0	0	0	133,107	657,955	2,130,982	3,887,548	3,887,548	3,887,548	3,887,548	3,887,548	3,887,548	3,887,548

CAM: *Robert Fellman* CONTROL TEAM: *Robert Fellman*

HS1AE

CONCEPTUAL DESIGN - JACOBS

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AE
COMMENT#: F07-001, F07-035, F07-061

CONCEPTUAL DESIGN PACKAGE (CDP) - JACOBS

Resource: Res Dept:	SERVSUB 943	SUBS Overtime:	JEG	Class:	EOC:		SUBCONTRACTORS			
					SUB	SUB				
Yr Units:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Units:	1,173,610.0	539,669.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	1,173,610.0	1,713,279.0	1,713,279.0	1,713,279.0	1,713,279.0	1,713,279.0	1,713,279.0	1,713,279.0	1,713,279.0	1,713,279.0
Cum Total Cost:	1,173,610	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850
GRAND TOTALS:										
Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Total Cost:	1,173,610	554,240	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850	1,727,850

CAM: Robert Fellman

CONTROL TEAM: Stephen Roberts

HS1AF

CONSTRUCTION SUBS MISC

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R FELLMAN
CAM: R FELLMAN
PREPARED BY: J NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AF
COMMENT#: FD7-005,FD7-061
CONSTRUCTION SUB - MISC

Resource:	FIELD SUBS	Class:		EOC:		SUBCONTRACTORS											
		943	Overtime:	SUB	SUB	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-		
Yr Units	0.0	1,027,588.7	2,618,201.0	1,491,440.3	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0		
Cum Units:	0.0	1,027,588.7	3,645,789.7	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0	5,137,230.0		
Yr Total Cost	0	1,055,334	2,761,493	1,617,111	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937		
Cum Total Cost:	0	1,055,334	3,816,826	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937		

GRAND TOTALS:

Yr Total Cost	Cum Total Cost:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
		0	1,055,334	2,761,493	3,816,826	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937	5,433,937

CAM: *Robert Fellman*

CONTROL TEAM: *Harold Weeks*

HS1AG

CONSTRUCTION ELECTRICAL

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R FELLMAN
CAM: R FELLMAN
PREPARED BY: J NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)
SUBCONTRACTORS

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AG CONSTRUCTION ELECTRICAL
COMMENT#:
Resource: FIELD SUB
Res Dept: 943
FIELD SUBS
Overtime:

	FIELD SUBS		Class:		EOC:		SUB			
	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Units	0.0	0.0	0.0	3,405,464.3	4,576,092.7	0.0	0.0	0.0	0.0	0.0
Cum Units	0.0	0.0	0.0	3,405,464.3	7,981,557.0	7,981,557.0	7,981,557.0	7,981,557.0	7,981,557.0	7,981,557.0
Yr Total Cost	0	0	0	3,692,414	5,100,608	0	0	0	0	0
Cum Total Cost	0	0	0	3,692,414	8,793,021	8,793,021	8,793,021	8,793,021	8,793,021	8,793,021
GRAND TOTALS:										
Yr Total Cost	0	0	0	3,692,414	5,100,608	0	0	0	0	0
Cum Total Cost	0	0	0	3,692,414	8,793,021	8,793,021	8,793,021	8,793,021	8,793,021	8,793,021

CAM: *Robert Fellman*

CONTROL TEAM: *Harvey Rubel*

HS1AH

CONSTRUCTION MECHANICAL

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

CHARGE NO: HS1AH CONSTRUCTION MECHANICAL

(1 FTE EQUALS 1747 HOURS)

SUBCONTRACTORS

EOC: SUB

Resource: Res Dept:	FIELD SUB 943	FIELD SUBS OverTime:	Class:		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-			
			Sub	Sub	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Units:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTALS:																								
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAM: *Robert Fellman*
CONTROL TEAM: *Harold Steed*

HS1AJ

CONSTRUCTION CIVIL

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R FELLMAN
CAM: R FELLMAN
PREPARED BY: J NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

SUBCONTRACTORS

EOC: SUB

Class:

FIELD SUBS
OverTime:

Resource: FIELDSUB
Res Dept: 943

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Total Cost																		
Yr Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTALS:																				
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAM: Robert Fellman CONTROL TEAM: Angela Roberts

HS1AK

STARTUP/READINESS

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: H51A
CHARGE NO: H51AK
COMMENT#: STARTUP/READINESS

Resource:	Res Dept:	QA/QC TECH	LABOR																				
			EOC:		SAL		Class:		EOC:		SAL		Class:										
QA ENGINEER	943	Overtime:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:			0.0	0.0	0.0	1,326.0	1,747.0	1,043.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,747.0	1,043.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	0.0	1,326.0	3,073.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0	4,116.0
Yr Total Cost:			0	0	0	71,951	100,414	64,050	0	0	0	0	0	0	0	0	100,414	64,050	0	0	0	0	0
Cum Total Cost:			0	0	0	71,951	172,365	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415	236,415

Resource:	Res Dept:	QA/QC TECH	LABOR																				
			EOC:		SAL		Class:		EOC:		SAL		Class:										
S&H ENG	943	Overtime:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:			0.0	0.0	372.0	1,747.0	1,747.0	1,043.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,747.0	1,043.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	372.0	2,119.0	3,866.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0	4,909.0
Yr Total Cost:			0	0	12,807	63,692	67,467	43,034	0	0	0	0	0	0	0	0	67,467	43,034	0	0	0	0	0
Cum Total Cost:			0	0	12,807	76,499	143,966	187,001	187,001	187,001	187,001	187,001	187,001	187,001	187,001	187,001	143,966	187,001	187,001	187,001	187,001	187,001	187,001

Resource:	Res Dept:	SAFETY ENGINEER	LABOR																				
			EOC:		SAL		Class:		EOC:		SAL		Class:										
S&H ENG	943	Overtime:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:			0.0	0.0	220.5	873.5	873.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	873.5	873.5	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	220.5	1,094.0	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5	1,967.5
Yr Total Cost:			0	0	12,220	51,265	54,304	0	0	0	0	0	0	0	0	54,304	54,304	0	0	0	0	0	0
Cum Total Cost:			0	0	12,220	63,485	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789	117,789

Resource:	Res Dept:	SUBS	SUBCONTRACTORS																				
			EOC:		SAL		Class:		EOC:		SAL		Class:										
S&H ENG	943	Overtime:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AK
COMMENT#: STARTUP/READINESS

Yr Units:	0.0	0.0	74,089.7	172,190.0	171,504.0	102,216.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	74,089.7	246,279.7	417,783.6	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0	520,000.0
Yr Total Cost:	0	0	78,145	186,689	191,162	117,237	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	78,145	264,844	456,005	573,242	573,242	573,242	573,242	573,242	573,242	573,242	573,242	573,242	573,242	573,242	573,242

Resource:	TPSREP	TECH/PROG SUPT REP	Overtime:	EOC:		LABOR													
				Class:	SAL														
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GRAND TOTALS:

Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CAM: *Robert Fellman* [Redacted] CONTROL TEAM: *George Parkes*

HS1AL

OPERATIONS & MAINTENANCE

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
[REDACTED]
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AL OPERATIONS & MAINTENANCE
COMMENT#: F07-040.F07-061

Resource: Res Dept:	CHEMICAL OPERATOR		LABOR		EOC:		HOU	
	CHMOPR	943	Class:	Class:	EOC:	HOU	Class:	Class:
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0

Resource: Res Dept:	CLERKS		LABOR		EOC:		SAL	
	CLERKS	943	Class:	Class:	EOC:	SAL	Class:	Class:
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0

Resource: Res Dept:	CLERKS		LABOR		EOC:		SAL	
	CLERKS	943	Class:	Class:	EOC:	SAL	Class:	Class:
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0

Resource: Res Dept:	DEPT ADMINISTRATOR		LABOR		EOC:		SAL	
	DEPADM	943	Class:	Class:	EOC:	SAL	Class:	Class:
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AL OPERATIONS & MAINTENANCE
COMMENT#: F07-040,F07-061
ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

Resource:	Res Dept:	INDHYG	INDUSTRIAL HYGIENIST																			
			LABOR																			
		Overtime:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
			Yr	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19
Yr Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource:	Res Dept:	INSMEC	INSTRUMENT MECHANIC																			
			LABOR																			
		Overtime:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
			Yr	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19
Yr Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource:	Res Dept:	LABCHM	CHEMIST																			
			LABOR																			
		Overtime:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
			Yr	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19
Yr Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource:	Res Dept:	MAT300	MATERIAL OBJCLASS300																			
			MATERIAL																			
		Overtime:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
			Yr	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19
Yr Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AL OPERATIONS & MAINTENANCE
COMMENT#: F07-040,F07-061

Yr Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MCHNST MACHINIST EOC: LABOR
Res Dept: 943 Overtime: HOU

Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MILLWRT MILLWRIGHT EOC: LABOR
Res Dept: 943 Overtime: HOU

Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MNTMGR MAINTENANCE MGR EOC: SAL
Res Dept: 943 Overtime: SAL

Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY-BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
C/M: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AL
COMMENT#: F07-040,F07-061
OPERATIONS & MAINTENANCE

Resource:	MNTREP	LABOR																				
		MAINTENANCE REP		Overtime:		Class:		EOC:		SAL												
Res Dept:	943	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:		0.0	0.0	372.0	367.0	797.7	5,358.4	2,763.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:		0.0	0.0	372.0	739.0	1,536.7	6,895.1	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0	9,659.0
Yr Total Cost:		0	0	14,412	15,057	36,279	259,121	145,571	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	14,412	29,469	65,748	324,868	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439	470,439

Resource:	ODC700	ODC																				
		Overtime:		Class:		EOC:		ODC														
Res Dept:	943	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Units:		0.0	0.0	0.0	0.0	0.0	6,145.1	9,372.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:		0.0	0.0	0.0	0.0	0.0	6,145.1	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0	15,518.0
Yr Total Cost:		0	0	0	0	0	7,048	11,062	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	0	7,048	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110	18,110

Resource:	OILERM	LABOR																				
		OILER MAINTENANCE		Overtime:		Class:		EOC:		HOU												
Res Dept:	943	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:		0.0	0.0	0.0	0.0	87.3	590.5	301.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:		0.0	0.0	0.0	0.0	87.3	677.8	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2	979.2
Yr Total Cost:		0	0	0	0	3,148	22,747	12,584	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	3,148	25,895	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478	38,478

Resource:	OPRMGR	LABOR																				
		OPERATIONS MGR		Overtime:		Class:		EOC:		SAL												
Res Dept:	943	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	
Yr Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1 H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AL OPERATIONS & MAINTENANCE
COMMENT#: F07-040,F07-061
ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

Yr Hours:	0.0	0.0	744.0	734.0	24,099.0	13,317.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	744.0	1,478.0	8,682.0	32,781.0	46,098.0	46,098.0	46,098.0
Yr Total Cost:	0	0	43,365	45,305	2,060,740	1,240,970	0	0	0
Cum Total Cost:	0	0	43,365	88,670	617,634	2,678,374	3,919,343	3,919,343	3,919,343

Resource:	PAINTR	PAINTER	EOC:	LABOR
Res Dept:	943	Overtime:	HOU	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0
Cum Total Cost:	0	0	0	0

Resource:	PIPFTR	PIPE FITTER	EOC:	LABOR
Res Dept:	943	Overtime:	HOU	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0
Cum Total Cost:	0	0	0	0

Resource:	PJSREP	PROJECT SUPPORT REP	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0
Cum Total Cost:	0	0	0	0

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1A
COMMENT#: F07-040,F07-061
OPERATIONS & MAINTENANCE

Resource: RADENG
Res Dept: 943

Resource: RAD ENGINEER
Res Dept: 943

EOC: SAL
Class:

	LABOR																			
	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum								
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	598.6	4,018.5	2,072.9	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0
Cum Hours:	0	0	0	0	0	0	0	0	598.6	4,617.1	6,690.0	148,294	148,294	449,218	449,218	449,218	449,218	449,218	449,218	449,218
Yr Total Cost:	0	0	0	0	0	0	0	0	36,975	263,949	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0	6,690.0
Cum Total Cost:	0	0	0	0	0	0	0	0	36,975	300,924	449,218	449,218	449,218	449,218	449,218	449,218	449,218	449,218	449,218	449,218

Resource: RADTEC
Res Dept: 943

EOC: SAL
Class:

	LABOR																			
	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10,769.5	32,147.9	17,902.6	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0
Cum Hours:	0	0	0	0	0	0	0	0	10,769.5	42,917.4	60,820.0	1,106,362	1,106,362	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309
Yr Total Cost:	0	0	0	0	0	0	0	0	514,522	1,822,425	1,106,362	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0	60,820.0
Cum Total Cost:	0	0	0	0	0	0	0	0	514,522	2,336,947	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309	3,443,309

Resource: RIGGER
Res Dept: 943

EOC: HOU
Class:

	LABOR																			
	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum								
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	435.2	2,953.2	1,507.6	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0
Cum Hours:	0	0	0	0	0	0	0	0	435.2	3,388.4	4,896.0	74,539	74,539	227,808	227,808	227,808	227,808	227,808	227,808	227,808
Yr Total Cost:	0	0	0	0	0	0	0	0	18,579	134,689	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0
Cum Total Cost:	0	0	0	0	0	0	0	0	18,579	153,268	227,808	227,808	227,808	227,808	227,808	227,808	227,808	227,808	227,808	227,808

Resource: S&HENG
Res Dept: 943

EOC: SAL
Class:

	LABOR																			
	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum	Yr	Cum								
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	435.2	2,953.2	1,507.6	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0
Cum Hours:	0	0	0	0	0	0	0	0	435.2	3,388.4	4,896.0	74,539	74,539	227,808	227,808	227,808	227,808	227,808	227,808	227,808
Yr Total Cost:	0	0	0	0	0	0	0	0	18,579	134,689	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0	4,896.0
Cum Total Cost:	0	0	0	0	0	0	0	0	18,579	153,268	227,808	227,808	227,808	227,808	227,808	227,808	227,808	227,808	227,808	227,808

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1 HD
CTRL ACCT: H51A
CHARGE NO: H51A
COMMENT#: F07-040,F07-061
ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

	LABOR		SAFETY TECH		OVERTIME		CHEM		SUBS		SERVSUB		WELDER		OVERTIME		HOU	
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	LABOR		SAFETY TECH		OVERTIME		CHEM		SUBS		SERVSUB		WELDER		OVERTIME		HOU	
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	LABOR		SAFETY TECH		OVERTIME		CHEM		SUBS		SERVSUB		WELDER		OVERTIME		HOU	
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	LABOR		SAFETY TECH		OVERTIME		CHEM		SUBS		SERVSUB		WELDER		OVERTIME		HOU	
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GRAND TOTALS:

Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1A
COMMENT#: F07-040;F07-061
OPERATIONS & MAINTENANCE
ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Hours	0.0	698.8	1,814.8	1,394.6	81,467.2	291,807.8	169,987.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	698.8	2,513.6	3,908.2	85,375.4	377,183.1	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0	547,171.0
Yr Total Cost	0	30,689	89,173	73,665	4,649,913	21,535,755	14,680,993	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	30,689	119,862	193,526	4,843,439	26,379,195	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188	41,060,188

CAM: *Robert Fellman*

CAM: *Robert Fellman*

CONTROL TEAM

HS1AM

WASTE OPERATIONS

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
C/M: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AM WASTE OPERATIONS
COMMENT#: F07-041, F07-061
Resource: HAZWAT (1 FTE EQUALS 1747 HOURS)
Res Dept: 943

Resource:	Res Dept:	Class:	HAZWAT											
			Overtime: HOU											
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			0.0	0.0	0.0	0.0	4,917.6	14,167.3	11,835.1	30,920.0	30,920.0	30,920.0	0.0	
Yr Total Cost:			0	0	0	0	4,917.6	19,084.9	30,920.0	30,920.0	30,920.0	30,920.0	0	
Cum Total Cost:			0	0	0	0	198,316	689,790	624,687	1,512,793	1,512,793	1,512,793	1,512,793	

Resource:	Res Dept:	Class:	HEAVY EQUIP OPERATOR											
			Overtime: HOU											
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			0.0	0.0	0.0	0.0	4,141.6	14,167.3	11,835.1	30,144.0	30,144.0	30,144.0	0.0	
Yr Total Cost:			0	0	0	0	186,177	753,762	682,621	1,622,559	1,622,559	1,622,559	0	
Cum Total Cost:			0	0	0	0	186,177	939,939	1,622,559	1,622,559	1,622,559	1,622,559	1,622,559	

Resource:	Res Dept:	Class:	MATERIAL OBJCLASS300											
			Overtime: MAT											
Yr Units:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Units:			0.0	62.5	1,198.2	1,195.3	1,200.0	1,060,914.5	2,258,742.5	3,323,313.0	3,323,313.0	3,323,313.0	0.0	
Yr Total Cost:			0	64	1,264	2,456.0	3,656.0	1,064,570.5	3,323,313.0	3,323,313.0	3,323,313.0	3,323,313.0	0	
Cum Total Cost:			0	64	1,328	2,624	3,962	1,216,810	2,665,782	3,886,553	3,886,553	3,886,553	3,886,553	

Resource:	Res Dept:	Class:	MOTOR VEHICLE OPER											
			Overtime: HOU											
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			0.0	0.0	0.0	0.0	1,516.9	4,722.1	3,945.0	10,184.0	10,184.0	10,184.0	0.0	
Yr Total Cost:			0	0	0	0	61,860	230,467	208,735	501,062	501,062	501,062	0	
Cum Total Cost:			0	0	0	0	61,860	292,326	501,062	501,062	501,062	501,062	501,062	

Resource:	Res Dept:	Class:	TRAVEL RESOURCE											
			Overtime: ODC											
Yr Hours:			Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10		
Cum Hours:			0.0	0.0	0.0	0.0	1,516.9	4,722.1	3,945.0	10,184.0	10,184.0	10,184.0	0.0	
Yr Total Cost:			0	0	0	0	61,860	230,467	208,735	501,062	501,062	501,062	0	
Cum Total Cost:			0	0	0	0	61,860	292,326	501,062	501,062	501,062	501,062	501,062	

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR R FELLMAN
CAM: R FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS OHFN07
WBS 1.1.H.D
CTRL ACCT H51A
CHARGE NO: H51AM WASTE OPERATIONS
COMMENT#: F07-041, F07-061

	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Units	0.0	781.3	28,140.6	69,378.2	60,000.0	59,760.0	7,440.0	0.0	0.0	0.0
Cum Units	0.0	781.3	28,921.8	98,300.0	158,300.0	218,060.0	225,500.0	225,500.0	225,500.0	225,500.0
Yr Total Cost:	0	802	29,681	75,224	66,877	68,541	8,781	0	0	0
Cum Total Cost:	0	802	30,483	105,707	172,584	241,126	249,906	249,906	249,906	249,906

Resource: OPRMGR OPERATIONS MGR EOC: LABOR
Res Dept: 943 Overtime: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	3,540.8	11,187.3	9,372.5	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	0.0	3,540.8	14,728.0	24,100.5	24,100.5	24,100.5	24,100.5
Yr Total Cost:	0	0	0	0	257,222	957,071	868,510	0	0	0
Cum Total Cost:	0	0	0	0	257,222	1,214,294	2,082,804	2,082,804	2,082,804	2,082,804

Resource: PJSMGR PROJECT SUPPORT MGR EOC: LABOR
Res Dept: 943 Overtime: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	441.0	1,747.0	1,732.6	1,479.0	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	441.0	2,188.0	3,920.6	5,399.6	5,399.6	5,399.6	5,399.6
Yr Total Cost:	0	0	0	23,804	99,890	105,845	97,947	0	0	0
Cum Total Cost:	0	0	0	23,804	123,695	229,539	327,486	327,486	327,486	327,486

Resource: QACENG QA ENGINEER EOC: LABOR
Res Dept: 943 Overtime: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	1,540.5	1,479.0	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	0.0	0.0	1,540.5	3,019.5	3,019.5	3,019.5	3,019.5
Yr Total Cost:	0	0	0	0	0	94,601	98,461	0	0	0
Cum Total Cost:	0	0	0	0	0	94,601	193,061	193,061	193,061	193,061

Resource: QACTEC QA/QC TECH EOC: LABOR
Res Dept: 943 Overtime: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	744.0	2,630.0	7,235.7	14,368.3	11,835.1	0.0	0.0	0.0
Cum Hours	0.0	0.0	744.0	3,374.0	10,609.7	24,977.9	36,813.0	36,813.0	36,813.0	36,813.0
Yr Total Cost:	0	0	25,614	95,884	302,234	748,156	670,036	0	0	0
Cum Total Cost:	0	0	25,614	121,498	423,732	1,171,888	1,841,924	1,841,924	1,841,924	1,841,924

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: H51A
CHARGE NO: H51AM WASTE OPERATIONS
COMMENT#: F07-041, F07-061
ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

Resource: Res Dept:	RADTEC 943	RAD TECH Overtime:	Class:		EOC: SAL		LABOR								
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Yr Hours:			0.0	0.0	0.0	2,624.7	2,624.7	19,960.0	19,960.0	19,960.0	19,960.0	19,960.0	19,960.0	19,960.0	19,960.0
Cum Hours:			0.0	0.0	0.0	2,624.7	5,249.4	19,960.0	22,584.7	42,544.7	62,504.7	82,464.7	102,424.7	122,384.7	142,344.7
Yr Total Cost:			0	0	0	128,633	257,266	1,165,996	2,331,992	3,497,988	4,663,984	5,829,980	7,000,000	8,170,000	9,340,000
Cum Total Cost:			0	0	0	128,633	386,299	1,165,996	3,502,000	6,998,988	10,495,972	13,992,956	17,489,940	20,986,924	24,483,908

Resource: Res Dept:	SERVSUB 943	SUBS Overtime:	Class:		EOC: SUB		SUBCONTRACTORS								
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Yr Units:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:			0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	TPHO 943	TEAM PARTNER HOME OF DURK Overtime:	Class:		EOC: TP		LABOR								
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Yr Hours:			88.7	1,747.0	1,747.0	5,329.7	5,329.7	7,292.7	7,292.7	7,292.7	7,292.7	7,292.7	7,292.7	7,292.7	7,292.7
Cum Hours:			88.7	1,835.7	3,582.7	8,912.4	14,242.1	21,534.8	28,827.5	36,120.2	43,412.9	50,705.6	58,000.0	65,292.7	72,585.4
Yr Total Cost:			0	188,247	199,346	211,163	211,163	30,249	30,249	30,249	30,249	30,249	30,249	30,249	30,249
Cum Total Cost:			0	197,267	396,613	607,776	818,939	1,120,188	1,421,437	1,722,686	2,023,935	2,325,184	2,626,433	2,927,682	3,228,931

Resource: Res Dept:	TRNLAB 943	TRANSPORT LABORER Overtime:	Class:		EOC: HOU		LABOR								
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Yr Hours:			0.0	0.0	0.0	6,881.4	6,881.4	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0
Cum Hours:			0.0	0.0	0.0	6,881.4	13,762.8	55,114.8	96,666.8	138,218.8	179,770.8	221,322.8	262,874.8	304,426.8	345,978.8
Yr Total Cost:			0	0	0	236,678	236,678	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600
Cum Total Cost:			0	0	0	236,678	473,356	1,655,956	3,075,556	4,495,156	5,914,756	7,334,356	8,753,956	10,173,556	11,593,156

Resource: Res Dept:	WSTENG 943	WASTE ENGINEER Overtime:	Class:		EOC: SAL		LABOR								
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Yr Hours:			0.0	0.0	0.0	6,881.4	6,881.4	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0	41,552.0
Cum Hours:			0.0	0.0	0.0	6,881.4	13,762.8	55,114.8	96,666.8	138,218.8	179,770.8	221,322.8	262,874.8	304,426.8	345,978.8
Yr Total Cost:			0	0	0	236,678	236,678	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600	1,419,600
Cum Total Cost:			0	0	0	236,678	473,356	1,655,956	3,075,556	4,495,156	5,914,756	7,334,356	8,753,956	10,173,556	11,593,156

HS1AN

SAFE SHUTDOWN

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AN
COMMENT#: F07-042

SAFE SHUTDOWN

	Sep 01		Sep 02		Sep 03		Sep 04		Sep 05		Sep 06		Sep 07		Sep 08		Sep 09		Sep 10	
	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: INSMEC
Res Dept: 943

INSTRUMENT MECHANIC
Overtime: EOC: HOU

LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MAT300
Res Dept: 943

MATERIAL OBJCLASS300
Overtime: EOC: MAT

MATERIAL

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Units	Cum Units	Yr Total Cost	Cum Total Cost	Yr Units	Cum Units	Yr Total Cost	Cum Total Cost	Yr Units	Cum Units	Yr Total Cost	Cum Total Cost	Yr Units	Cum Units	Yr Total Cost	Cum Total Cost	Yr Units	Cum Units	Yr Total Cost	Cum Total Cost
Yr Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MILWRT
Res Dept: 943

MILLWRIGHT
Overtime: EOC: HOU

LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MNTMGR
Res Dept: 943

MAINTENANCE MGR
Overtime: EOC: SAL

LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost	Yr Hours	Cum Hours	Yr Total Cost	Cum Total Cost
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
[REDACTED]
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HSTA
CHARGE NO: HS1AN SAFE SHUTDOWN
COMMENT#: F07-042

Resource: Res Dept:	MNTREP 943	MAINTENANCE REP Overtime:	Class:		EOC:		LABOR											
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10							
Yr Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	ODC700 943	ODC700 Overtime:	Class:		EOC:		LABOR											
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10							
Yr Units:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	OPRMGR 943	OPERATIONS MGR Overtime:	Class:		EOC:		LABOR											
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10							
Yr Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	PIPFTR 943	PIPE FITTER Overtime:	Class:		EOC:		LABOR											
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10							
Yr Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	PJSREP 943	PROJECT SUPPORT REP Overtime:	Class:		EOC:		LABOR											
			Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10							
Yr Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: H51A
CHARGE NO: HS1AN SAFE SHUTDOWN
COMMENT#: F07-042

(1 FTE EQUALS 1747 HOURS)

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: RAD ENG
Res Dept: 943
Class: LABOR
EOC: SAL

Resource: RAD TECH
Res Dept: 943
Class: LABOR
EOC: SAL

Resource: S&H ENG
Res Dept: 943
Class: LABOR
EOC: SAL

Resource: SERVSUB
Res Dept: 943
Class: SUB
EOC: SUB

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: RAD TECH
Res Dept: 943
Class: LABOR
EOC: SAL

Resource: S&H ENG
Res Dept: 943
Class: LABOR
EOC: SAL

Resource: SERVSUB
Res Dept: 943
Class: SUB
EOC: SUB

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: S&H ENG
Res Dept: 943
Class: LABOR
EOC: SAL

Resource: SERVSUB
Res Dept: 943
Class: SUB
EOC: SUB

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: SERVSUB
Res Dept: 943
Class: SUB
EOC: SUB

Resource: SERVSUB
Res Dept: 943
Class: SUB
EOC: SUB

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HS1AP

D&D SUPPORT

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

DATE: 09/05/01
PROJECT MGR: R FELLMAN
CAM R FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AP
COMMENT#: F07-043
D&D SUPPORT

Resource: CNSCOD
Res Dept: 943
CONSTRUCTION COORD
Overtime: EOC: SAL
Class: (1 FTE EQUALS 1747 HOURS)

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 02	Sep 03	Sep 03	Sep 04	Sep 04	Sep 05	Sep 05	Sep 06	Sep 06	Sep 07	Sep 07	Sep 08	Sep 08	Sep 09	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: CNSENG
Res Dept: 943
CONSTRUCTION ENG
Overtime: EOC: SAL
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 02	Sep 03	Sep 03	Sep 04	Sep 04	Sep 05	Sep 05	Sep 06	Sep 06	Sep 07	Sep 07	Sep 08	Sep 08	Sep 09	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: ENSTEC
Res Dept: 943
ENVR SCIENTIST TECH
Overtime: EOC: SAL
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 02	Sep 03	Sep 03	Sep 04	Sep 04	Sep 05	Sep 05	Sep 06	Sep 06	Sep 07	Sep 07	Sep 08	Sep 08	Sep 09	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: HAZWAT
Res Dept: 943
HAZWAT
Overtime: EOC: HOU
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 02	Sep 03	Sep 03	Sep 04	Sep 04	Sep 05	Sep 05	Sep 06	Sep 06	Sep 07	Sep 07	Sep 08	Sep 08	Sep 09	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: HEOOPR
Res Dept: 943
HEAVY EQUIP OPERATOR
Overtime: EOC: HOU
Class: LABOR

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 02	Sep 03	Sep 03	Sep 04	Sep 04	Sep 05	Sep 05	Sep 06	Sep 06	Sep 07	Sep 07	Sep 08	Sep 08	Sep 09	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AP
COMMENT#: F07-043
D&D SUPPORT

(1 FTE EQUALS 1747 HOURS)

Resource: Res Dept:	QA/QC TECH Overtime:	Class:		EOC:		LABOR							
		Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10			
Resource: QACTEC Res Dept: 943													
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	RAD ENGINEER Overtime:	Class:		EOC:		LABOR							
		Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10			
Resource: RADENG Res Dept: 943													
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	RAD SUPERVISOR/MGR Overtime:	Class:		EOC:		LABOR							
		Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10			
Resource: RADMGR Res Dept: 943													
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	RAD TECH Overtime:	Class:		EOC:		LABOR							
		Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10			
Resource: RADTEC Res Dept: 943													
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: Res Dept:	SAFETY ENGINEER Overtime:	Class:		EOC:		LABOR							
		Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10			
Resource: S&HENG Res Dept: 943													
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1HD
CTRL ACCT: HS1A
CHARGE NO: HSTAP
COMMENT#: F07-043
D&D SUPPORT

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Yr	Sep																			
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: S&HTEC
Res Dept: 943
Class: LABOR
EOC: SAL

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Yr	Sep																			
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: SERVUSUB
Res Dept: 943
Class: LAB
EOC: SUB

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Yr	Sep																			
Yr Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: TRNLAB
Res Dept: 943
Class: LABOR
EOC: HOU

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Yr	Sep																			
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: WSTENG
Res Dept: 943
Class: LABOR
EOC: SAL

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Yr	Sep																			
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HS1AR

D&D SUBCONTRACT

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AR D&D SUBCONTRACT
COMMENT#:

Resource: FIELDSUB FIELD SUBS EOC: SUB
Res Dept: 943 Overtime:

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
Yr Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GRAND TOTALS:

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Robert Fellman

Robert Fellman

CAM:

CONTROL TEAM

Memorandum

To:	Karen Wintz	Date:	May 15, 2001
Location:	Fernald	Reference:	N/A
From:	Ken Kepler, MS80-3	Fernald #:	M:OOTP(PC/EST):2001-0068
Location:	Springdale	Client:	DOE DE-AC24-01OH20115
Extension:	648-6767	Subject:	SILO 3 DEMOLITION

c: File Record Subject ESTIMATE C4-2001-05-007
Roger Johnson, MS51
Dennis Nixon, MS52-4
Karen Wentz, MS52-4

Attached are two (2) copies for the SILO 3 DEMOLITION.

To request any additional copies of this estimate or for any questions, please contact Roger Johnson on extension 4140.

KGK:RLJ:hmp
Attachment

ESTIMATE REVIEW FORM

PROJECT: Silo 3 Demolition
ESTIMATE NO.: C4-2001-05-007
CLIENT: DOE
WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 15-May-01
ESTIMATOR: Johnson
LOCATION: Fernald
TASK NO.: HS1AR

COMPLETE ESTIMATE PACKAGE YES _____ NO _____

REQUIRED DOCUMENTS The documents that were used for this estimates is the cost estimate to construct the facility.

COMMENTS: The D&D of silo #3 basis is the cost estimate for the construction portion that was developed. The quantities that were installed were removed. The only exceptions are the existing slab that The Treatment facility was constructed on and the slab that the HVAC stack is resting on. When possible, D&D rates from previous Fernald estimates were used. If the units (lots or sf) were used, the hours to do this work are those of the estimator and his judgement. The estimate was reviewed by the project and all comments have been in have been incorporated.

REVIEWERS SIGNATURE _____ DATE _____

RESOLUTION: _____

ESTIMATOR: _____ DATE _____

REVIEWER: _____ DATE _____

ESTIMATE REVIEW FORM

PROJECT: Silo 3 Demolition
ESTIMATE NO.: C4-2001-05-007
CLIENT: DOE
WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 15-May-01
ESTIMATOR: Johnson
LOCATION: Fernald
TASK NO.: HS1AR

OTHER REVIEWS:

Multiple horizontal lines for handwritten notes or reviews.

REQUESTER _____

DATE _____

CAM if > \$100,000 _____

DATE _____

PROJ.MGR. if >\$ 1M _____

DATE _____

ESTIMATING SERVICES
TEAM COACH  _____

DATE 5/15/01

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 3 Project Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-01-05-007

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input checked="" type="checkbox"/>	Equipment List	<input checked="" type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input checked="" type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4.01.05.007 is to provide a cost estimate for the demolition of the silo # 3 Containment and Treatment Shelters , the process and mechanical equipment and all other materials associated with this project. All costs are in 2001 dollars. The quantities used are from the silo # 3 construction estimate. Additional concrete for the existing Treatment slab and The HVAC stack slab have been incorporated.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 3 Project Demolition
WBS: 1.1.H.D
PROJECT ENGINEER: Jeff Stone
ESTIMATOR: R Johnson
ESTIMATE NUMBER: C4-01-05-007

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
 - Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

WASTE PROGRAM MANAGEMENT:

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 3 Project Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-01-05-007

Waste Program Management dollars provided by the Project Engineer.

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

A (HO EXPENSE

expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

G &

This

HEALTH PHYSICS:

attached APPENDIX "C".

See

RISK BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION: Silo 3 Project Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-01-05-007

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The construction estimate was the primary source for the material take-off.
- The unit man-hours were from previous D & D estimates.
- Utilities to this facility will be from near by sources.

EXCLUSIONS:

- Permits and fees.
- FD G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
-

ESTIMATE SUMMARY SHEET

PROJECT: Silo 3 Demolition
 ESTIMATE #: C4-2001-05-007
 CLIENT: DOE
 WBS #: 1.1.H.D

FLUOR FERNALD

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
Mobilization/Demobilization	220		\$5,000				\$5,000
Site Work	294		\$7,000				\$7,000
Concrete	546		\$12,300				\$12,300
Structural	57		\$1,400				\$1,400
Buildings	824		\$18,700				\$18,700
Equipment	435		\$10,300				\$10,300
Piping	181		\$4,800				\$4,800
Electrical	260		\$5,900				\$5,900
Instrumentation	109		\$2,500				\$2,500
Painting	0		\$0				\$0
Insulation	22		\$500				\$500
				\$0			
DIRECT FIELD COSTS TOTAL	2,949	\$23.19	\$68,400	\$0	\$0	\$0	\$68,400
SUPERVISION - CONTRACTOR	2,212		\$51,300				\$51,300
SMALL TOOLS & CONSUMABLES	-	-	-		\$5,500		\$5,500
MISC. EQUIP. RENTAL	-	-	-			\$70,800	\$70,800
TEMPORARY FACILITIES	118		\$2,700		\$2,700		
TEMPORARY UTILITY HOOK-UP	96		\$2,200		\$1,200		
JOB CLEAN-UP	177		\$4,100		\$1,400		
PER DIEM / SUBSISTANCE	-	-	-				
HEALTH PHYSICS S/C	65		\$1,500		\$3,800		
CERCLA - TRAINING	25		\$600				
GET/SITE ACCESS & JOB SPECIFIC TRAINING	90		\$2,100				
PAYROLL BURDENS & BENEFITS	-	-	\$75,800				\$75,800
OVERHEAD & PROFIT	-	-	-	\$54,400			\$54,400
BOND	-	-	-	\$4,200			\$4,200
SALES TAX	-	-	-		\$900	\$4,200	\$5,100
INDIRECT FIELD COSTS TOTAL	2,782		\$140,300	\$58,600	\$15,500	\$75,000	\$289,400
DIRECT & INDIRECT FIELD COSTS TOTAL	5,731	\$36.41	\$208,700	\$58,600	\$15,500	\$75,000	\$357,800
TARGET ESTIMATE							\$357,800

ESTIMATE PERFORMED BY ESTIMATING SERVICES

ESTIMATE SUMMARY SHEET

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

FACTORS

FIXED PRICE \$	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$68,400	\$0	\$0	\$0	\$3,800	\$72,200
IFC COST FACTOR	4.3152				-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.1959	1.1959	1.1959	1.1959	1.1959	*
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	5.1604	1.1959	1.1959	1.1959	1.2676	
BASE ESTIMATE \$'s	\$352,968	\$0	\$0	\$0	\$4,817	\$357,785
BASE FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	5.1604	1.1959	1.1959	1.1959	1.2676	
FPS TARGET ESTIMATE (FY01 \$)	\$352,968	\$0	\$0	\$0	\$4,817	\$357,785

NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY01 for input to microframe. SEE De-Escalated Summary.
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G62.

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS		Rate	COST / UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total		Labor	S/C	Mat'l					
	Mobilization/Demobilization				220					\$5,000				\$5,000
	Site Work				294					\$7,000				\$7,000
	Concrete				546					\$12,300				\$12,300
	Structural				57					\$1,400				\$1,400
	Buildings				824					\$18,700				\$18,700
	Equipment				435					\$10,300				\$10,300
	Piping				181					\$4,800				\$4,800
	Electrical				260					\$5,900				\$5,900
	Instrumentation				109					\$2,500				\$2,500
	Painting													
	Insulation				22					\$500				\$500
Subtotal Direct Cost										\$88,400				\$88,400

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

ITEM NO.	DESCRIPTION	QTY	UNIT	MAN-HOURS	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
					Unit	Rate	Labor					
D	Excavation	365	cy	112	0.22	21.49		\$2,410				\$2,410
D	Backfill & compact	420	cy	88	0.15	21.49		\$1,890				\$1,890
D	Haul and Dump	420	cy	59	0.10	21.49		\$1,260				\$1,260
C	Cut opening in Silo	1	ea									
D	Install hardware for rigging concrete sections	12	ea									
D	Sandbedding	11	cy									
C	Erect and dismantle scaffolding for opening	1	lot									
D	Brace concrete blocks in silo	3	lot									
C	Remove bracing from blocks	3	lot									
C	Remove concrete bolcks from silo	3	ea									
C	Encapsulate concrete Bolcks	3	ea									
D	Dust Control	1	ea									
mC	Excavation for sump in existing floor	2	cy									
mC	Saw hole in concrete floor for sump	72	lf									
mC	Decon of equipment	1	lot									
D	Remove concrete/asphalt	1	lot									
D	Remone FW foundation	4	cy									
D	Remove pipe rack	1	lot									
D	Improve road to Railroad	625	sy									
D	Improve loading area at Railroad	555	sy									
D	Pins/chains for concrete removal	1	lot									
mC	Excavate for DW	80	cy									
mC	Excavate for w/g Elect.	100	cy									
D	Remove Sump Cutout	1	ea									
D	Cover road w/6" of gravel	625	sy									
D	Cover track loading w 6" of Gravel	555	sy									
C	Reinforce silo for cutting	1	lot									
D	Haul in backfill	130	cy									
D	CAT testing	1	lot									
D	Remob for start-up support	1600	hrs									
D	Silt Fencing	1000	lf									
D	Haul pipe rack,pipe,elect,etc to OSDF	1	lot									
D	Overtime @ 25 % of construction costs			25				\$695				\$695
D	Relocate shield blocks	1	lot					\$750				\$750
D	Install dirt bin											
Subtotal Direct Cost											\$7,010	\$7,010

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MATT'L	EQUIP	TOTAL
			Unit	Total		Labor	S/C	Mat'l					
D	8000	ea	0.02	224	22.69								\$5,070
mC	1400	ea	0.04	104	22.69								\$2,360
D	1	ea	20.00	28	22.69								\$630
D	1	ea	25.00	35	22.69								\$790
D	9600	sf	0.01	121	22.69								\$2,740
mC	200	sf	0.09	33	22.69								\$760
mC	5600	lbs	0.01	52	22.69								\$1,180
mC	90	lf	0.10	17	22.69								\$380
D	8	ea	2	22	22.69								\$510
D	6400	sf	0.00	18	22.69								\$410
D	12	ea	1.00	17	22.69								\$380
D	20	ea	1	37	22.69								\$840
mC	4	ea	2.00	11	22.69								\$250
D	1	lot			22.69								\$420
D	440	sf	0.030	18	22.69								\$100
D	330	sf	0.010	5	22.69								\$310
D	330	sf	0.030	14	22.69								\$130
D	2	ea	2.00	6	22.69								\$60
D	2	ea	1.00	3	22.69								\$70
D	770	sf	0.00	37	22.69								\$840
mC	20	ea	1	6	22.69								\$130
D	8	ea	0.50	6	22.69								\$250
D	2	ea	4.00	11	22.69								\$60
D	1	ea	2.00	3	22.69								
									19,700				\$18,700

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Equip	Mat'l					
D	1	ea	20	28	\$23.60		\$660				\$660	
D	3	ea	4	17	\$23.60		\$400				\$400	
D	2	ea	3	8	\$23.60		\$200				\$200	
D	1	ea	4	6	\$23.60		\$130				\$130	
D	2	ea	2	6	\$23.60		\$130				\$130	
D	1	ea	3	4	\$23.60		\$100				\$100	
D	1	ea	4	6	\$23.60		\$130				\$130	
D	1	ea	6	8	\$23.60		\$200				\$200	
D	1	ea	12	17	\$23.60		\$400				\$400	
D	1	ea	20	28	\$23.60		\$660				\$660	
D	1	ea	12	17	\$23.60		\$400				\$400	
D	1	ea	15	21	\$23.60		\$490				\$490	
D	3	ea	4	17	\$23.60		\$400				\$400	
D	1	See	Site	Work								
D	1	ea	16	22	\$23.60	Cost is in Cut Opening in Silo	\$530				\$530	
D	1	allow			\$23.60							
D	1	ea	2	3	\$23.60		\$70				\$70	
mC	1	ea	18	33	\$23.60		\$790				\$790	
D	2	ea	4	6	\$23.60		\$130				\$130	
D	1	ea	1	1	\$23.60		\$30				\$30	
mC	10	ea	2	37	\$23.60		\$880				\$880	
D	9	ea	2	25	\$23.60		\$590				\$590	
D	1	ea	12	17	\$23.60		\$400				\$400	
D												
D												
D	10	ea	1	14	\$23.60		\$330				\$330	
D	1	ea	20	28	\$23.60		\$660				\$660	
D	1	lot	6	8	\$23.60		\$200				\$200	
D	1	ea	20	28	\$23.60		\$660				\$660	
D	1	ea	6	8	\$23.60		\$200				\$200	
D	1	ea	16.0	22	\$23.60		\$530				\$530	
				435			\$10,300				\$10,300	
Subtotal Direct Cost												

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL				
			Unit	Total		Labor	S/C	Mat'l						Equip			
D	1	lot	99	139	26.40				\$3,670				\$3,670				
D	200	lf	0.14	39	26.40				\$1,030				\$1,030				
D	1	ea	1.00	1	26.40				\$40				\$40				
D	6	ea	1.00	6	26.40				\$40				\$40				
D	18	ea	1.00	18	26.40				\$40				\$40				
D	1	lot	1.00	1	26.40				\$40				\$40				
D	1	lot	1.00	1	26.40				\$40				\$40				
D	1	lot	1.00	1	26.40				\$40				\$40				
Subtotal Direct Cost													4,800				\$4,800

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C					
D	1	lot	15	20	22.66		\$460					\$460
D	9300	sf	0.00	9	22.66		\$210					\$210
D	9	ea	2.00	25	22.66		\$570					\$570
D	1	ea	2.00	3	22.66		\$60					\$60
D	500	lf	0.00	6	22.66		\$60					\$60
D	9300	allow	0	5	22.66		\$150					\$150
D	990	lf	0	5	22.66		\$110					\$110
D	550	lf	0	5	22.66		\$100					\$100
D	1	ea	2	3	22.66		\$60					\$60
D	625	lf	0.00	2	22.66		\$40					\$40
D	1800	lf	0.01	15	22.66		\$340					\$340
D	990	lf	0.01	12	22.66		\$280					\$280
D	1450	lf	0.32	5	22.66		\$120					\$120
D	12	ea	0.32	2	22.66		\$40					\$40
D	4	ea	0.32	2	22.66		\$40					\$40
D	4	ea	0.32	2	22.66		\$50					\$50
D	5	ea	0.32	1	22.66		\$30					\$30
D	1	ea	1	3	22.66		\$60					\$60
D	6	ea	0.32	6	22.66		\$130					\$130
D	80	lf	0.05	1	22.66		\$20					\$20
D	1595	lf	0.00	18	22.66		\$410					\$410
D	156	ea	0.00	1	22.66		\$20					\$20
D	300	lf	0.01	10	22.66		\$240					\$240
D	2150	lf	0.01	4	22.66		\$90					\$90
D	2040	lf	0.01	34	22.66		\$760					\$760
D	216	ea	4.0	11	22.66		\$250					\$250
D	200	lf	0.01	22	22.66		\$510					\$510
D	1375	lf	0.01	15	22.66		\$350					\$350
D	1250	lf	0.01	15	22.66		\$350					\$350
D	100	ea	3.0	4	22.66		\$90					\$90
D	1	ea	6.0	34	22.66		\$760					\$760
D	4	ea	4.0	11	22.66		\$250					\$250
D	2	ea	2.0	22	22.66		\$510					\$510
D	1	lot	0.5	15	22.66		\$350					\$350
D	8	ea	0.5	15	22.66		\$350					\$350
D	22	ea	0.5	15	22.66		\$350					\$350
Subtotal Check Cost												

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total		Labor	S/C	Mat'l					
D	60	lf	0	1	22.66			\$10				\$10	
D	200	lf			22.66								
D	6	ea	0.006	1	22.66			\$20				\$20	
D	80	lf			22.66								
D	90	lf			22.66								
D	8	ea			22.66								
D	660	lf	0.006	6	22.66			\$130				\$130	
D	1	lot	6	8	22.66			\$190				\$190	
D	1	ea			21.49								
D													
<p>TOTAL: 280.52789 Hours, \$5,900 Labor, \$55,900 Total</p>													

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total		Labo	S/C	Mat'l					
D	3450	sf			\$23.33								
D	1245	sf			\$23.33								
D	1	lot			\$23.33								
D	9400	sf			\$23.33								
Subtotal Direct Cost													
													#DIV/0!

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total		Labor	S/C	Mat'l					
D	1	lot	16	22	\$21.48				\$480				\$480
												\$500	
												\$500	

APPENDIX "A"

PROJECT: Silo 3 Demolition		DATE: 15-May-01										
ESTIMATE NO:4-2001-05-007		ESTIMATOR: Johnson										
CLIENT: DOE		LOCATION: Fernald										
WBS NO.: 1.1.H.D		TASK NO.: HS1AR										
SITE SPECIFIC												
EFFICIENCY / MULTIPLIER ANALYSIS												
PERCENT OF INFLUENCE ON CHART MANHOURS	PERCENT OF INFLUENCE ON CHART MANHOURS				WT'D VALUE	PROD. RESULT						
	40%	50%	60%	70%			80%	90%	100%	105%	110%	% OF INFLUENCE
CRAFT SKILL (NOTE 1)	POOR			FAIR		STD		V.GOOD	XCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR		STD				100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN	+40 TO +85				70.0%	20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT	UNDER 5,000 FT				100.0%	10.0%	0.1
WORK SPACE				200 SF	250 SF	300 SF	350 SF			80.0%	10.0%	0.08
WORK WEEK		← MULTIPLE SHIFTS				4-10s / 5-8s				100.0%	10.0%	0.1
50 HOUR WORK WEEK		MULTIPLE-SHIFT		OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK		MULTIPLE-SHIFT		OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
SHIFTWORK												
2ND SHIFT			3RD SHIFT		2ND SHIFT		OR ONE SHIFT ONLY			100.0%	3.0%	0.03
3RD SHIFT										100.0%	5.0%	0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		100.0%	4.0%	0.04
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			70.0%	8.0%	0.056
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
NOTES.....	1. TURNOVER HAS BEEN CONSIDERED 2. FOR EXTERIOR WORK ONLY											
	EFFICIENCY (AS A % OFF CHART MANHOURS)										100.0%	83.6%
	MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S)											1.20

EFFICIENCY FACTORS

PROJECT: Silo 3 Demolition
 ESTIMATE NO. C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

FLUOR FERNALD

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
<u>EFFICIENCY FACTORS:</u>		
* SITE SPECIFIC (SEE APPENDIX A)	20%	20.0
S/T = BASE UNIT MANHOURS		120
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0 120
* TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0 120
* PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL										
	D		Mod.'D'		Mod. "C"		C		C+		
PRODUCTIVITY HOURS (AS A %)/ADD MH's	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's		
(AS A MULTIPLIER)/TOTAL HRS	15.00%	1.15	1.38	71.00%	1.71	79.00%	1.79	74.00%	1.74	96.00%	1.96
TOTAL MULTIPLIER w/SITE PROD.	1.38		205.2		214.8		208.8		235.2		2.352

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
(SEE APPENDIX C - HEALTH PHYSICS)

0.0	Man Days	21.0	Man Days	21.0	Man Days	21.0	Man Days	24.0	Man Days
-----	----------	------	----------	------	----------	------	----------	------	----------

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: Silo 3 Demolition
 ESTIMATE NO. C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE MULTIPLIER DEVELOPEMENT

	D	mD	mC	C	C+
CREW SIZE & MAKE-UP					
STANDARD	7	7	7	7	7
WORKER-BUDDY	0	0	0	0	0
SUPPORT TEAM	0	0	0	0	0
TOTAL CREW	7	7	7	7	7
CREW SIZE RATIO	1.00	1.00	1.00	1.00	1.00
AVAILABLE WORK TIME FACTOR	0.96	0.78	0.7	0.7	0.68
PPE LABOR PRODUCTIVITY FACTOR	1	1	0.86	0.82	0.75
NET PRODUCTIVITY RATIO	0.96	0.78	0.602	0.574	0.51
NET PRODUCTIVITY MULTIPLIER	1.04	1.28	1.66	1.74	1.96

These factors were based on Tables 6.1 and 6.2. Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mD	mC	C	C+
TOTAL WORK MINUTES per D	4 - 10's	600	600	600	600	600
ADDIT'L SITE SAFETY MEETINGS NOT INCLD. IN BASE	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	0	3	3	3
	MINUTES	0	0	15	15	20
TOTAL			0	45	45	60
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	2
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	30
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS) 33.33%	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	20	20
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	N/A	N/A
	MINUTES	N/A	N/A	N/A	N/A	N/A
TOTAL						
AVAILABLE WORK TIME		575	465	420	420	405
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

HEALTH PHYSICS

PROJECT: Silo 3 Demolition
 ESTIMATE NO. C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY				
			Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		\$'s	*	MAN DAYS	MAT'L.\$'s	PPE LEVEL	(DOUBLE PPE)
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	72	\$963	C / C+	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	72	\$963	C / C+	
GLOVE LINER - DISPOSABLE	PR	0.24	3	72	\$52	C / C+	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	72	\$56	C / C+	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	72	\$220	C / C+	
APR CARTRIDGES - DISPOSABLE	PR	6.98	3	72	\$1,508	C / C+	
SUB-TOTAL		17.42	3		\$3,762		

\$/MD = \$51.32

PPE LEVEL mC							
DESCRIPTION	UNIT	\$'s		MAN DAYS	MAT'L.\$'s	PPE LEVEL	
FULL DRESS w/ FACE SHIELD							
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIE	PR	4.46	3	0	\$0	mC	
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	mC	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	mC	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	mC	
SUB-TOTAL		5.98	3		\$0		

\$/MD = \$0.00

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	\$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	\$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	\$0	C
SCBA	EA	1894.00	2	0	\$0	B
COOL VESTS	EA	137.50	6	0	\$0	C/B
THERMO STRIPS	EA	50.00	6	0	\$0	C/B
SUB-TOTAL					\$0	

MAT'L.\$'s
\$3,800

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Silo 3 Demolition
 ESTIMATE NO. C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	1	4	\$23.19	\$90
ANNUAL PHYSICALS	0	4	1	0	\$23.19	\$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	1	1	\$23.19	\$20
SUB-TOTAL						\$110

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	4	1	1	4	\$23.19	\$90
SUB-TOTAL						\$90

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR \$'s	
	3	2	6	\$23.19	\$100	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.0042735	5	0.0214	140

LABOR \$'s THRU SAFETY	LABOR \$'s
------------------------	------------

WORK DELAYS CAUSED BY MONITORING	0.5%	\$128,700	\$600
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LABOR \$'s

WORK DELAYS CAUSED BY RAD CHECKING	0.5%	\$128,700	\$600
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TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
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TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	\$1,500	\$3,800	\$5,300
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ACTIVITY DURATIONS

FLUOR FERNALD

PROJECT: Silo 3 Demolition
 ESTIMATE NO.: C4-2001-05-007
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	03-May-01	15-May-02	04-Sep-02	26-Dec-02		7.4 MONTHS
						0 MONTHS
TOTAL						7.4 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
a.	16.1 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS						0 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

ESTIMATE REVIEW FORM

PROJECT: SILOS D & D - OU4
C4-2001-05-009
CLIENT: DOE



DATE: 16-May-2001
ESTIMATOR: J.ELLIS
LOCATION: FERNALD

COMPLETE ESTIMATE PACKAGE YES _____ NO _____

REQUIRED DOCUMENTS Previous Estimate for silo demolition. New quantities from project
for the demolition of K-65 trench.

COMMENTS: Added to this estimate per project

REVIEWERS SIGNATURE _____ DATE _____

RESOLUTION: _____

ESTIMATOR: _____ DATE _____

REVIEWER: _____ DATE _____

ESTIMATE REVIEW FORM

PROJECT: SILOS D & D - OU4
ESTIMATE NO.: C4-2001-05-009
CLIENT: DOE
WBS NO.: 1.1.H.D

DATE: 16-May-2001
ESTIMATOR: J.ELLIS
LOCATION: FERNALD
TASK NO.: HS1AR

OTHER REVIEWS:

REQUESTER _____

DATE _____

CAM if > \$100,000 _____

DATE _____

PROJ.MGR. if > \$ 1M _____

DATE _____

ESTIMATING SERVICES
TEAM COACH  _____

DATE 5/16/01

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silos Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-2001-05-009

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input type="checkbox"/>	Equipment List	<input type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input checked="" type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4.01.05.009 is to up-grade a previous estimate to get the costs in 2001 dollars. Added demolition of K-65 trench to this estimate. The trench is assumed to be in a clean area(per Project direction) and no PPE will be used.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silos Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-2001-05-009

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
 - Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

WASTE PROGRAM MANAGEMENT:

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- Waste Program Management dollars provided by the Project Engineer.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silos Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-2001-05-009

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

A (HO EXPENSE

expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

**G &
This**

HEALTH PHYSICS:

See Appendix "C"

RISK

BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silos Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-2001-05-009

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The D & D estimate was the primary source to up-grade the cost.
- Project added the demolition of K-65 trench.
- All concrete will be sent to the OSDF

EXCLUSIONS:

- Permits and fees.
- FFS G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
- No PPE for demolition as project deemed it a clean area

ESTIMATE SUMMARY SHEET

PROJECT: SILOS D & D - 0U4
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D



DATE: 16-May-2001
 ESTIMATOR: J.ELIJS
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
DEMOLITION of K-65 TRENCH				\$100,600			\$100,600
DEMOLITION OF SILOS #1				\$273,500			\$273,500
RADON TREATMENT PLANT				\$164,100			\$164,100
DEMOLITION OF SILOS #2				\$273,500			\$273,500
DEMOLITION OF SILOS #3				\$273,500			\$273,500
DEMOLITION OF SILOS #4				\$273,500			\$273,500
DIRECT FIELD COSTS TOTAL				\$1,358,700			\$1,358,700
SUPERVISION - CONTRACTOR							
SMALL TOOLS & CONSUMABLES							
MISC. EQUIP. RENTAL							
TEMPORARY FACILITIES							
TEMPORARY UTILITY HOOK-UP							
JOB CLEAN-UP							
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)							
HEALTH PHYSICS S/C							
CERCLA - 40 HRs/FTE							
GET/SITE ACCESS & JOB SPECIFIC TRAINING							
PAYROLL BURDENS & BENEFITS	-	-					
OVERHEAD & PROFIT	-	-		\$271,700			\$271,700
BOND	-	-		\$16,300			\$16,300
SALES TAX	-	-					
INDIRECT FIELD COSTS TOTAL				\$288,000			\$288,000
DIRECT & INDIRECT FIELD COSTS TOTAL				\$1,646,700			\$1,646,700
WASTE MGMT. - F FERNALD							
OFF-SITE DISPOSAL COSTS (Commercial)							
WASTE MANAGEMENT COSTS TOTAL							
PROJECT MANAGEMENT - F FERNALD							
CONSTRUCTION MANAGEMENT - F FERNALD							
FD FERNALD FIELD SUPPORT COSTS TOTAL							
ENGINEERING/DESIGN/INSPECTION - F FERNALD							
ENGINEERING/DESIGN/INSPECTION - A/E							
ENGINEERING COSTS TOTAL							
SALES TAX - F FERNALD							
SUB-TOTAL (BASE ESTIMATE)							\$1,646,700
RISK BUDGET							
TARGET ESTIMATE							\$1,646,700
CONTINGENCY							
NTS BURIAL FEE							

ESTIMATE PERFORMED BY ESTIMATING SERVICES

S:\ESTIMATE\ROGER\2001SI - 1\CHEMIC - 1\DEMCSI - 1.WX4

ESTIMATE SUMMARY SHEET

PROJECT: SILOS D & D - 004
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FACTORS

DATE: 16-May-2001
 ESTIMATOR: J.ELLIS
 LOCATION: FERNALD
 TASK NO.: HS1AR

FIXED PRICE SUBCONTRACT	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS		\$1,358,700				\$1,358,700
IFC COST FACTOR		-			-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2120	1.2120	1.2120	1.2120	1.2120	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =		1.2120			1.2847	
BASE ESTIMATE \$'s		\$1,646,700				\$1,646,700
RISK BUDGET FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR		1.2120			1.2847	
FPS TARGET ESTIMATE (FY01 DOLLARS)		\$1,646,700				\$1,646,700

NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe. SEE De-Escalated Summary.
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G59.
- 3.) If F Fernald Support dollars appear below, and were generated as a percentage of the DFC, Risk Budget would apply and these dollars would be de-escalated to FY96. Indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the NO box.
 If the FF Support costs are supported by LOE estimates, use those estimates for input to microframe, enter 'SPACE BAR' in the Yes Box and an X in the No Box.

DOES RISK BUDGET APPLY TO FD FERNALD SUPPORT COSTS	YES	NO X	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
F FERNALD SUPPORT COSTS								
F FERNALD PROJECT MGMT. RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM								
F FERNALD CONSTRUCTION MGMT. RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL CM								
F FERNALD WASTE PROGRAM MGMT. RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM								
F FERNALD RSO RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO								
F FERNALD ENGINEERING/DESIGN/INSPECTION RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.								
A/E ENGINEERING/DESIGN/INSPECTION RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E								
SUB-TOTAL PROJECT TARGET EST. (FY01 DOLLARS)								\$1,646,700

If FF Support Costs were based on % defaults, indicate 'Yes' above. These costs are considered FY01 \$'s and Risk Budget applies.

If FF Support Costs were based on LOE estimates provided by the CAM's, indicate 'NO' and escalate the LOE dollars to FY01. Risk Budget will NOT apply. Separate the Sales Tax below.

The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

OTHER FD FERNALD SALES TAX - 6% RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER FD FERNALD SALES TAX							
TOTAL PROJECT TARGET EST. (FY01 DOLLARS)							\$1,646,700

ESTIMATE SUMMARY SHEET

PROJECT: SILOS D & D - 0U4
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Direct Field Cost w / FACTORS

DATE: 16-May-2001
 ESTIMATOR: J.ELLIS
 LOCATION: FERNALD
 TASK NO.: HS1AR

PAY ITEM NO.	DESCRIPTION	AND RISK BUDGET				PPE \$	TOTAL \$
		LABOR \$	S/C \$	MAT'L \$	EQUIP. \$		
	DEMOLITION of K-65 TRENCH		100600 \$121,920				100600 \$121,920
	DEMOLITION OF SILOS #1		273500 \$331,470				\$331,470
	RADON TREATMENT PLANT		164100 \$198,880				\$198,880
	DEMOLITION OF SILOS #2		273500 \$331,470				\$331,470
	DEMOLITION OF SILOS #3		273500 \$331,470				\$331,470
	DEMOLITION OF SILOS #4		273500 \$331,470				\$331,470
TOTAL DIRECT FIELD COSTS w/FACTORS							\$1,646,680

NOTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: SILOS D & D - 004
 C4-2001-05-009
 CLIENT: DOE
 1.1.H.D

DATE: 16-May-2001
 J.ELLIS
 LOCATION: FERNALD
 HSTAR

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS		Rate	COST / UNIT			LABOR	SIC	MATT'L	EQUIP	TOTAL	
				Unit	Total		S/C	Mat'l	Equip						
	DEMOLITION OF SILOS #1	1	LOT							\$273,500				\$273,500	
	RADON TREATMENT PLANT	1	LOT							\$184,100				\$184,100	
	DEMOLITION OF SILOS #2	1	LOT							\$273,500				\$273,500	
	DEMOLITION OF SILOS #3	1	LOT							\$273,500				\$273,500	
	DEMOLITION OF SILOS #4	1	LOT							\$273,500				\$273,500	
	DEMOLITION of K-85 TRENCH	1.0	LOT							\$100,800				\$100,800	
Subtotal Direct Cost															\$1,356,700

DETAIL ESTIMATE WORKSHEETS



PROJECT: SILOS D & D - 004
 C4-2001-05-009
 CLIENT: DOE
 1.1.H.D

DATE: 16-May-2001
 J.ELLIS
 FERNALD
 HS1AR
 LOCATION:

ITEM NO.	DEMOLITION OF SILOS #1	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Labor	SIC	Mat'l					
DECONTAM. & DECOMITION OF SILOS														
A. SILOS #1														
	1. Mobilization													
	2. Set-up rad area													
	3. Set equip. in place													
	4. Remove roof of Silo													
	5. Remove walls													
	6. Load into sealand/Haul OSDF area													
	TOTAL LABOR / EQUIP.		1 LOT				250000							\$273,500
	TOTAL LABOR / EQUIP. FOR RADON PLT		1 LOT				150000							\$164,100
B. SILOS #2														
	1. Set-up rad area													
	2. Set equip. in place													
	3. Remove roof of Silo													
	4. Remove walls													
	5. Load into sealand/Haul OSDF area													
	6. Clean up area													
	TOTAL LABOR / EQUIP.		1 LOT				250000							\$273,500
C. SILOS #3														
	1. Set-up rad area													
	2. Set-up equip. in place													
	4. Remove roof of Silo													
	5. Remove walls													
	6. Load into sealand/Haul OSDF area													
	TOTAL LABOR / EQUIP.		1 LOT				250000							\$273,500
C. SILOS #4														
	1. Set-up rad area													
	2. Set-up equip. in place													
	3. Remove Superstructure													
	4. Remove roof of Silo													
	5. Remove walls													
	6. Load into sealand/Haul OSDF area													
	TOTAL LABOR / EQUIP.		1 LOT				250000							\$273,500
	DEMOLITION of K-95 TRENCH		1.0 LOT				92000							\$100,600
Take-off Allowance														
Subtotal Direct Cost														
			1 LOT											\$1,368,700

APPENDIX "A"

PROJECT: SILOS D & D - 0U4
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

SITE SPECIFIC
 EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 16-May-2001
 ESTIMATOR: J.ELLIS
 LOCATION: FERNALD
 TASK NO.: HSTAR

	PERCENT OF INFLUENCE ON CHART MANHOURS										WTD VALUE	PROD. RESULT					
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE							
CRAFT SKILL (NOTE 1)	POOR			FAIR							STD	V.GOOD	EXCELLENT	100.0%	12.0%	0.12	
CRAFT AVAIL.(NOTE 1)		POOR		FAIR							STD			100.0%	8.0%	0.08	
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN						+40 TO +85			70.0%	20.0%	0.14	
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT						UNDER 5,000 FT			100.0%	5.0%	0.05	
WORK SPACE				200 SF	250 SF		300 SF				350 SF			100.0%	10.0%	0.1	
WORK WEEK											4-10s / 5-8s			100.0%	15.0%	0.15	
50 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS		UP TO 3 WEEKS							0.0%	0.0%	0	
60 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS		UP TO 3 WEEKS							0.0%	0.0%	0	
SHIFTWORK																	
2ND SHIFT					2ND SHIFT						OR ONE SHIFT ONLY			100.0%	3.0%	0.03	
3RD SHIFT				3RD SHIFT										100.0%	5.0%	0.05	
PROJECT SIZE					400M MH AND UP		300M TO 400M MH				200M TO 300M MH	200M MH OR LESS		105.0%	4.0%	0.042	
PLANT TYPE				REVAMP ONLY	REVAMP & NEW		NEW IN EXIST PLT				GRASS ROOTS			90.0%	8.0%	0.072	
AREA/UNION INFLUENCE	STRONG				SOME		NONE							40.0%	10.0%	0.04	
NOTES.....																	
1. TURNOVER HAS BEEN CONSIDERED																	
2. FOR EXTERIOR WORK ONLY																	
															100.0%		87.4%

EFFICIENCY (AS A % OFF CHART MANHOURS)

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S)

1.14

EFFICIENCY FACTORS

PROJECT: SILOS D & D - DU4
 ESTIMATE NO.: C4-2001-05-009
 DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-2001
 ESTIMATOR: J.ELLIS
 FERNALD
 TASK NO.: HSTAR



EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)	14%	14.0
S/T = BASE UNIT MANHOURS		114
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		114
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		114
• PPE SPECIFIC (Based on current data and estimating knowledge)		

PRODUCTIVITY HOURS (AS A %) / ADD MH's (AS A MULTIPLIER) / TOTAL HRS	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER
	5	71.00%	81	79.00%	90	147.00%	168	326.00%	372	
	118.6	1.71	194.9	1.79	204.1	2.47	281.6	4.28	485.6	
TOTAL MULTIPLIER w/SITE PROD.	1.1856		1.9494		2.0406		2.8158		4.8564	

NOTE: Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-0000 0.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
 (SEE APPENDIX C - HEALTH PHYSICS)

12.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	49.0	Man Days
------	----------	------	----------	------	----------	------	----------	------	----------

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: SILOS D & D - 004
 C4-2001-05-009
 CLIENT: DOE
 1.1.H.D

DATE: 16-May-2001
 LOCATION: FERNALD



PPE MULTIPLIER DEVELOPMENT

	D	mC	C	C +	B
CREW SIZE & MAKE-UP					
STANDARD	7	7	7	7	7
WORKER-BUDDY	0	0	0	0	0
SUPPORT TEAM	0	0	0	0	3
TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO	1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR	0.96	0.68	0.68	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR	1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO	0.96	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER	1.04	1.71	1.79	2.47	4.28

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDIT'L SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	4	4	4	4
	MINUTES	0	15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	3
	MINUTES	N/A	15	15	15	15
TOTAL		0	30	30	30	45
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL		0	60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS) 33.33%	QUANTITY	N/A	4	4	8	8
	MINUTES	N/A	15	15	15	15
TOTAL		0	20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL		0	0	0	40	40
AVAILABLE WORK TIME		575	405	405	325	290
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

ACTIVITY DURATIONS

FLUOR FERNALD

SILOS D & D - 004
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

16-May-2001
 ESTIMATOR: J.ELLIS
 LOCATION: FERNALD
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY DURATION
CONSTRUCTION:	06-May-01	01-Jan-04	31-Mar-04	30-Jun-04	6.0 MONTHS
					0 MONTHS
TOTAL					6.0 MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
a.	34.9 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY DURATION
OPERATIONS					0 MONTHS

DATE of EST. to MID-POINT OF ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

S:\ESTIMATE\ROGER\2001\SI-1\CHEMIC-1\DEMOSI-1.WK4

ESTIMATE SUMMARY SHEET

PROJECT: K-65 Trench
 ESTIMATE #: C4-2001-05-009
 CLIENT: DOE
 WBS #: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR

FLUOR FERNALD

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$	
Site Work	221		\$4,700				\$4,700	
Concrete	565		\$12,700				\$12,700	
0								
DIRECT FIELD COSTS TOTAL	785	\$22.15	\$17,400	\$0	\$0	\$0	\$17,400	
SUPERVISION - CONTRACTOR	695		\$15,400				\$15,400	
SMALL TOOLS & CONSUMABLES	-	-	-		\$1,000		\$1,000	
MISC. EQUIP. RENTAL	-	-	-			\$18,800	\$18,800	
TEMPORARY FACILITIES	31		\$700		\$700		\$1,400	
TEMPORARY UTILITY HOOK-UP	26		\$600		\$300		\$900	
JOB CLEAN-UP	35		\$800		\$300		\$1,100	
PER DIEM / SUBSISTANCE	-	-	-	\$0			\$0	
HEALTH PHYSICS S/C	18		\$400		\$0		\$400	
CERCLA - TRAINING	75		\$1,700				\$1,700	
GET/SITE ACCESS & JOB SPECIFIC TRAINING	72		\$1,600				\$1,600	
PAYROLL BURDENS & BENEFITS	-	-	\$22,000				\$22,000	
OVERHEAD & PROFIT	-	-	-	\$16,300			\$16,300	
BOND	-	-	-	\$1,300			\$1,300	
SALES TAX	-	-	-		\$200	\$1,100	\$1,300	
INDIRECT FIELD COSTS TOTAL	952		\$43,200	\$17,600	\$2,500	\$19,900	\$83,200	
DIRECT & INDIRECT FIELD COSTS TOTAL	1,738	\$34.87	\$60,600	\$17,600	\$2,500	\$19,900	\$100,600	
TARGET ESTIMATE							(FY 01 DOLLARS)	\$100,600

ESTIMATE PERFORMED BY ESTIMATING SERVICES

ESTIMATE SUMMARY SHEET

PROJECT: K-65 Trench
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR

FACTORS

FIXED PRICE \$	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$17,400	\$0	\$0	\$0	\$0	\$17,400
IFC COST FACTOR	4.7700	-	0.0000	0.0000	-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2120	1.2120	1.2120	1.2120	1.2120	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	5.7815	1.2120	0.0000	0.0000	1.2848	
BASE ESTIMATE \$'s	\$100,598	\$0	\$0	\$0	\$0	\$100,598
BASE FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	5.7815	1.2120	0.0000	0.0000	1.2848	
FPS TARGET ESTIMATE (FY00 \$)	\$100,598	\$0	\$0	\$0	\$0	\$100,598

NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe. SEE De-Escalated Summary.
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G65.

The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: K-65 Trench
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS		Rate	COST / UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total		Labor	S/C	Mat'l					
	Site Work Concrete				221 565					\$4,700 \$12,700				\$4,700 \$12,700
Subtotal Direct Cost														\$17,400
														\$0
														\$0
														\$0
														\$17,400

APPENDIX "A"

PROJECT: K-65 Trench
 ESTIMATE NO: 4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

SITE SPECIFIC
 EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HSTAR

PERCENT OF INFLUENCE ON CHART MANHOURS

	PERCENT OF INFLUENCE ON CHART MANHOURS						WT'D VALUE	PROD. RESULT				
	40%	50%	60%	70%	80%	90%			100%	105%	110%	% OF INFLUENCE
CRAFT SKILL (NOTE 1)	POOR	POOR		FAIR			STD	V.GOOD	XCELLENT	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			90.0%	20.0%	0.18
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	5.0%	0.05
WORK SPACE				200 SF	250 SF	300 SF	350 SF			100.0%	10.0%	0.1
WORK WEEK							4-10s / 5-8s			100.0%	15.0%	0.15
50 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
60 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0.0%	0
SHIFTWORK							2ND SHIFT					
2ND SHIFT							OR					
3RD SHIFT			3RD SHIFT				ONE SHIFT ONLY			100.0%	3.0%	0.03
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		100.0%	4.0%	0.04
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	8.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
NOTES.....											100.0%	91.2%

1. TURNOVER HAS BEEN CONSIDERED
 2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS)

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S)

91.2%

1.10

EFFICIENCY FACTORS

PROJECT: K-65 Trench
 ESTIMATE NO. C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR



EXAMPLE:

STANDARD CHART MANHOURS = NET 100
 EFFICIENCY FACTORS:
 * SITE SPECIFIC (SEE APPENDIX A) 10.0
 S/T = BASE UNIT MANHOURS 110

OVERTIME PRODUCTIVITY FACTOR 0.00% 0
 (SEE DETAIL WORKSHEET BACK-UP) 110

* TASK SPECIFIC (confined space, high elevation, congestion, etc.) 0.00% 0
 110

* PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'D'		Mod. "C"		C		C+	
PRODUCTIVITY HOURS	MH's		MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A %) / ADD MH's	4.00%	4	28.00%	31	66.00%	73	74.00%	81	96.00%	106
(AS A MULTIPLIER) / TOTAL HR's	1.04	114.4	1.28	140.8	1.66	182.6	1.74	191.4	1.96	215.6
TOTAL MULTIPLIER w/SITE PROD.	1.144		1.408		1.826		1.914		2.156	
<p>NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined. (SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)</p> <p>Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's. (SEE APPENDIX C - HEALTH PHYSICS)</p>										
	11.0	Man Days	14.0	Man Days	18.0	Man Days	19.0	Man Days	22.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: K-65 Trench
 ESTIMATE NO. C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE MULTIPLIER DEVELOPEMENT

	D	mD	mC	C	C+
CREW SIZE & MAKE-UP					
STANDARD	7	7	7	7	7
WORKER-BUDDY	0	0	0	0	0
SUPPORT TEAM	0	0	0	0	0
TOTAL CREW	7	7	7	7	7
CREW SIZE RATIO	1.00	1.00	1.00	1.00	1.00
AVAILABLE WORK TIME FACTOR	0.96	0.78	0.7	0.7	0.68
PPE LABOR PRODUCTIVITY FACTOR	1	1	0.86	0.82	0.75
NET PRODUCTIVITY RATIO	0.96	0.78	0.602	0.574	0.51
NET PRODUCTIVITY MULTIPLIER	1.04	1.28	1.66	1.74	1.96

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mD	mC	C	C+
TOTAL WORK MINUTES per D 4 - 10's		600	600	600	600	600
ADDITNL.SITE SAFETY MEETINGS NOT INCLD. IN BASE	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	0	3	3	3
	MINUTES	0	0	15	15	20
TOTAL		0	0	45	45	60
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	2
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	30
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	20	20
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	N/A	N/A
	MINUTES	N/A	N/A	N/A	N/A	N/A
TOTAL						
AVAILABLE WORK TIME		575	465	420	420	405
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

FLUOR FERNALD

PROJECT: K-65 Trench
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY			
			Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)	MAN DAYS	MAT'L.\$'s	PPE LEVEL
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		\$'s	*			
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	0	\$0	C / C+
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	0	\$0	C / C+
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	C / C+
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	C / C+
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	C / C+
APR CARTRIDGES - DISPOSABLE	PR	6.98	3	0	\$0	C / C+
SUB-TOTAL		17.42	3		\$0	

(DOUBLE PPE)

\$/MD = \$0.00

PPE LEVEL mC						
DESCRIPTION	UNIT	\$'s	MAN DAYS	MAT'L.\$'s	PPE LEVEL	
FULL DRESS w/ FACE SHIELD		\$'s				
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	3	0	\$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	mC
SUB-TOTAL		5.98	3		\$0	

\$/MD = \$0.00

SUBCONTRACTOR REQUIRED PURCHASES	UNIT	QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	\$0 D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	\$0 C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	\$0 C
SCBA	EA	1894.00	2	0	\$0 B
COOL VESTS	EA	137.50	6	0	\$0 C/B
THERMO STRIPS	EA	50.00	6	0	\$0 C/B
SUB-TOTAL					\$0

MAT'L.\$'s
\$0

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: K-65 Trench
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR

-MEDICAL MONITORING -

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASILINE PHYSICALS	1	4	3	12	\$22.15	\$270
ANNUAL PHYSICALS	0	4	3	0	\$22.15	\$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	3	3	\$22.15	\$70
SUB-TOTAL						\$340

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	2	1	3	5	\$22.15	\$100
SUB-TOTAL						\$100

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR \$'s	
	1	2	2	\$22.15	\$0	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.004274	4	0.0171	58

LABOR \$'s THRU SAFETY LABOR \$'s

WORK DELAYS CAUSED BY MONITORING	0.0%	\$34,900	\$0
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LABOR \$'s

WORK DELAYS CAUSED BY RAD CHECKING	0.0%	\$34,900	\$0
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TOTAL LABOR TOTAL MAT'L GRAND TOTAL

TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	\$400	\$0	\$400
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ACTIVITY DURATIONS

FLUOR FERNALD

PROJECT: K-65 Trench
 ESTIMATE NO.: C4-2001-05-009
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Name
 LOCATION: Fernald
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	10-May-01	01-Jun-04	17-Jul-04	01-Sep-04		3.0 MONTHS
						0 MONTHS
TOTAL						3.0 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
a.	38.3 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS						0 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLASAT TRAINING HOURS and HEALTH PHYSICS COSTS.

ESTIMATE REVIEW FORM

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4-2001-05-008
CLIENT: DOE
WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 16-May-01
ESTIMATOR: T Wagner/Johnson
LOCATION: FERNALD
TASK NO.: HSIAR

COMPLETE ESTIMATE PACKAGE YES _____ NO X _____

REQUIRED DOCUMENTS _____

COMMENTS: Upgrade to an existing estimate to be costed to 2001 dollars

REVIEWERS SIGNATURE _____ DATE _____

RESOLUTION: _____

ESTIMATOR: _____ DATE _____

REVIEWER: _____ DATE _____

ESTIMATE REVIEW FORM

PROJECT: Vendor "B" (TTA/RCS D & D)
ESTIMATE NO.: C4-2001-05-008
CLIENT: DOE
WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 16-May-01
ESTIMATOR: T Wagner/Johnson
LOCATION: FERNALD
TASK NO.: HSTAR

OTHER REVIEWS:

REQUESTER

DATE

CAM if > \$100,000

DATE

PROJ.MGR. if > \$ 1M

DATE

ESTIMATING SERVICES

TEAM COACH

 _____

DATE

5/16/01

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Vendor "B" (TTA/RCS D & D)

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-2001-05-008

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input type="checkbox"/>	Equipment List	<input type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input checked="" type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input checked="" type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4-2001-05-008 is to up-grade a previous estimate to get the costs in 2001 dollars.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Vendor "B" (TTA/RCS D & D)

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4-2001-05-008

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
 - Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

WASTE PROGRAM MANAGEMENT:

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- Waste Program Management dollars provided by the Project Engineer.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION:) Vendor "B" (TTA/RCS D & D)
WBS: 1.1.H.D
PROJECT ENGINEER: Jeff Stone
ESTIMATOR: R Johnson
ESTIMATE NUMBER: C4-2001-05-008

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

A (HO EXPENSE

expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

**G &
This**

HEALTH PHYSICS:

See Attached Appendix "C"

RISK

BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Vendor "B" (TTA/RCS D & D)
WBS: 1.1.H.D
PROJECT ENGINEER: Jeff Stone
ESTIMATOR: R Johnson
ESTIMATE NUMBER: C4-2001-05-008

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The D & D estimate was the primary source to up-grade the cost to 2001 dollars

EXCLUSIONS:

- Permits and fees.
- FFS G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
-

ESTIMATE SUMMARY SHEET

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

Fluor Fernald, Inc.

ITEM NO.7	ITEM DESCRIPTION	MH	RATE	LABOR \$	SIC \$	MAT'L \$	EQUIP. \$	TOTAL \$
	Premobilization/Mobilization	820		\$18,600		\$15,100	\$800	\$34,500
I	Full Scale Mock-up System	1,140		\$24,500				\$24,500
II	RCS Phase I, II, & III	1,743		\$37,400				\$37,400
III	Silo Waste Retrieval System	2,204		\$47,400				\$47,400
IV	Transfer Tank Area	4,521		\$97,100				\$97,100
	Demobilization Cost	1,400		\$30,600	\$8,800	\$2,700	\$3,700	\$45,800
DIRECT FIELD COSTS TOTAL		11,828	\$21.61	\$255,600	\$8,800	\$17,800	\$4,500	\$286,700
SUPERVISION - CONTRACTOR - STAFF		8,960		\$222,000				\$222,000
SMALL TOOLS & CONSUMABLES @ 3%						\$7,700		\$7,700
MISC. EQUIP. RENTAL (See Equipment Schedule)							\$294,500	\$294,500
PERDIEM / SUBSISTANCE					\$81,300			\$81,300
TEMPORARY FACILITIES & UTILITIES		532		\$11,500		\$11,500		\$23,000
JOB CLEAN-UP 6%		532		\$11,500		\$3,800		\$15,300
SAFETY 3%		231		\$5,000		\$2,700		\$7,700
HEALTH PHYSICS SIC		1,143		\$24,700		\$11,000		\$35,700
CERCLA - 40 HRs/FTE		760		\$16,400				\$16,400
GET/SITE ACCESS & JOB SPECIFIC TRAINING		380		\$8,200				\$8,200
PAYROLL BURDENS & BENEFITS		-	-	\$316,300				\$316,300
OVERHEAD & PROFIT		-	-		\$263,000			\$263,000
BOND		-	-		\$15,800			\$15,800
SALES TAX		-	-			\$3,300	\$17,900	\$21,200
INDIRECT FIELD COSTS TOTAL		12,538		\$615,600	\$360,100	\$40,000	\$312,400	\$1,328,100
DIRECT & INDIRECT FIELD COSTS TOTAL		24,366	\$35.75	\$871,200	\$368,900	\$57,800	\$316,900	\$1,614,800
WASTE DISPOSITION - MGMT. - F FERNALD								
WASTE MANAGEMENT COSTS TOTAL								
PROJECT MANAGEMENT - FLUOR FERNALD								
FIELD PREPARATION								
PROJECT CLOSE OUT								
F-FERNALD FIELD SUPPORT COSTS TOTAL								
ENGINEERING, PLANNING, PROCUREMENT - FLUOR FERNALD								
ENGINEERING, PLANNING & PROCUREMENT COSTS TOTAL								
SALES TAX - FLUOR FERNALD								
SUB-TOTAL (BASE ESTIMATE)								\$1,614,800
RISK BUDGET								
TARGET ESTIMATE ITEM NO. 7 (FY 01 DOLLARS)								\$1,614,800
NTS BURIAL FEE ITEM NO.30								

ESTIMATE PERFORMED BY ESTIMATING SERVICES

S:\ESTIMATE\Roger\2001 Silo estimate\TTA-RCS\RCSS\Summary

ESTIMATE SUMMARY SHEET

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FACTORS

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

FIXED PRICE SUBCONTRACT	LABOR \$	SC \$	MATL. \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$255,600	\$90,100	\$17,800	\$4,500	\$11,000	\$379,000
IFC COST FACTOR	3.4085		2.4438	66.4444	--	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2087	1.2087	1.2087	1.2087	1.2087	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	4.1197	1.2087	3.1310	85.1289	1.2812	
BASE ESTIMATE \$*	\$1,053,004	\$108,902	\$55,732	\$383,080	\$14,093	\$1,614,812
RISK BUDGET FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	4.1197	1.2087	3.1310	85.1289	1.2812	
FPS TARGET ESTIMATE (FY01 DOLLARS)	\$1,053,004	\$108,902	\$55,732	\$383,080	\$14,093	\$1,614,812

NOTE:

- The above costs represent constant FY dollars and require de-escalation to FY96 for input to microframe.
- If there are no equipment rental costs in the "Directs" and the default allowance has been used in the "indirects", input the equipment dollars on page 3 in the equipment column and appropriate pay items. Either the total dollars can be input against one pay item or calculate the man-hours times \$3.50 per manhour for each pay item. The 'direct field cost factor' above, will be 1.06 for sales tax time the factor for bond, overhead and profit. To eliminate the 'ERR' in the IFC factor for Equipment (G59), insert a zero. Adjust the Direct Field Cost Factor (G63) by deleting the '*G59*' in the formula.
- The FD Fernald Support costs below will be supported by LOE estimates or as a percent of the Direct Field Cost. If the percent method is used, indicate an 'X' in the 'YES' box and enter 'SPACE BAR' in the 'NO' box. Reverse this for LOE estimates.

DOES RISK BUDGET APPLY TO FD FERNALD SUPPORT COSTS ?	YES	NO X	LABOR \$	SC \$	MATL. \$	EQUIP. \$	PPE \$	TOTAL \$
FD FERNALD SUPPORT COSTS								
WASTE DISPOSITION - MGMT. - F FERNALD RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM								
RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL CM								
PROJECT MANAGEMENT - FLUOR FERNALD RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM								
FIELD PREPARATION RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO								
PROJECT CLOSE OUT RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.								
ENGINEERING, PLANNING, PROCUREMENT - FLUOR FERNALD RISK BUDGET FACTOR			1.00	1.00	1.00	1.00	1.00	1.00
TOTAL AE								
SUB-TOTAL PROJECT TARGET EST. (FY01 DOLLARS)								\$1,614,812

If 'YES' is indicated above, these costs are considered constant FY dollars and require de-escalation to FY96 for input to microframe and include risk budget. Otherwise, see the LOE estimates for actual input values to Microframe. These dollars will not match microframe reports due to differences in labor rates and constant FY dollars for other costs and the addition of escalation and G & A to the microframe reports. Risk Budget requirements for F Fernald Support Costs needs to be determined on an individual basis for each project they support and may not apply if supported by an LOE estimate. The sales tax below may be included in the LOE estimates above. Choose where to show sales tax and whether Risk allowance applies.

SALES TAX - FLUOR FERNALD RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER F FERNALD SALES TAX								
TOTAL PROJECT TARGET EST. (FY01 DOLLARS)								\$1,614,812

ESTIMATE SUMMARY SHEET

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Direct Field Cost
 w/FACTORS

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

PAY ITEM NO.	DESCRIPTION	LABOR \$	S/C \$	MATL. \$	EQUIP. \$	PPE \$	TOTAL \$
						11000	
ITEM NO.7	Premobilization/Mobilization	18600	6557	15100	327	800	41384,75893
		\$76,630	\$7,930	\$47,280	\$27,880	\$1,030	\$160,750
I	Full Scale Mock-up System	24500	8636		431	1054	34621,65886
		\$100,930	\$10,440		\$36,720	\$1,350	\$149,440
II	RCS Phase I, II, & III	37400	13184		658	1610	
		\$154,080	\$15,930		\$56,050	\$2,060	\$228,120
III	Silo Waste Retrieval System	47400	16709		835	2040	
		\$195,280	\$20,200		\$71,040	\$2,610	\$289,130
IV	Transfer Tank Area	97100	34228		1710	4179	
		\$400,030	\$41,370		\$145,530	\$5,350	\$592,280
	Demobilization Cost	30600	10786	2700	539	1317	
		\$126,060	\$13,040	\$8,450	\$45,860	\$1,690	\$195,100
TOTAL DIRECT FIELD COSTS w/FACTORS (FY01 DOLLARS)							\$1,614,820

NOTE: The above costs exclude any FD Fernald support costs that may appear on page 1 & 2, such as Waste Disposition, Engineering, Project Management, or Construction Management.

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS			COST / UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL		
				Unit	Total	Rate	Labor	S/C	Mat'l						Equip	
I	Mobilization Cost				820				\$18,800		\$15,100	\$800	\$34,500			
II	Full Scale Mock-up System				1,140				\$24,500				\$24,500			
III	RCS Phase I, II, & III				1,743				\$37,400				\$37,400			
IV	Silo Waste Retrieval System				2,204				\$47,400				\$47,400			
	Transfer Tank Area				4,521				\$97,100				\$97,100			
	Demobilization Cost				1,400				\$30,800	\$8,800	\$2,700	\$3,700	\$45,800			
Subtotal Direct Cost														\$17,800	\$4,500	\$286,700

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnneon
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
7													
D	355	cy	1.400	685	21.48			\$14,710				\$14,710	
A	9.2	tn	7	129	21.48			\$2,770				\$2,770	
B	0.4	tn	7	6	21.48			\$130				\$130	
C	0.7	tn	7	10	21.48			\$210				\$210	
C	4	tn	7	56	21.48			\$1,200				\$1,200	
C	0.4	tn	7	6	21.48			\$130				\$130	
C	2	tn	7	28	21.48			\$600				\$600	
C	0.6	tn	7	8	21.48			\$170				\$170	
D	1	tn	7	10	21.48			\$210				\$210	
D	0.2	tn	7	2	21.48			\$40				\$40	
C	400	lf	0.127	102	21.48			\$2,190				\$2,190	
C	150	lf	0.151	45	21.48			\$970				\$970	
C	0.6	tn	7	8	21.48			\$170				\$170	
C	0.4	tn	7	6	21.48			\$130				\$130	
C	0.1	tn	7	1	21.48			\$20				\$20	
C	0.3	tn	7	4	21.48			\$90				\$90	
C	0.1	tn	7	1	21.48			\$20				\$20	
C	0.1	tn	7	1	21.48			\$20				\$20	
C	0.1	tn	7	1	21.48			\$20				\$20	
C	500	lf	0.021	21	21.48			\$450				\$450	
C	100	lf	0.033	7	21.48			\$150				\$150	
<p>Take-off Allowance</p>												\$2,440	
<p>Subtotal Direct Cost</p>												\$26,800	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
7		RCS Phase I, II, & III con't.											
C	600	If	0.053	64	21.48			\$1,370				\$1,370	
D	111	cy	0.459	70	21.48			\$1,500				\$1,500	
D	50	cy	3.603	248	21.48			\$5,330				\$5,330	
D	37	cy	0.400	20	21.48			\$430				\$430	
D	90	cy	0.368	45	21.48			\$970				\$970	
Take-off Allowance			10%	45				\$960				\$960	
Subtotal Direct Cost				48				\$10,500				\$10,500	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	QTY	UNIT	MAN-HOURS			Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL		
			Unit	Total			Labor	S/C	Mat'l						Equip	
7																
D	6	tn	7	58		21,48			\$1,250				\$1,250			
D	6	tn	7	58		21,48			\$1,250				\$1,250			
D	6	tn	7	58		21,48			\$1,250				\$1,250			
D	6	tn	7	58		21,48			\$1,250				\$1,250			
D	6	tn	7	58		21,48			\$1,250				\$1,250			
D	0.4	tn	7	4		21,48			\$90				\$90			
													\$630		\$630	
Take-off Allowance																
Subtotal Direct Cost													\$630			\$630

DETAIL ESTIMATE WORKSHEETS

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: H61AR

Fluor Fernald, Inc.

ITEM NO.	DESCRIPTION	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l					
7	Transfer Tank Area													
C A	Storage Tanks 68'dia x 30'h	220	tn	2.700	1191	21.48			\$25,580				\$25,580	
C B	Decant Tank 38'dia x 30'h	34.2	tn	2.700	185	21.48			\$3,970				\$3,970	
D C	Structure w/Metal Roof	112.5	tn	2.700	419	21.48			\$9,000				\$9,000	
D D	w/ 12" concrete Floor	833	cy	0.459	527	21.48			\$11,320				\$11,320	
D D	w/ 2' concrete Walls	1600	cy	0.400	882	21.48			\$18,950				\$18,950	
D D	w/ 3' RA conc Slab - Operating D	625	cy	0.459	395	21.48			\$8,480				\$8,480	
D D	Concrete footers	286	cy	0.386	134	21.48			\$2,880				\$2,880	
D D	Sampling System Enclosure @2'	104	cy	0.400	57	21.48			\$1,220				\$1,220	
D D	Slurry Sample & Storage Bldg (3 W	55	cy	0.400	30	21.48			\$640				\$640	
D E	Raw Water Tank	3.2	tn	3	12	21.48			\$260				\$260	
F	Mechanical Systems - Pumps													
C	- TTA Transfer	0.4	tn	7	6	21.48			\$130				\$130	
C C	- Makeup Water	0.1	tn	7	1	21.48			\$20				\$20	
C C	- Sump	0.1	tn	7	1	21.48			\$20				\$20	
C C	- Sluice	0.1	tn	7	1	21.48			\$20				\$20	
C C	- HPU Pump	0.1	tn	7	1	21.48			\$20				\$20	
C C	- Piping	750	lf	0.053	80	21.48			\$1,720				\$1,720	
D G	Electrical - MCC #2	3	cy	0.459	2	21.48			\$40				\$40	
D H	Lighting , Conduit	2000	lf	0.033	91	21.48			\$1,950				\$1,950	
D D	Cable Tray	500	lf	0.021	14	21.48			\$300				\$300	
D J	Heat (personal) Unit Htrs	0.4	tn	7	4	21.48			\$90				\$90	
C K	Ductwork	300	lf	0.127	76	21.48			\$1,630				\$1,630	
C M	Decant Sump	0.1	tn	7	1	21.48			\$20				\$20	
Take-off Allowance				10%	411				\$8,830				\$8,830	
Subtotal					222				\$7,180				\$7,180	
Grand Total					411				\$15,810				\$15,810	

PROJECT: Vendor "B" (TTA/RCSD & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

SITE SPECIFIC
 EFFICIENCY / MULTIPLIER ANALYSIS

	PERCENT OF INFLUENCE ON CHART MANHOURS										WT'D VALUE	PROD. RESULT	
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE			
CRAFT SKILL (NOTE 1)	POOR			FAIR							EXCELLENT	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR							V.GOOD	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN						+40 TO +85	20.0%	0.18
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT						UNDER 5,000 FT	5.0%	0.05
WORK SPACE		<--- MULTIPLE SHIFTS.		200 SF	250 SF		300 SF				350 SF	10.0%	0.1
WORK WEEK											4-10s / 5-8s	15.0%	0.15
50 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS		UP TO 3 WEEKS						
60 HOUR WORK WEEK				3 TO 7 WEEKS	UP TO 3 WEEKS								
SHIFTWORK													
2ND SHIFT					2ND SHIFT						OR ONE SHIFT ONLY	3.0%	0.03
3RD SHIFT					3RD SHIFT							5.0%	0.05
PROJECT SIZE											200M MH OR LESS	4.0%	0.042
PLANT TYPE					REVAMP & NEW		NEW IN EXIST PLT				GRASS ROOTS	8.0%	0.072
AREA/JUNION INFLUENCE	STRONG				SOME						NONE	10.0%	0.04
												100.0%	89.4%

NOTES.....
 1. TURNOVER HAS BEEN CONSIDERED
 2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS) 89.4%
 MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S) 1.12

EFFICIENCY FACTORS

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HSIAR

Fluor Fernald, Inc.

EXAMPLE:

STANDARD CHART MANHOURS -	NET	100
EFFICIENCY FACTORS:		
• SITE SPECIFIC (SEE APPENDIX A)		12.0
S/T - BASE UNIT MANHOURS		112
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)		112
• TASK SPECIFIC (confined space, high elevation, congestion, etc.)		112
• PPE SPECIFIC (Based on current data and estimating knowledge)		

PRODUCTIVITY HOURS (AS A %) / ADD MH's	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
(AS A MULTIPLIER) / TOTAL HRS	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER
23.00%	28	71.00%	80	78.00%	88	147.00%	185	328.00%	385	
1.23	137.8	1.71	181.5	1.79	200.5	2.47	278.8	4.26	477.1	
TOTAL MULTIPLIER w/SITE PROD.	1.3778		1.8152		2.0048		2.7884		4.7712	
<p>NOTE: Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.</p> <p>(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 B.10)</p> <p>Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's. (SEE APPENDIX C - HEALTH PHYSICS)</p>										
	14.0	Man Days	19.0	Man Days	20.0	Man Days	28.0	Man Days	48.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL. TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

HEALTH PHYSICS

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 18-May-
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY			
			ed in PPE's Div. by WORK HOURS / DAY			
C+ / B : F/HF MASK w/RESP.& CART.		\$'s	*	MAN DAYS	MAT'L.\$'s	LEVEL
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	124	\$2,212	C / C+ / B
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4	124	\$2,212	C / C+ / B
GLOVE LINER - DISPOSABLE	PR	0.24	4	124	\$119	C / C+ / B
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	124	\$129	C / C+ / B
GLOVE, WORK - DISPOSABLE	PR	1.02	4	124	\$506	C / C+ / B
APR CARTRIDGES - DISPOSABLE	PR	11.74	4	124	\$5,823	C / C+ / B
SUB-TOTAL		22.18	4		\$11,001	

(DOUBLE PPE)

\$/MD = \$88.72

PPE LEVEL mC

DESCRIPTION	UNIT	\$'s	MAN DAYS	MAT'L.\$'s	LEVEL
LDRESS w/ FACE SHIELD					
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	4		mC
GLOVE LINER - DISPOSABLE	PR	0.24	4		mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4		mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4		mC
SUB-TOTAL		5.98	4		

\$/MD = #DIV/0!

SUBCONTRACTOR REQUIRED PURCHASES	UNIT	COST	QTY. PER WKR.	NO. OF WORKERS	LEVEL
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6		D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6		C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6		C
SCBA	EA	1894.00	2		B
COOL VESTS	EA	137.50	6		C/B
THERMO STRIPS	EA	50.00	6		C/B
SUB-TOTAL					

MAT'L.\$'s
\$11,000

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

EFFICIENCY FACTORS

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: CA-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

Fluor Fernald, Inc.

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY					
	SUPPORT TEAM					3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.81	0.88	0.88	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.88	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.81	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.23	1.71	1.79	2.47	4.28
<p>These factors were based on Tables 8.1 and 8.2, Moderate Work Efforts, 86F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Salg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).</p>						
AVAILABLE WORK TIME FACTOR						
TOTAL WORK MINUTES per DAY - 4 - 10's		800	800	800	800	800
ADDITIONAL SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY		4	4	4	4
	MINUTES		15	15	20	25
TOTAL			80	80	80	100
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	2	2	2	2	3
	MINUTES	15	15	15	15	15
TOTAL		30	30	30	30	45
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	4	4	4	4	4
	MINUTES	15	15	15	15	15
TOTAL		60	60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS) 33.33%	QUANTITY	N/A	4	4	8	8
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL					40	40
AVAILABLE WORK TIME		485	405	405	325	280
AVAILABLE WORK TIME FACTOR		0.81	0.88	0.88	0.54	0.48

NOTE: Adjust "Work Minutes per Day" basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

HEALTH PHYSICS

PROJECT: LOCOMOTIVE MAINTENANCE BLDG.
& RAIL SPUR
ESTIMATE NO.: C4-2001-05-008
CLIENT: DOE
WBS NO.: 1.1.H.D

DATE: 18-May-
ESTIMATOR: T Wagner/Johnson
LOCATION: FERNALD
TASK NO.: H51AR

Fluor Fernald, Inc.

--MEDICAL MONITORING --

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	19	76	\$21.61	\$1,640
ANNUAL PHYSICALS		4	19		\$21.61	
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	19	19	\$21.61	\$410
SUB-TOTAL						\$2,050

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	4	1	19	85	\$21.61	\$1,840
SUB-TOTAL						\$1,840

RANDOM DRUG TESTING

WKR	TESTS	HRS	TOTAL HOURS	LABOR \$'s		
11	14	2	28	\$600		
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2500	226	11	0.0044	19	0.0836	17

WORK DELAYS CAUSED BY MONITORING	2.0%	LABOR \$'s THRU SAFETY	LABOR \$'s	
		\$505,600	\$10,100	
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	LABOR \$'s	LABOR \$'s	
		\$505,600	\$10,100	
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET		TOTAL LABOR	TOTAL MAT'L	GRAND TOTAL
		\$24,700	\$11,000	\$35,700

S:\ESTIMATE\Roger\2001 Site estimates\TTA-RCS\RC3.xls\Summary

ACTIVITY DURATIONS

Fluor Fernald, Inc.

PROJECT: Vendor "B" (TTA/RCS D & D)
 ESTIMATE NO.: C4-2001-05-008
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: T Wagner/Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	6-May-1	01-Jan-06	17-May-06	01-Oct-06		9.0 MONTHS
						MONTHS
TOTAL						9.0 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
a.	1278.1 MONTHS
b.	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS						MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

S:\ESTIMATE\Roger\2001 Silo estimates\TTA-RCS\RCS.xls]Summary

Memorandum

To:	Jeff Stone, MS52-4	Date:	May 16, 2001
Location:	Fernald 	Reference:	N/A
From:	Ken Kepler, MS80-3	Fernald #:	M:OOTP(PC/EST):2001-0071
Location:	Springdale	Client:	DOE DE-AC24-01OH20115
Extension:	648-6767	Subject:	VITRIFICATION PILOT PLANT DEMOLITION

c: File Record Subject ESTIMATE C4-2001-05-010
Dennis Nixon, MS52-4

Attached are two (2) copies for the VITRIFICATION PILOT PLANT DEMOLITION.

To request any additional copies of this estimate or for any questions, please contact Roger Johnson on extension 4140.

KGK:RLJ:hmp
Attachment

ESTIMATE REVIEW FORM

PROJECT: Vitrification Pilot Plant Demolition
ESTIMATE NO. C4-01-05-010
CLIENT: DOE
WBS NO.: 1.1.H.D

DATE: 15-May-01
ESTIMATOR: James J. Ellis
LOCATION: Fernald
TASK NO.: HS1AR

OTHER REVIEWS: _____

REQUESTER _____

DATE _____

CAM if > \$100,000 _____

DATE _____

PROJ.MGR. if >\$ 1M _____

DATE _____

ESTIMATING SERVICES
TEAM COACH 

DATE 05/15/01

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION:) Demolition **Of The Pilot Plant**

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.010

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input type="checkbox"/>	Equipment List	<input type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input checked="" type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4.01.05.010 is to up-grade a previous estimate to get the costs in 2001 dollars.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION:) Demolition Of The Pilot Plant

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.010

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
- Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

WASTE PROGRAM MANAGEMENT:

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- Waste Program Management dollars provided by the Project Engineer.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION:) Demolition Of The Pilot Plant

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.010

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

G & A (HO EXPENSE

This expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

HEALTH PHYSICS:

See Appendix "C"

RISK BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 15, 2001

PROJECT DESCRIPTION:) Demolition Of The Pilot Plant

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.010

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The D & D estimate was the primary source to up-grade the cost.
-

▪ **EXCLUSIONS:**

- Permits and fees.
- FFS G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
-

ESTIMATE SUMMARY SHEET

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 16-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
PREMOBILIZATION	2,560		\$61,700		\$2,300		\$64,000
MOBILIZATION	560		\$12,700			\$400	\$13,100
CONCRETE / STRUCTURAL DEMOLITION	5,074		\$113,800				\$113,800
EQUIPMENT DEMOLITION	4,301		\$101,400				\$101,400
DEMObILIZATION	850		\$19,200		\$200		\$19,400
DIRECT FIELD COSTS TOTAL	13,345	\$23.14	\$308,800		\$2,500	\$400	\$311,700
SUPERVISION - CONTRACTOR	10,010		\$262,763				\$262,763
SMALL TOOLS & CONSUMABLES					\$18,500		\$18,500
MISC. EQUIP. RENTAL (See Equipment Schedule)						\$320,300	\$320,300
TEMPORARY FACILITIES	400		\$9,300		\$9,300		\$18,600
TEMPORARY UTILITY HOOK-UP	260		\$6,000		\$3,200		\$9,200
JOB CLEAN-UP	601		\$13,900		\$4,600		\$18,500
PER DIEM / SUBSISTANCE							
HEALTH PHYSICS S/C	1,245		\$28,800		\$10,700		\$39,500
CERCLA - TRAINING	400		\$9,300				\$9,300
GET/SITE ACCESS & JOB SPECIFIC TRAINING	288		\$6,700				\$6,700
PAYROLL BURDENS & BENEFITS	-	-	\$368,000				\$368,000
OVERHEAD & PROFIT	-	-		\$276,600			\$276,600
BOND	-	-		\$16,600			\$16,600
SALES TAX	-	-			\$2,900	\$19,200	\$22,100
INDIRECT FIELD COSTS TOTAL	13,204		\$704,800	\$293,200	\$49,200	\$339,500	\$1,386,700
DIRECT & INDIRECT FIELD COSTS TOTAL	26,549	\$38.18	\$1,013,600	\$293,200	\$51,700	\$339,900	\$1,698,400
WASTE DISPOSITION MGMT. - FF							
SOLID WASTE BURIAL FEE							
WASTE MANAGEMENT COSTS TOTAL							
CONSTRUCTION MANAGEMENT - FF							
PROJECT MANAGEMENT - FF							
PROJECT CLOSEOUT - FF							
F FERNALD FIELD SUPPORT COSTS TOTAL							
ENGINEERING/PLANNING/PROCUREMENT - FF							
ENGINEERING COSTS TOTAL							
SALES TAX - F FERNALD 6%							
SUB-TOTAL (BASE ESTIMATE)							\$1,698,400
RISK BUDGET							
TARGET ESTIMATE							\$1,698,400
(FY 01 DOLLARS)							
CONTINGENCY							

ESTIMATE PERFORMED BY ESTIMATING SERVICES

ESTIMATE SUMMARY SHEET

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FACTORS

DATE: 16-May-01
 ESTIMATOR: ames J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

FIXED PRICE \$	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$308,800		\$2,500	\$400	\$10,700	\$322,400
IFC COST FACTOR	3.2824	-	15.2400	801.7500	-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2087	1.2087	1.2087	1.2087	1.2087	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	3.9673	1.2087	19.5251	1027.1803	1.2812	
BASE ESTIMATE \$'s	\$1,225,091		\$48,813	\$410,872	\$13,709	\$1,698,485
RISK BUDGET FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	3.9673	1.2087	19.5251	1027.1803	1.2812	
FPS TARGET ESTIMATE (FY01 \$)	\$1,225,091		\$48,813	\$410,872	\$13,709	\$1,698,485

NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY01 for input to microframe. SEE De-Escalated Summary....N/A
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G65.

DOES RISK BUDGET APPLY TO F FERNALD SUPPORT COSTS		YES	NO X	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	PPE \$	TOTAL \$
F FERNALD SUPPORT COSTS									
F FERNALD WASTE PROGRAM MGMT.									
RISK BUDGET FACTOR				1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM									
CONSTRUCTION MANAGEMENT - FF									
RISK BUDGET FACTOR				1.00	1.00	1.00	1.00	1.00	1.00
TOTAL CM									
PROJECT MANAGEMENT - FF									
RISK BUDGET FACTOR				1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM									
PROJECT CLOSEOUT - FF									
RISK BUDGET FACTOR				1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO									
ENGINEERING/PLANNING/PROCUREMENT - FF									
RISK BUDGET FACTOR				1.00	1.00	1.00	1.00	1.00	1.00
TOTAL F FERNALD ENG.									
RISK BUDGET FACTOR				1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E									
SUB-TOTAL PROJECT TARGET EST.									

OTHER F FERNALD SALES TAX - 6%									
RISK BUDGET FACTOR				1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER F FERNALD SALES TAX									

TOTAL PROJECT TARGET EST. (FY01 DOLLARS) \$1,698,480

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS			COST / UNIT			LABOR	S/C	MATT	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Matt'l					
	PREMOBILIZATION Part A. See Bond calculation on Summary Sheet Part B.				2,560				\$61,700		\$2,300		\$64,000	
	TOTAL				2,560				\$12,700		\$700	\$400	\$13,800	
	MOBILIZATION				560				\$19,200		\$200		\$19,400	
	DEMOLIBILIZATION				850									
	CONCRETE / STRUCTURAL DEMOLITION				5,074				\$113,800				\$113,800	
	EQUIPMENT DEMOLITION				4,301				\$101,400				\$101,400	
	Subtotal Direct Cost		LOT 1		15,905				\$308,800		\$3,200	\$400	\$312,400	

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MATL	EQUIP	TOTAL
			Unit	Total		Lab	S/C	Mat'l					
PREMOBILIZATION													
A. Bonds and Insurance													
Performance Bond@ 1.5%													
Insurance Bond@ 1.5%													
Insurance Bond@ 3.0%	1	LS											
B. Insurance Certificates, List of Sub-Tier Contractors Procurement Documents, Safe Work Plans, QA/QC Plan, Project Execution Plan, Construction and Engineering Documentation, Acceptable baseline Schedules													
Duration 8 wks	1	LS	320	2,560	24.12								\$64,000
MOBILIZATION													
Set up and install S/C Office Trailer	1	LS	150	150	22.69							\$100	\$4,000
Survey and Engineering Controls	1	LS	150	150	22.69							\$100	\$3,500
Install Utilities	1	LS	140	140	22.69			2,000				\$100	\$3,300
Other misc. requirements as required.	1	LS	120	120	22.69					\$200		\$100	\$3,000
Total			560							\$700		\$400	\$13,800
DEMOBILIZATION													
Complete Punch List Items.	1	LS	150	150	22.69								\$3,400
Remove Trailer and Change Facilities.	1	LS	120	120	22.69								\$2,700
Remove all Utilities.	1	LS	120	120	22.69								\$2,700
Decontaminate Equipment.	1	LS	300	300	22.69							\$600	\$7,400
Loadout contractors equipment.	1	LS	80	80	22.69					\$200		\$200	\$2,200
Other area requirements.	1	LS	80	80	22.69					\$800		\$200	\$1,800
Total			850							\$200		\$800	\$20,200

Calculation is performed on the Summary Sheet

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	CONCRETE / STRUCTURAL DEMOLITION	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l					
	<u>CONTROL ROOM</u>													
mC	Slab on grade	23	CY			22.43			\$5,000				\$5,000	
mC	Walls	120	Cy	1.00	223	22.43								
	<u>PPE CHANGE ROOM</u>													
mC	Walls	109	CY	1.00	203	22.43			\$4,550				\$4,550	
mC	Slab on grade	23	CY			22.43								
	<u>ELECTRICAL EQUIPMENT ROOM</u>													
mC	Walls	120	CY	1.00	223	22.43			\$5,000				\$5,000	
mC	Slab on grade	23	CY			22.43								
	<u>FURNANCE ROOM</u>													
mC	Slab on grade	54	CY	1.00	232	22.43			\$5,200				\$5,200	
mC	Walls	125	Cy			22.43								
	<u>THICKNER TANK AREA</u>													
mC	Slab on grade	140	CY	1.00	335	22.43			\$7,510				\$7,510	
mC	Walls	180	CY	1.00	63	22.43			\$1,410				\$1,410	
mC	Elevated Slab	34	CY			22.43								
	<u>RECYCLE WATER AREA</u>													
mC	Slab on grade	54	CY			22.43								
	<u>CARBON BED AREA</u>													
mC	Slab on grade	43	CY			22.43								
mC	Walls	92	CY	1.00	171	22.43			\$3,840				\$3,840	
mC	Elevated Slab	60	CY	1.00	112	22.43			\$2,510				\$2,510	
	<u>HEPA FILTER AREA</u>													
mC	Slab on grade	102	CY	1.00	100	22.43			\$2,240				\$2,240	
mC	Elevated Slab	54	CY			22.43								
	<u>COOLING TOWER AREA</u>													
mC	Slab on grade	17	CY			22.43								
mC	Elevated Slab	12	CY	1.00	22	22.43			\$490				\$490	
	TOTAL SF of VITT PP = 11000 sf													
	Misc. Allowance	100	Mh	1.00	186	22.43			\$4,170				\$4,170	
	<u>STRUCTURAL STEEL FACTORED</u>													
mC	Structural stl. Prep.	3300	SF	0.02	123	22.43			\$2,760				\$2,760	
mC	Structural debris	932	MH	1.00	1733	22.43			\$38,870				\$38,870	
mC	Piping 4" and <	1500	LF	0.07	195	22.43			\$4,370				\$4,370	
mC	Structural grading	2000	SF	0.10	372	22.43			\$8,340				\$8,340	
mC	Transite siding & roof	5400	SF	0.04	402	22.43			\$9,020				\$9,020	
mC	Pipe rack debris	8000	Lbs	0.01	119	22.43			\$2,670				\$2,670	
mC	STRUCTURAL STEEL	35000	Lbs	0.00	260	22.43			\$5,830				\$5,830	
Subtotal Direct Cost										113,800			\$113,800	
				5,074	\$22.43									

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Vittrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 15-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	EQUIPMENT DEMOLITION	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL							
				Unit	Total	Rate	Lebor	S/C						Mat'l	Equip					
MD	THICKNER TANK																			
MD	CARBON BEDS																			
MD	RECYCLE WATER TANK #1																			
MD	RECYCLE WATER TANK #2																			
MD	AIR COMPRESSOR																			
MD	COPOLING TOWER																			
MD	HEPA FILTERS																			
MD	HEPA UNITS																			
MD	SCRUBBER TOWER																			
MD	QUENCH TOWER																			
MD	SUMP TANKS																			
MD	DESICCANT TOWER																			
MD	EXHAUST STACK																			
MD	SUMP PUMPS																			
MD	QUENCH TOWER PUMPS																			
MD	DESICCANT TOWER PUMPS																			
MD	HEAT EXCHANGER																			
MD	DUCTWORK																			
MD	RECYCLE WATER PUMPS																			
MD	2-TON MONORAIL																			
MD	MELTER FURNACE																			
MD	ELECTRICAL EQUIPMENT																			
MD	CONTROLROOM EQUIPMENT																			
MD	CONVEYOR SYSTEM																			
MD	SLURRY TANKS																			
MD	Equipment D & D was factored from the estimate established on the full scale VITT Plant @ 5 to 1 ratio	1	LS	3000	4301	23.57		\$101,370				\$101,370								
Subtotal Direct Cost												1	LOT	4,301	\$23.58	101,400				\$101,400

APPENDIX "A"

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

SITE SPECIFIC
 EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 16-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

	PERCENT OF INFLUENCE ON CHART MANHOURS								% OF INFLUENCE	WT'D VALUE	PROD. RESULT
	40%	50%	60%	70%	80%	90%	100%	105%			
CRAFT SKILL (NOTE 1)	POOR	POOR		FAIR			STD	V.GOOD	XCELLENT	100.0%	0.12
CRAFT AVAIL.(NOTE 1)	SEVERE	POOR		FAIR			STD			100.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			80.0%	0.16
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	0.05
WORK SPACE		<---- MULTIPLE SHIFTS-		200 SF	250 SF	300 SF	350 SF			100.0%	0.1
WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS	4-10s f/5-8s			100.0%	0.15
50 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0
60 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS				0.0%	0
SHIFTWORK 2ND SHIFT 3RD SHIFT			3RD SHIFT		2ND SHIFT		OR ONE SHIFT ONLY			100.0%	0.03
										100.0%	0.05
PROJECT SIZE					400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS		100.0%	0.04
PLANT TYPE				REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT	GRASS ROOTS			90.0%	0.072
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	0.04
NOTES..... 1. TURNOVER HAS BEEN CONSIDERED 2. FOR EXTERIOR WORK ONLY										100.0%	89.2%

EFFICIENCY (AS A % OFF CHART MANHOURS)

MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S)

1.12

EFFICIENCY FACTORS

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO. C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 16-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
* SITE SPECIFIC (SEE APPENDIX A)	12%	12.0
S/T = BASE UNIT MANHOURS		112
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		112
* TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		112
* PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod.'D'		Mod. "C"		C		C+	
PRODUCTIVITY HOURS (AS A %) / ADD MH's	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER
(AS A MULTIPLIER) / TOTAL HRS	4.00%	4	28.00%	31	66.00%	74	74.00%	83	96.00%	108
TOTAL MULTIPLIER w/SITE PROD.	1.1648	116.5	1.4336	143.4	1.8592	185.9	1.9488	194.9	2.1952	219.5
<p>NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.</p> <p>(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)</p> <p>Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's. (SEE APPENDIX C - HEALTH PHYSICS)</p>										
	12.0	Man Days	14.0	Man Days	19.0	Man Days	19.0	Man Days	22.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY
 THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL,
 TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL
 EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN
 HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO. C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE MULTIPLIER DEVELOPEMENT

	D	mD	mC	C	C+
CREW SIZE & MAKE-UP					
STANDARD	7	7	7	7	7
WORKER-BUDDY	0	0	0	0	0
SUPPORT TEAM	0	0	0	0	0
TOTAL CREW	7	7	7	7	7
CREW SIZE RATIO	1.00	1.00	1.00	1.00	1.00
AVAILABLE WORK TIME FACTOR	0.96	0.78	0.7	0.7	0.68
PPE LABOR PRODUCTIVITY FACTOR	1	1	0.86	0.82	0.75
NET PRODUCTIVITY RATIO	0.96	0.78	0.602	0.574	0.51
NET PRODUCTIVITY MULTIPLIER	1.04	1.28	1.66	1.74	1.96

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mD	mC	C	C+
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDITNL.SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	0	3	3	3
	MINUTES	0	0	15	15	20
TOTAL			0	45	45	60
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	2
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	30
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	20	20
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	N/A	N/A
	MINUTES	N/A	N/A	N/A	N/A	N/A
TOTAL						
AVAILABLE WORK TIME		575	465	420	420	405
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

HEALTH PHYSICS

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 16-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY				
			* NO. OF CHANGE OUTS PER WORKER PER DAY				
				* NO. OF CHANGE OUTS PER WORKER PER DAY			
				* NO. OF CHANGE OUTS PER WORKER PER DAY			
				* NO. OF CHANGE OUTS PER WORKER PER DAY			
/ B : F/HF MASK w/RESP.&CART.		\$'s	*	MAN DAYS	MAT'L.\$'s	PPE LEVEL	(DOUBLE PPE)
TYVEK COVER-ALL w/HOOD & BOOTIES - DIS	EA	4.46	3	30	\$401	C / C+	
TYVEK COVER-ALL w/HOOD & BOOTIES - DIS	EA	4.46	3	30	\$401	C / C+	
GLOVE LINER - DISPOSABLE	PR	0.24	3	30	\$22	C / C+	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	30	\$23	C / C+	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	30	\$92	C / C+	
APR CARTRIDGES - DISPOSABLE	PR	6.98	3	30	\$628	C / C+	
SUB-TOTAL		17.42	3		\$1,567		

\$/MD = \$52.23

PPE LEVEL mC

DESCRIPTION	UNIT	UNIT COST	MAN DAYS	MAT'L.\$'s	PPE LEVEL	
RESS w/ FACE SHIELD		\$'s				
LT.WT. DISPOSABLE COVERALLS W/HOOD &	PR	4.46	3	507	\$6,789	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	507	\$365	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	507	\$396	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	507	\$1,553	mC
SUB-TOTAL		5.98	3		\$9,103	

\$/MD = \$17.94

SUBCONTRACTOR REQUIRED PURCHASES	UNIT	UNIT COST	QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	\$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	\$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	\$0	C
SCBA	EA	1894.00	2	0	\$0	B
COOL VESTS	EA	137.50	6	0	\$0	C/B
THERMO STRIPS	EA	50.00	6	0	\$0	C/B
SUB-TOTAL					\$0	

MAT'L.\$'s
\$10,700

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

HEALTH PHYSICS

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 16-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

-MEDICAL MONITORING -

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	16	64	\$23.14	\$1,480
ANNUAL PHYSICALS	0	4	16	0	\$23.14	\$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	16	16	\$23.14	\$370
SUB-TOTAL						\$1,850

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	6	1	16	96	\$23.14	\$2,220
SUB-TOTAL						\$2,220

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR \$'s	
	15	2	30	\$23.14	\$700	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.0042735	16	0.0684	226

		LABOR \$'s THRU SAFETY	LABOR \$'s
WORK DELAYS CAUSED BY MONITORING	2.0%	\$600,763	\$12,000
			LABOR \$'s
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	\$600,763	\$12,000
		TOTAL LABOR	TOTAL MAT'L.
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET		\$28,800	\$10,700
			GRAND TOTAL
			\$39,500

ACTIVITY DURATIONS **FLUOR FERNALD**

PROJECT: Vitrification Pilot Plant Demolition
 ESTIMATE NO.: C4-01-05-010
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: James J. Ellis
 LOCATION: Fernald
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	04-Feb-00	01-May-04	30-Oct-04	30-Apr-05	12.0	MONTHS
					0	MONTHS
TOTAL					12.0	MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
a.	56.9 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS					0	MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

Memorandum

To:	Jeff Stone, MS52-4	Date:	May 17, 2001
Location:	Fernald	Reference:	N/A
From:	Ken Kepler, MS80-3 	Fernald #:	M:OOTP(PC/EST):2001-0072
Location:	Springdale	Client:	DOE DE-AC24-01OH20115
Extension:	648-6767	Subject:	SILOS 1&2 CHEMICAL STABILIZATION (BASELINE DEMOLITION)

c: File Record Subject ESTIMATE C4-2001-05-003
Dennis Nixon, MS52-4

Attached are two (2) copies for the SILOS 1&2 CHEMICAL STABILIZATION
(BASELINE DEMOLITION).

To request any additional copies of this estimate or for any questions, please contact
Roger Johnson on extension 4140.

KGK:RLJ:hmp
Attachment

ESTIMATE REVIEW FORM

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
ESTIMATE NO.: C4.01.05.003
CLIENT: DOE
WBS NO.: 1.1.H.D

DATE: 16-May-01
ESTIMATOR: Johnson
LOCATION: FERNALD
TASK NO.: HS1AR

COMPLETE ESTIMATE PACKAGE YES _____ NO _____

REQUIRED DOCUMENTS Same documents as for the baseline construction estimate

COMMENTS: The basis for D & D for silo1 &2 was the construction estimate.

REVIEWERS SIGNATURE _____ DATE _____

RESOLUTION: _____

ESTIMATOR: _____ DATE _____

REVIEWER: _____ DATE _____

ESTIMATE REVIEW FORM

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)

DATE: 16-May-01

ESTIMATE NO.: C4.01.05.003

ESTIMATOR: Johnson

CLIENT: DOE

LOCATION: FERNALD

WBS NO.: 1.1.H.D

TASK NO.: HS1AR

OTHER REVIEWS:

REQUESTER _____

DATE _____

CAM if > \$100,000 _____

DATE _____

PROJ.MGR. if > \$ 1M _____

DATE _____

ESTIMATING SERVICES

TEAM COACH



DATE 5/16/01

05/16/2001

CONTRACTOR

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input checked="" type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input checked="" type="checkbox"/>	Equipment List	<input checked="" type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input checked="" type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input checked="" type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4.01.05.002 is to provide a cost for the demolition of the facilities, and systems for silos 1 and 2. The construction estimate was the basis for this estimate. The quantities are those that were factored in the original construction estimate. Only the equipment list was a given number. No salvage value for material and equipment was considered. All costs are in 2001 dollars. Decontamination of material and equipment was assumed to be done by others and was not considered here. The process equipment bulk materials (instruments, electrical, piping and insulation) were factored down from their installation man-hours by 5% to 15% depending on the account, using the estimator's judgement. The building lighting and sprinklers were factored down from their square footage unit into demolition manhours. All units (lot or sf) were factored on the estimator's judgement.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
- Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

WASTE PROGRAM MANAGEMENT:

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Demolition

WBS: 1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.002

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- Waste Program Management dollars provided by the Project Engineer.

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

G & A (HO EXPENSE

This expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

HEALTH PHYSICS:

See attached APPENDIX "C".

RISK BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Demolition
WBS: 1.1.H.D
PROJECT ENGINEER: Jeff Stone
ESTIMATOR: R Johnson
ESTIMATE NUMBER: C4.01.05.002

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The construction estimate was the source for the quantities.
- Unit man-hours were from other D & D estimates used on site.
- All labor costs are in 2001 dollars.
- No salvage value for material or equipment was considered.
- Where unit-man-hours from previous D & D estimates could not be found, a percentage of the installation man-hours was used.

EXCLUSIONS:

- Permits and fees.
- FD G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
- Any costs, to decontaminate material and equipment, prior to demolition.
- All costs for shipping containers, shipping fees and burial costs.

ESTIMATE SUMMARY SHEET

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4-2001-05-003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO. 2	ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
AAA	Mobilization	530		\$14,600				\$14,600
000	- Civil & Excavation All Facilities	4,934		\$106,050				\$106,050
100	- Concrete All Facilities	22,493		\$483,200				\$483,200
200	- Structural Steel - All Facilities	1,538		\$33,000				\$33,000
300	- Architectural/Buildings/Finishes-All Fac	2,524		\$61,200				\$61,200
400	- Equipment Systems	3,002		\$64,520				\$64,520
500	- Piping	3,635		\$78,100				\$78,100
700	- Instrumentation	2,354		\$50,600				\$50,600
600	- Electrical	3,127		\$67,090				\$67,090
800	- Paint / Insulation	321		\$6,900				\$6,900
DIRECT FIELD COSTS TOTAL		44,468	\$21.71	\$965,260				\$965,260
SUPERVISION - CONTRACTOR		33,341		\$723,900				\$723,900
SMALL TOOLS & CONSUMABLES						\$57,900		\$57,900
MISC. EQUIP. RENTAL							\$555,700	\$555,700
TEMPORARY FACILITIES		1,778		\$38,600		\$38,600		\$77,200
TEMPORARY UTILITY HOOK-UP		1,445		\$31,400		\$16,900		\$48,300
JOB CLEAN-UP		2,001		\$43,400		\$14,500		\$57,900
SAFETY (INCLUDED WITH SITE & PPE PROD.FACTORS)								
HEALTH PHYSICS S/C		4,233		\$91,900		\$1,200		\$93,100
CERCLA - 40 HRs/FTE		1,325		\$28,800				\$28,800
GET/SITE ACCESS & JOB SPECIFIC TRAINING		954		\$20,700				\$20,700
PAYROLL BURDENS & BENEFITS		-	-	\$1,108,100				\$1,108,100
OVERHEAD & PROFIT		-	-		\$747,400			\$747,400
BOND		-	-		\$44,800			\$44,800
SALES TAX		-	-			\$7,700	\$33,300	\$41,000
INDIRECT FIELD COSTS TOTAL		46,077		\$2,086,800	\$792,200	\$136,800	\$589,000	\$3,604,800
DIRECT & INDIRECT FIELD COSTS TOTAL - ITEM NO. 2		89,536	\$34.09	\$3,052,060	\$792,200	\$136,800	\$589,000	\$4,570,060
WASTE DISPOSITION MGMT. - F FERNALD								
OFF-SITE DISPOSAL COSTS (Commercial)								
WASTE MANAGEMENT COSTS TOTAL								
PROJECT MANAGEMENT - F FERNALD								
CONSTRUCTION MANAGEMENT - F FERNALD								
F FERNALD FIELD SUPPORT COSTS TOTAL - ITEM NO.3								
ENGINEERING/DESIGN/INSPECTION - F FERNALD								
ENGINEERING/DESIGN/INSPECTION - A/E								
ENGINEERING COSTS TOTAL - ITEM NO.4								
SALES TAX - F FERNALD								
SUB-TOTAL (BASE ESTIMATE)								\$4,570,100
RISK BUDGET								
TARGET ESTIMATE								\$4,570,100
CONTINGENCY								
NTS BURIAL FEE								
ESTIMATE PERFORMED BY ESTIMATING SERVICES								

S:\ESTIMATE\Roger\2001 Silo estimates\Chemical Silo 1&2\DEMO Chemical stab

ESTIMATE SUMMARY SHEET

PROJECT: **Site 1 & 2 Chemical Stabilization (Baseline Demolition)**
 ESTIMATE NO.: **C4.01.05.003**
 CLIENT: **DOE**
 WBS NO.: **1.1.H.D**

DATE: **16-May-81**
 ESTIMATOR: **Johnson**
 LOCATION: **FERNALD**
 TASK NO.: **HS1AR**

***FACTORS**

FIXED PRICE SUBCONTRACT	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$965,260				\$1,200	\$966,460
IFC COST FACTOR	3.9125	-			-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2097	1.2097	1.2097	1.2097	1.2097	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	4.7330	1.2097			1.2823	
BASE ESTIMATE \$'s	\$4,568,558				\$1,539	\$4,570,097
RISK BUDGET FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	4.7330	1.2097			1.2823	
FPS TARGET ESTIMATE (FY01 DOLLARS)	\$4,568,558				\$1,539	\$4,570,097

NOTE:

1.)The above costs represent constant FY dollars and require de-escalation to FY01 for input to microframe. SEE De-Escalated Summary....N/A
 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G62.

DOES RISK BUDGET APPLY TO F FERNALD SUPPORT COSTS ?	YES	NO	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
F FERNALD SUPPORT COSTS								
F FERNALD PROJECT MGMT.								
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL PM								
F FERNALD CONSTRUCTION MGMT.								
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL CM								
F FERNALD WASTE PROGRAM MGMT.								
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL WPM								
F FERNALD RSO								
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL RSO								
F FERNALD ENGINEERING/DESIGN/INSPECTION								
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL FD FERNALD ENG.								
A/E ENGINEERING/DESIGN/INSPECTION								
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL A/E								
SUB-TOTAL PROJECT TARGET EST. (FY01 DOLLARS)								\$4,570,097

OTHER F FERNALD SALES TAX - 6%								
RISK BUDGET FACTOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL OTHER F FERNALD SALES TAX								

TOTAL PROJECT TARGET EST. (FY01 DOLLARS)								\$4,570,097
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ESTIMATE SUMMARY SHEET

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4-2001-05-003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

**'Direct Field Cost
 w / FACTORS**

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

PAY ITEM NO.	DESCRIPTION	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$	
ITEM NO. 2	AAA - Mobilization	14600				1200		
		\$69,100				1200	15800	
						\$1,540	\$70,640	
	000 - Civil & Excavation All Facilities	106050					106050	
		\$501,930					\$501,930	
	100 - Concrete All Facilities	483200						
		\$2,286,980					\$2,286,980	
	200 - Structural Steel - All Facilities	33000						
		\$156,190					\$156,190	
	300 - Architectural/Buildings/Finishes-All Fac	81200						
	\$289,660					\$289,660		
400 - Equipment Systems	64520							
	\$305,370					\$305,370		
500 - Piping	78100							
	\$369,650					\$369,650		
700 - Instrumentation	50600							
	\$239,490					\$239,490		
600 - Electrical	67090							
	\$317,540					\$317,540		
800 - Paint / Insulation	6900							
	\$32,660					\$32,660		
TOTAL DIRECT FIELD COSTS w/FACTORS							\$4,570,110	
		(FY01 DOLLARS)						

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

Fluor Fernald, Inc.

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
<u>Civil & Excavation All Facilities</u>														
<u>D. Excavation of all buildings</u>														
D	1. Excavation	7895	CY	0.11	1188	21.48			\$25,730				\$25,730	
D	2. Backfill and compaction	7895	CY	0.15	1853	21.48			\$35,510				\$35,510	
D	3. Vapor barrier	81240	SF	0.0010	112	21.48			\$2,410				\$2,410	
D	4. Haul and dump		CY	0.08		21.48								
D	5. Install cage fence	90	LF	0.25	31	21.48			\$670				\$670	
D	6. Install cage gate	3	EA	4.00	17	21.48			\$370				\$370	
D	7. Catch basin	4	EA	8.00	33	21.48			\$710				\$710	
D	8. C B frame and cover	4	EA	5.00	28	21.48			\$800				\$800	
D	9. Sand bedding		CY	0.75		21.48								
D	Concrete filled pipe posts	42	EA	0.75	43	21.48			\$920				\$920	
<u>E. SITE WORK</u>														
D	1. Grade,scarify & compact site		SY	0.028		21.48								
D	2. Rough grade & compact for roads		SY	0.038		21.48								
D	3. Spread & compact crushed rock for roads		SY	0.017		21.48								
D	4. Asphalt for roads	2340	SY	0.025	81	21.48			\$1,740				\$1,740	
D	5. Repair shoulder of roads		SY	0.020		21.48								
D	6. Final site grading		SY	0.012		21.48								
D	7. Crushed rock for site		SY	0.017		21.48								
D	Dust Control		hrs	1.00		21.48								
D	Silt Fencing	1500	lf	0.01	10	21.48			\$210				\$210	
D	Haul To OSDF	1156	loads	0.80	1276	21.48			\$27,410				\$27,410	
D	Box for shipment off-site	316	boxes	1.00	436	21.48			\$9,370				\$9,370	
<u>Take-off Allowance</u>														
<u>Subtotal Direct Cost</u>										105,700				\$105,700
				4.918	\$21.40									

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSIAR

ITEM NO.	100 - Concrete All Facilities	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MATT'L	EQUIP	TOTAL
				Unit	Total		Labor	SIC	Mat'l					
CONCRETE														
D	1. Install slab on grade	2441	CY	1.08	3638	21.48				\$78,140				\$78,140
D	2. Install walls	2051	CY	2.00	5682	21.48				\$121,820				\$121,820
D	3. Install structural footings	527	CY	1.25	910	21.48				\$19,550				\$19,550
D	4. Install continuous footings	611	CY	1.08	911	21.48				\$19,570				\$19,570
D	5. Install equipment foundations	245	CY	1.50	508	21.48				\$10,810				\$10,810
D	6. Grouting	315	CF			21.48								
mC	7. Tilt-up walls	34273	SF	0.06	4220	21.48				\$90,850				\$90,850
D	8. Install elevated slab	1147	CY	2.80	4581	21.48				\$98,610				\$98,610
mC	9. Install columns for modular walls	444	CY	2.20	2004	21.48				\$43,050				\$43,050
D	10. Install stack base	2	CY	1.08	3	21.48				\$80				\$80
D	11. Install duct footings	8	CY	1.08	8	21.48				\$180				\$180
D	12. Install guy anchors	8	CY	1.00	11	21.48				\$240				\$240
D	13. Fabricate cover block		EA			21.48								
D	14. Erect cover block		EA			21.48								
D	15. Stack structural footing	4	CY	1.08	6	21.48				\$130				\$130
D	16. Embedded bolts for box beam	144	EA	0.100	20	21.48				\$430				\$430
Take-off Allowance														
Subtotal Direct Cost										463,200				\$463,200
1 LOT										22,483	\$21.48			\$485,200

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	200 - Structural Steel - All Facilities	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Labor	SIC	Mat'l					
2														
	<u>Structural Steel</u>													
D	1. Install metal roofing	28188	SF	0.010	381	21.48			\$7,750					\$7,750
D	2. Install light steel	188	TON	1.20	274	21.48			\$5,880					\$5,880
D	3. Install medium steel	99	TON	1.20	164	21.48			\$3,520					\$3,520
D	4. Install heavy steel	113	TON	1.20	187	21.48			\$4,020					\$4,020
D	5. Install stack structure	4.4	TON	1.2	7	21.48			\$150					\$150
D	6. Install checkered plate	4305	SF	0.02	88	21.48			\$1,810					\$1,810
D	7. Install ladders	382	LF	0.02	8	21.48			\$170					\$170
D	8. Install stairs	318	RISER	0.05	22	21.48			\$470					\$470
D	9. Install handrails	898	LF	0.01	10	21.48			\$210					\$210
D	10. Install pre-engineered structure	9800	SF	0.01	181	21.48			\$4,100					\$4,100
D	11 Crane rails	3.95	TON	1.20	7	21.48			\$150					\$150
D	12. Install crane rail box beam	8	TON	1.20	15	21.48			\$320					\$320
D	13. Install support for box beam	28	EA	0.05	2	21.48			\$40					\$40
D	14. Install crane rail stops	4	PR	0.10	1	21.48			\$20					\$20
D	15. Install 2-1/2" x 2-1/2" x 1/4" angle iron	120	LF	0.01	2	21.48			\$40					\$40
mC	16. Install sumps	14	EA	4.00	115	21.48			\$2,470					\$2,470
D	17. Install grading	2093	SF	0.02	43	21.48			\$920					\$920
D	19. Install davit	4	EA	0.20	1	21.48			\$20					\$20
D	20. Install kickplate	305	LF	0.01	4	21.48			\$80					\$80
D	21. Install duct support	6	EA	1.00	8	21.48			\$170					\$170
D	22. Install duct to stack	150	LF	0.10	21	21.48			\$450					\$450
D	. Guy cable	800	LF	0.01	8	21.48			\$130					\$130
Take-off Allowances														
Subtotal Direct Cost										33,000				\$33,000

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	300 - Architectural/Buildings/Finishes-All Fac	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Lab	SIC					
ARCHITECTURAL													
D	1. Install metal stud w/gyp. board	8887	SF	0.010	120	21.48			\$2,580				\$2,580
D	2. Install vents and drains	45851	SF	0.001	63	21.48			\$1,350				\$1,350
D	3. Install cleaning agent	1	LOT	3.0	4	21.48			\$80				\$80
D	4. Install siding	51389	SF	0.010	709	21.48			\$15,230				\$15,230
D	5. Install roof insulation	28118	SF	0.004	144	21.48			\$3,080				\$3,080
D	6. Install wall insulation	25888	SF	0.002	71	21.48			\$1,530				\$1,530
D	7. Install membrane roofing	28118	SF	0.002	72	21.48			\$1,550				\$1,550
D	8. Install 1/2" fiber board	28118	SF	0.001	38	21.48			\$770				\$770
D	9. Install single exterior door 3x7	18	EA	0.50	13	21.48			\$280				\$280
D	10. Install double ext. door 6x7	3	EA	1.00	4	21.48			\$80				\$80
D	11. Install roll-up door 14' x 14'	7	EA	2.00	19	21.48			\$410				\$410
D	12. Install single int. door 3x7	10	EA	0.50	7	21.48			\$150				\$150
D	13. Install double int. door 6x7	8	EA	1.00	11	21.48			\$240				\$240
D	14. Install roof closure	488	LF	0.00	1	21.48			\$20				\$20
D	15. Install bldg. communications	74559	SF	0.00	257	21.48			\$5,520				\$5,520
D	16. Install coated poly. bldg. cover	34850	SF	0.001	48	21.48			\$1,030				\$1,030
D	17. Install tank shelter		EA	340.0		21.48							
D	18. Block and level trailers		EA	50.0		21.48							
D	19. Install skirting around trailers	324	SF	0.0	8	21.48			\$180				\$180
D	20 Seal ext. walls, roof & floor		LF	0.3		21.48							
D	21 Fab abd install stairs & ramps	1	LOT	5	7	21.48			\$150				\$150
D	22 Ceiling	100	SF	0.001		21.48							
D	Staires to trailers	10	EA	2.000	28	21.48			\$3,800				\$3,800
D	Trailer Skirting	10800	SF	0.00	15	21.48			\$4,080				\$4,080
D	1. install building sprinklers	73118	SF	0.0028	283	21.48			\$6,080				\$6,080
D	1. Install double int. door 10x8	3	EA	1.00	4	21.48			\$80				\$80
C. H.V.A.C.													
D	1. install ductwork galv. stl.	78018.044	LBS	0.0035	377	21.48			\$8,100				\$8,100
D	2. install dampers	1	LOT	41	57	21.48			\$1,220				\$1,220
D	3. install accessories	1	LOT	19	28	21.48			\$560				\$560
D	4. install supports	1	LOT	55	78	21.48			\$1,830				\$1,830
D	5. install insulation	1	LOT	48	63	21.48			\$1,350				\$1,350
D	6. Test and Balance	1	LOT			21.48							
Take-off Allowance													
Subtotal Direct Cost										81,200			\$81,200

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4-01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	400 - Equipment Systems	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
2	Equip. No.13 Description													
mC	13-PM-001 A, B, C, D, E, F Transfer Pump	8	EA	3.0	37	21.48			\$780				\$780	
mC	13-PM-002 A,B,C,D,E,F Jet Pump	6	EA	5.0	62	21.48			\$1,330				\$1,330	
mC	13-TK-001 A,B,C Slurry Receipt Tank	3	EA	115.0	708	21.48			\$15,210				\$15,210	
mC	13-EJ-001,002,003 Slurry Jet Ejector	21	EA	1.0	43	21.48			\$820				\$820	
D	Equip. No.15 Description													
D	15-PM-001 A&B Lime Slurry Addition Pump	2	EA	3.0	8	21.48			\$170				\$170	
D	15-PM-002 A&B Phosphate Addition Pump	2	EA	3.0	8	21.48			\$170				\$170	
D	15-PM-004 A&B Alum Addition Pump	2	EA	3.0	8	21.48			\$170				\$170	
D	15-PM-005 A&B Clarifier Underflow Pump	2	EA	3.0	8	21.48			\$170				\$170	
D	15-PM-005 C&D pH Recirculation Pump	2	EA	3.0	8	21.48			\$170				\$170	
D	15-PM-006 A&B Clarifier Overflow Pump	2	EA	3.0	8	21.48			\$170				\$170	
D	15-MX-001B Lime Slurry Feed Tank Mixer	1	EA	3.0	4	21.48			\$80				\$80	
D	15-MX-002A & B Phosphate Prep Tank Mixer	2	EA	3.0	8	21.48			\$170				\$170	
D	15-MX-005A Flocculator Mixer	1	EA	4.0	8	21.48			\$130				\$130	
D	15-MX-005B Polyelectrolyte Mixer	1	EA	4.0	8	21.48			\$130				\$130	
D	15-MX-008 Clarifier Mixer	1	EA	4.0	8	21.48			\$130				\$130	
D	15-PP-001 Polyelectrolyte Package	1	EA	4.0	8	21.48			\$80				\$80	
D	15-TK-001A Lime Bag Breaker/Feeder	1	EA	2.0	3	21.48			\$80				\$80	
D	15-TK-001B Lime Slurry Feed Tank	1	EA	3.0	4	21.48			\$80				\$80	
D	15-TK-002 A&B Phosphate Preparation Tank	2	EA	4.0	11	21.48			\$240				\$240	
D	15-TK-005A Flocculator	1	EA	3.0	9	21.48			\$180				\$180	
D	15-TK-005B Polyelectrolyte Addition Tank	1	EA	3.0	4	21.48			\$80				\$80	
D	15-TK-006 Clarifier	1	EA	115.0	159	21.48			\$3,420				\$3,420	
D	15-TK-007 Clarifier Overflow Tank	1	EA	3.0	4	21.48			\$80				\$80	
D	Equip. No.16 Description													
D	16-PM-001A,B,C,D,E,F Slurry Feed Pump	6	EA	3.0	25	21.48			\$540				\$540	
D	16-TK-001 A,B,C Slurry Feed Tank	3	EA	8.0	25	21.48			\$540				\$540	
D	16-MX-001 A,B,C Slurry Feed Tank Mixer	3	EA	8.0	33	21.48			\$710				\$710	
D	Equip. No.17 Description													
D	17-PM-001 Waste Water Pump	1	EA	3.0	4	21.48			\$80				\$80	
D	17-PM-002 Mixer Room Sump Pump	1	EA	3.0	4	21.48			\$80				\$80	
D	17-CN-001 Waste Water Container	1	EA	4.0	8	21.48			\$130				\$130	
D	17-CV-001 A,B,C Product Conveyor	3	EA	25.0	104	21.48			\$2,230				\$2,230	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	400 - Equipment Systems	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC					
D	17-MX-001 A,B,C Product Mixer Equip. No.19 Description	3	EA	40.0	188	21.48			\$3,570				\$3,570
D	19-PM-001 Mixer Dust Collector	1	EA	4.0	6	21.48			\$130				\$130
D	19-BL-001 Dust Collector Blower Equip. No.25 Description	1	EA	2.0	3	21.48			\$80				\$80
D	25-CY-001 Empty Container/Lid Removal Co	1	EA	8.0	11	21.48			\$240				\$240
D	25-CY-002 A,B,C Fill Conveyor	3	EA	5.0	21	21.48			\$450				\$450
D	25-CY-003 A,B,C Sample Conveyor	3	EA	5.0	21	21.48			\$450				\$450
D	25-CY-004 A,B,C Head Install/Fastening Con	3	EA	4.0	17	21.48			\$370				\$370
D	25-CY-005 Survey/Decon Station Conveyor	1	EA	5.0	7	21.48			\$150				\$150
D	25-CY-006 Filled Container A/L Conveyor + B	1	EA	4.0	6	21.48			\$130				\$130
D	25-CY-007 Filled Container Staging Conv.	1	EA	8.0	8	21.48			\$170				\$170
D	25-HD-001 Fork Lift Equip. No.40 Description	1	EA			21.48							
D	40-ME-001 A&B Plant Air Compressor	2	EA	8.0	22	21.48			\$470				\$470
D	40-ME-002 A Instrument Air Compressor	1	EA	4.0	6	21.48			\$130				\$130
D	40-ME-001 Plant Air Compressor Dryer	1	EA	2.0	3	21.48			\$80				\$80
D	40-rr-002 Instrument Air Compressor Drye	1	EA	2.0	3	21.48			\$80				\$80
D	40-ME-003 Plant Air Receiver	1	EA	2.0	3	21.48			\$80				\$80
D	40-ME-006 Instrument Air Receiver Equip. No.41 Description	1	EA	2.0	3	21.48			\$80				\$80
D	41-ME-001 A&B Breathing Air Compressor	2	EA	8.0	17	21.48			\$370				\$370
D	41-ME-002 Breathing Air Dryer	1	EA	4.0	6	21.48			\$130				\$130
D	41-ME-003 Breathing Air Purifier	1	EA	1.0	1	21.48			\$20				\$20
D	41-ME-004 A&B Breathing Air Receiver Equip. No.44 Description	2	EA	2.0	6	21.48			\$130				\$130
D	44-BN-001 Cement storage bin	1	EA	50.0	88	21.48			\$1,480				\$1,480
D	44-BN-002 A&B Fly Ash Bin	2	EA	50.0	138	21.48			\$2,880				\$2,880
D	44-CV-001 Cement Conveyor	1	EA	10.0	14	21.48			\$300				\$300
D	44-CV-002 Fly Ash Conveyor Equip. No.55 Description	1	EA	10.0	14	21.48			\$300				\$300
D	55-PM-001 A&B Sluicing Pump	2	EA	4.0	11	21.48			\$240				\$240
D	55-TK-001 Clarifier Tank	1	EA	115.0	159	21.48			\$3,420				\$3,420

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: CA.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

ITEM NO.	400 - Equipment Systems	QTY	UNIT	MAN-HOURS		COST/UNIT		LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Lab					
2	Equip. No.82											
D	62-PM-001 Liquid Waste Pump	1	EA	3.0	4	21.48		\$80				\$80
D	62-TK-001 Liquid Waste Tank	1	EA	115.0	158	21.48		\$3,420				\$3,420
	Equip. No.73											
D	73-AH-001 Zones 1&2 Air Handling Unit	1	EA	20.0	28	21.48		\$600				\$600
D	73-AH-002 Con Storage Bldg AHU	1	EA	8.0	11	21.48		\$240				\$240
D	73-AH-003A & b Zones 2&3 Air Handling Unit	2	EA	20.0	55	21.48		\$1,180				\$1,180
D	73-AH-004 Monitoring Room Air Handling Unit	1	EA	2.0	3	21.48		\$80				\$80
D	73-AH-005 Cold Chem Make up Room	1	EA	2.0	3	21.48		\$80				\$80
D	73-FA-001 A&B Zone 1 Filter Exhaust Fan	2	EA	4.0	11	21.48		\$240				\$240
D	73-FA-002 Con Sto Bldg Exh Fan	1	EA	5.0	7	21.48		\$150				\$150
D	73-FA-003 A&B Zones 2&3 Exhaust Fan	2	EA	5.0	14	21.48		\$300				\$300
D	73-FL-001 A&B Clean Area Filter Housing	2	EA	12.0	33	21.48		\$710				\$710
D	73-FL-003 A,B,C Contaminated Area Filter Housing	3	EA	12.0	50	21.48		\$1,070				\$1,070
D	73-HE-002 Liquid Pretreat. Corridor	1	EA	4.0	8	21.48		\$130				\$130
D	73-HE-003 Access Control Room Heater	1	EA	2.0	3	21.48		\$80				\$80
D	73-HE-004 Con Sto Bldg Heater	1	EA	3.0	4	21.48		\$80				\$80
D	73-HE-005 Survey & Decon Test Rm Heater	1	EA	2.0	3	21.48		\$80				\$80
D	73-HE-006 Monitor room Heater	1	EA	2.0	3	21.48		\$80				\$80
D	73-HE-007 Product Mixing Rm Corr Heater	1	EA	3.0	4	21.48		\$80				\$80
D	73-HE-008 Cold Chem Make up Rm Heater	1	EA	2.0	3	21.48		\$80				\$80
D	73-ST-001 HVAC Stack	1	EA	18.0	25	21.48		\$540				\$540
	Equip. No.82											
D	82-CN-001 Monorail Hoist 1 Ton	1	EA	2.0	3	21.48		\$80				\$80
D	82-CN-002 A,B,C Monorail Hoist,2 Ton	3	EA	2.0	8	21.48		\$170				\$170
D	82-CN-003 A,B,C Monorail Hoist,1 Ton	3	EA	2.0	8	21.48		\$170				\$170
D	82-CN-004 Bridge Crane,20 Ton	1	EA	50.0	88	21.48		\$1,480				\$1,480
D	82-ME-001 Head Grapple,Interim con Staging	1	EA	1.0	1	21.48		\$20				\$20
D	82-ME-003 A,B,C Container Fill Head	3	EA	3.0	12	21.48		\$280				\$280
D	82-ME-004 A,B,C Transfer Drawer for Cont	3	EA	3.0	12	21.48		\$280				\$280
D	82-ME-005 A,B,C Additive Head for Adsorb	3	EA	3.0	12	21.48		\$280				\$280
D	82-ME-006 A,B,C Head Grapple @ Cont.Head	3	EA	3.0	12	21.48		\$280				\$280
D	82-ME-007 A,B,C Head Festerer @ Cont	3	EA	4.0	17	21.48		\$370				\$370
D	82-ME-008 A,B,C Container Smear equip	3	EA	4.0	17	21.48		\$370				\$370
D	82-ME-009 A&B Bar Code Installer	3	EA	4.0	17	21.48		\$370				\$370

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	500 - Piping	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labo	SIC					
D	1. Install 1/2" c.s. gate valve	155	EA			21.48							
D	2. Install 3/4" c.s. gate valve	28	EA			21.48							
D	3. Install 2" c.s. gate valve	28	EA			21.48							
D	4. Install 1/2" s.s. gate valve	44	EA			21.48							
D	5. Install 3/4" s.s. gate valve	10	EA			21.48							
D	6. Install 2" s.s. gate valve	10	EA			21.48							
D	7. Install 1-1/2" s.s. check valve	8	EA			21.48							
D	8. Install 3" s.s. check valve	4	EA			21.48							
D	Relocate existing 30" drain line	150	LF	0.3	55	21.48		\$1,180				\$1,180	
D	2 Install new (HDPE) drain line	300	LF	0.200	83	21.48		\$1,780				\$1,780	
D	11. Install bin loading lines	325	LF	0.14	83	21.48		\$1,350				\$1,350	
mC	2. Install double cont. pipe	2100	LF	0.2	862	21.48		\$18,520				\$18,520	
D	3. Install piping including valves bulk	1	LOT	1283	1770	21.48		\$38,020				\$38,020	
	Firewater												
D	1. Install 4" post indicator valves	1	EA	2.00	3	21.48		\$80				\$80	
D	2. Install 12" std. wt cs pipe	1240	LF	0.18	274	21.48		\$5,880				\$5,880	
D	3. Install 8" std. wt cs pipe	850	LF	0.18	144	21.48		\$3,080				\$3,080	
D	4. Install 4" std. wt cs pipe	1100	LF	0.14	213	21.48		\$4,580				\$4,580	
D	5. Install hydrants	21	EA	2.00	58	21.48		\$1,250				\$1,250	
D	6. Install 4" gate valves	21	EA	2.00	58	21.48		\$1,250				\$1,250	
D	7. Install valve boxes	21	EA	1.00	29	21.48		\$820				\$820	
D	8. Install 4" post indicator valves	3	EA	4.00	17	21.48		\$370				\$370	
D	9. Install 8" post indicator valves	1	EA	4.00	8	21.48		\$130				\$130	
Take-off Allowance													
Subtotal Direct Cost												\$76,100	
TOTAL												\$76,100	

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: CA.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	700 - Instrumentation	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC					
mC													
D	SYSTEM.13	1	LOT	581	1150	21.48							\$24,700
D	SYSTEM.15	1	LOT	108	150	21.48							\$3,220
D	SYSTEM.16	1	LOT	184	254	21.48							\$5,480
D	SYSTEM.17	1	LOT	8	10	21.48							\$210
D	SYSTEM.19	1	LOT	13	18	21.48							\$380
D	SYSTEM.40	1	LOT	68	85	21.48							\$2,040
D	SYSTEM.55	1	LOT	142	188	21.48							\$4,210
D	SYSTEM.62	1	LOT	138	188	21.48							\$4,040
D	Install HVAC controls	24	EA	1.0	33	21.48			\$710				\$710
D	DCS												
D	1. Install distrib. control sys.	1	LOT	30.0	41	21.48			\$880				\$880
D	2. Install control software												
D	Fire Detection												
D	1. Install fire alarm & evacuation sys.	1	LOT	8	10	21.48			\$210				\$210
D	Health Physics												
D	1. Install real time SOx monitor	1	EA	2	3	21.48			\$80				\$80
D	2. Install hps control station	1	EA	3	8	21.48			\$170				\$170
D	3. Install auto radio counter	2	EA	2	22	21.48			\$470				\$470
D	4. Install radonn wkg. level monitor	8	EA	4	17	21.48			\$370				\$370
D	5. Install body frisker	3	EA	1	17	21.48			\$370				\$370
D	6. Install air sampling station (CAM)	12	EA	4	11	21.48			\$240				\$240
D	7. Install tool contamination monitor	2	EA	8	22	21.48			\$470				\$470
D	8. Install isokinetic air sampler	2	EA	2	57	21.48			\$1,220				\$1,220
mC	1. Install leak detection	14	EA	8	18	21.48			\$340				\$340
mC	2. Install isokinetic monitor	1	EA	18	24	21.48			\$520				\$520
D	3. Install instruments and bulk mat'l	1	LOT	18	24	21.48			\$280				\$280
D	Install pressure rad monitor	9	EA	1.0	12	21.48							
	Freight @ 2.5%												
	Take-off Allowance												
	Subtotal Direct Cost	1	LOT		2,354	\$21.50			\$50,600				\$50,600

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

Fluor Fernald, Inc.

ITEM NO.	800 - Paint / Insulation	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l					
D	1. Paint steel		SF	0.02										
D	2. Paint gyp board		SF	0.01										
D	3. Paint single doors		EA	2.7										
D	4. Paint double door		EA	5.4										
D	5. Coat masonry		SF	0.02										
D	7. Paint bulk		LOT	1528										
D	1. Insulation bulk	1	LOT	232	321	21.48			\$6,800				\$6,800	
D	Paint equipment		SF	0.015										
Take-off Allowance														
Subtotal Direct Cost										6,900				\$6,900

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Lebor	SIC	Mat'l					
D	3. LTG, CONT'L RM	1944	SF	0.02	54	21.48			\$1,180				\$1,180	
D	4. LTG-Waste process, M/E, whee, etc	52427	SF	0.01	579	21.48			\$12,440				\$12,440	
D	5. Install lighting to On-Site Storage bldg.	24750	SF	0.01	238	21.48			\$5,130				\$5,130	
D	7. Install elect bulk non-process. Instrumen Equipment NO. 13	1	LOT	4	5	21.48			\$110				\$110	
mC	Motor flex conduit conn. to 10 HP	8	EA	0.20	2	21.48			\$40				\$40	
mC	Motor flex conduit conn. to 20 HP	8	EA	0.20	2	21.48			\$40				\$40	
mC	3/4" Sealrite flex cond.	5	EA	0.20	2	21.48			\$40				\$40	
mC	Push botton station	13	EA	0.40	11	21.48			\$240				\$240	
mC	3/4" Galv rigid cond.	4800	LF	0.01	58	21.48			\$1,270				\$1,270	
mC	1" Galv rigid cond.	2400	LF	0.01	30	21.48			\$640				\$640	
mC	3/4" "L" ftg w cover and gasket	88	EA			21.48								
mC	1" "L" ftg w cover and gasket	48	EA			21.48								
mC	3/4" Conduit union "UNY"	40	EA			21.48								
mC	1" Conduit union "UNY"	20	EA			21.48								
mC	3/4" Conduit seal "EYS"	14	EA			21.48								
mC	1" Conduit seal "EYS"	7	EA			21.48								
mC	3/4" Conduit hub	14	EA			21.48								
mC	1" Conduit hub	7	EA			21.48								
mC	Control wire 3#14	5480	LF			21.48								
mC	Power wire 3#12 w/#12 grd	5040	LF			21.48								
mC	Power wire 3#8 w/#10 grd	2520	LF			21.48								
mC	Wire term 1/c #14	78	EA			21.48								
mC	Wire term 1/c #12	72	EA			21.48								
mC	Wire term 1/c #10	12	EA			21.48								
mC	Wire term 1/c #8	18	EA			21.48								
mC	Motor conn. kit #14-#10	7	EA			21.48								
mC	Motor conn. kit #8-#4	8	EA			21.48								
mC	13. Miscellaneous and support material Eaad.Praparation.15		LOT			21.48								
D	1. Install 480V pr. & mtr. feeders up to 10h	8	EA			21.48								
D	2. Install 480V pr. & mtr. feeders 20,25,40	10	EA			21.48								
D	3. Install 1-1/2" seal. flex conduit	1	LOT	0.2		21.48								
D	4. Install start-stop station fac. sealed	18	EA	0.2	5	21.48			\$110				\$110	
D	5. Install 100a-600v LDS expl. proof	1	EA	0.2		21.48								
D	6. Install 3/4" cond. galv. stl.	4000	FT	0.01	33	21.48			\$710				\$710	
D	7. Install 1" cond. galv. stl.	5000	FT	0.01	41	21.48			\$880				\$880	
Subtotal Direct Cost														
1														

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: CA.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	ITEM	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l					
D	7. Install 1-1/2" cond. galv. stl.	500	FT	0.01	4	21.48			\$80				\$80	
D	8. Install 3/4"-L-flg. with cover & gasket	80	EA			21.48								
D	9. Install 1"-L-flg. with cover & gasket	100	EA			21.48								
D	9. Install 1-1/2"-L-flg. with cover & gasket	10	EA			21.48								
D	10. Install 3/4" cond. union UNY	32	EA			21.48								
D	11. Install 1" cond. union UNY	40	EA			21.48								
D	11. Install 1-1/2" cond. union UNY	6	EA			21.48								
D	12. Install 3/4" cond. seal "EYS"	8	EA			21.48								
D	13. Install 1" cond. seal "EYS"	11	EA			21.48								
D	13. Install 1-1/2" cond. seal "EYS"	1	EA			21.48								
D	14. Install 3/4" cond. hub	8	EA			21.48								
D	15. Install 1" cond. hub	11	EA			21.48								
D	15. Install 1-1/2" cond. hub	2	EA			21.48								
D	16. Install 3-#14cntrl. wire, str. cu 600v	9400	FT			21.48								
D	17. Install 3 #12w/ #12 grd. power wire	4120	FT			21.48								
D	18. Install 3 #8w/ #10 grd. power wire	4850	FT			21.48								
D	18. Install 3 #6w/ #8 grd. power wire	520	FT			21.48								
D	19. Install 3 #2w/ #8 grd. power wire	520	FT			21.48								
D	20. Install 1/c #14 wire term, 600v	108	EA			21.48								
D	21. Install 1/c #12 wire term, 600v	40	EA			21.48								
D	21. Install 1/c #10 wire term, 600v	8	EA			21.48								
D	22. Install 1/c #8 wire term, 600v	28	EA			21.48								
D	22. Install 1/c #6 wire term, 600v	3	EA			21.48								
D	23. Install 1/c #2 wire term, 600v	8	EA			21.48								
D	23. Install starter & fused disc. switch		EA	2.0		21.48								
D	24. Install 2- #4/Omtr. cont. kit, 600v		EA			21.48								
D	25. Install 14- #10 mtr. cont. kit, 600v	8	EA			21.48								
D	26. Install 8 - #4 mtr. cont. kit, 600v	10	EA			21.48								
D	27. Install flex cond. conn. assy	157	EA		0.2	21.48			\$820				\$820	
D	28. Install st. stl. box 20"x20"x6" w/term.	8	EA		1.0	21.48			\$240				\$240	
D	29. Install 3/4" galv. ridg. stl. conduit	3150	FT		0.01	21.48			\$560				\$560	
D	30. Install 1" galv. ridg. stl. conduit	740	FT		0.01	21.48			\$130				\$130	
D	31. Install 1-1/2" galv. ridg. stl. conduit	870	FT		0.01	21.48			\$130				\$130	
D	32. Install 2" galv. ridg. stl. conduit	340	FT		0.01	21.48			\$80				\$80	
D	33. Install 3/4" "L" ftg. w/cover & gasket	138	EA			21.48								
D	34. Install 1" "L" ftg. w/cover & gasket	28	EA			21.48								
D	35. Install 1-1/2" "L" ftg. w/cover & gasket	28	EA			21.48								

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	800 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	MAT'L	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l			
D	36.	15	EA			21.48						
D	37.	152	EA			21.48						
D	38.	28	EA			21.48						
D	39.	28	EA			21.48						
D	40.	30	EA			21.48						
D	40.	8	EA			21.48						
D	40.	8	EA			21.48						
D	41.	53	EA			21.48						
D	42.	11	EA			21.48						
D	43.	11	EA			21.48						
D	44.	7	EA			21.48						
D	47.	114	EA			21.48						
D	48.	15000	FT			21.48						
D	49.	314	EA			21.48						
D	49.	1	LOT			21.48						
	Equipment No.16											
D	Motor flex conduit conn. to 10 HP	8	EA	0.20	2	21.48			\$40		\$40	
D	Motor flex conduit conn. to 20 HP	3	EA	0.20	1	21.48			\$20		\$20	
D	3/4" Sealite flex cond.	4	EA			21.48						
D	Push botton station	8	EA	0.50	8	21.48			\$130		\$130	
D	3/4" Galv rigid cond.	3800	LF	0.01	30	21.48			\$840		\$840	
D	1" Galv rigid cond.	1800	LF	0.01	15	21.48			\$320		\$320	
D	3/4" "L" ftg w cover and gasket	72	EA			21.48						
D	1" "L" ftg w cover and gasket	38	EA			21.48						
D	3/4" Conduit union "UNY"	30	EA			21.48						
D	1" Conduit union "UNY"	18	EA			21.48						
D	3/4" Conduit seal "EYS"	10	EA			21.48						
D	1" Conduit seal "EYS"	5	EA			21.48						
D	3/4" Conduit hub	10	EA			21.48						
D	1" Conduit hub	5	EA			21.48						
D	Control wire 3#14	4100	LF			21.48						
D	Power wire 3#12 w/#12 grd	3800	LF			21.48						
D	Power wire 3#8 w/#10 grd	1800	LF			21.48						
D	Wire term 1/c #14	58	EA			21.48						
D	Wire term 1/c #12	54	EA			21.48						
D	Wire term 1/c #10	8	EA			21.48						
D	Wire term 1/c #8	14	EA			21.48						

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	800 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l				
0	Motor conn. kit #14-#10	5	EA			21.48							
0	Motor conn. kit #8-#4	4	EA			21.48							
0	13. Miscellaneous and support material Equipment No. 17	1	LOT			21.48							
0	1. Install mtr. flex conduit conn. assy. up to	2	EA	0.2	1	21.48			\$20			\$20	
0	2. Install mtr. flex conduit conn. assy. up to	8	EA	0.2	2	21.48			\$40			\$40	
0	3. Install starter & fused disc. switch	8	EA	0.2	2	21.48			\$40			\$40	
0	4. Install 3/4" cond. galv. sti.	3100	FT	0.01	28	21.48			\$580			\$580	
0	5. Install 2" cond. galv. sti.	1100	FT	0.01	9	21.48			\$180			\$180	
0	6. Install 3/4" "L" ftg. w/ cover & gasket	84	EA			21.48							
0	7. Install 2" "LBD" ftg. w/ cover & gasket	21	EA			21.48							
0	8. Install 3/4" cond. union "UNY"	27	EA			21.48							
0	9. Install 2" cond. union "UNY"	8	EA			21.48							
0	10. Install 3/4" cond. seal "EYS"	8	EA			21.48							
0	11. Install 2" cond. seal "EYS"	3	EA			21.48							
0	12. Install 3/4" cond. hub	8	EA			21.48							
0	13. Install 2" cond. hub	3	EA			21.48							
0	14. Install contrl. wire 3-#14	3300	FT			21.48							
0	15. Install power wire 3 #12 w/#12 grd.	2200	FT			21.48							
0	16. Install power wire 3 #3/0 w/#4 grd.	1100	FT			21.48							
0	17. Install wire term. , 600v, 1/c #14	48	EA			21.48							
0	18. Install wire term. , 600v, 1/c #12	28	EA			21.48							
0	19. Install wire term. , 600v, 1/c #4	6	EA			21.48							
0	20. Install wire term. , 600v, 1/c #3/0	9	EA			21.48							
0	21. Install Mtr. cont. kit, 600v, #14 - #10	2	EA			21.48							
0	22. Install Mtr. cont. kit, 600v, #2 - #4/0	8	EA			21.48							
0	22. Miscellaneous and support material	1	LOT			21.48							

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C				
D	8. Install wire term. 600v, 1/c #4	4	EA			21.48						
D	9. Install term. kit 15kv 1/c #2/O	12	EA			21.48						
D	13. Miscellaneous and support material 480V Distribution	1	LOT			21.48						
D	Motor Control Centers	1	LOT	3.00	4	21.48			\$80			\$80
D	Portable Power Distribution Center	1	EA	6.00	8	21.48			\$170			\$170
D	Heat Tracing Panel	1	EA	1.00	1	21.48			\$20			\$20
D	Power Panels	2	EA	1.00	3	21.48			\$80			\$80
D	Lighting Panels	2	EA	1.00	3	21.48			\$80			\$80
D	Capacitors	20	EA	0.30	8	21.48			\$170			\$170
D	Motor Starters	15	EA	0.50	10	21.48			\$210			\$210
D	7. Install 3" "LBD" ftg. w/ cover & gasket	15	EA			21.48						
D	9. Install mini-power xfmr/panel, 30kva	8	EA			21.48						
D	10. Install 3" galv. rigid stl. conduit	800	FT	0.01	5	21.48			\$110			\$110
D	11. Install 3" conduit union "UNY"	15	EA			21.48						
D	12. Install 3" cond. hub	30	EA			21.48						
D	13. Install power wire 3#350KCMw/#1 grd	800	FT			21.48						
D	15. Install wire term. 600v, 1/c #10	30	EA			21.48						
D	16. Install wire term. 600v, 1/c #350kcm	90	EA			21.48						
D	17. Install 3" galv. ridg. stl. conduit	120	FT	0.01	1	21.48			\$20			\$20
D	19. Install 3" "LBD" ftg w/ cover and gasket	3	EA			21.48						
D	11. Install 3" conduit union "UNY"	3	EA			21.48						
D	12. Install 3" cond. hub	8	EA			21.48						
D	13. Install power wire 3#350KCMw/#1 grd	180	FT			21.48						
D	23. Install pow 15. Install wire term. 600v,	8	EA			21.48						
D	22. Install wire 16. Install wire term. 600v,	18	EA			21.48						
D	23. Install 1-1/2" rigid galv cond.	40	FT	0.0	1	21.48			\$20			\$20
D	24. Install 1-1/2" "L" ftg	2	EA			21.48						
D	11. Install 1-1/2" conduit union "UNY"	1	EA			21.48						
D	26. Install 1-1/2" conduit hub	2	EA			21.48						
D	29. Install power wire 3#4w/#8 grd	80	FT			21.48						
D	30. Install wire term. 600v, 1/c #8	2	EA			21.48						
D	31. Install wire term. 600v, 1/c #4	8	EA			21.48						
D	30. Install 2" pvc sch 40 conduit U/G	700	FT	0.01	8	21.48			\$130			\$130
D	31. Install 2" RSG 90 deg elbow	2	EA			21.48						

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: CA.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	800 - Electrical	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC	Mat'l				
2	11. Install 2" conduit union "UNY"	2	EA		5	21.48			\$110			\$110	
0	11. Install 2" conduit seal "EYS"	1	EA			21.48							
0	12. Install 2" cond. hub	2	EA			21.48							
0	42. Install power wire 3#4 w/#8 grd	720	FT			21.48							
0	30. Install wire term. 600v, 1/c #8	2	EA			21.48							
0	31. Install wire term. 600v, 1/c #4	8	EA			21.48							
0	32. Install 1-1/2" rigid galv cond.	80	FT	0.01	1	21.48			\$20			\$20	
0	24. Install 1-1/2" "L" ftg	4	EA			21.48							
0	11. Install 1-1/2" conduit union "UNY"	1	EA			21.48							
0	26. Install 1-1/2" conduit hub	2	EA			21.48							
0	29. Install power wire 3#4w/#8 grd	100	FT			21.48							
0	30. Install wire term. 600v, 1/c #8	2	EA			21.48							
0	31. Install wire term. 600v, 1/c #4	8	EA			21.48							
0	30. Install 2" pvc sch 40 conduit U/G	400	FT	0.01	3	21.48			\$80			\$80	
0	31. Install 2" RSG 90 deg elbow	2	EA			21.48							
0	11. Install 2" conduit union "UNY"	2	EA			21.48							
0	11. Install 2" conduit seal "EYS"	1	EA			21.48							
0	12. Install 2" cond. hub	2	EA			21.48							
0	42. Install power wire 3#4 w/#8 grd	420	FT			21.48							
0	30. Install wire term. 600v, 1/c #8	2	EA			21.48							
0	31. Install wire term. 600v, 1/c #4	8	EA			21.48							
0	32. Install 1-1/2" rigid galv cond.	250	FT	0.01	2	21.48			\$40			\$40	
0	24. Install 1-1/2" "L" ftg	10	EA			21.48							
0	11. Install 1-1/2" conduit union "UNY"	4	EA			21.48							
0	26. Install 1-1/2" conduit hub	2	EA			21.48							
0	29. Install power wire 3#4w/#8 grd	270	FT			21.48							
0	30. Install wire term. 600v, 1/c #8	2	EA			21.48							
0	31. Install wire term. 600v, 1/c #4	8	EA			21.48							
0	30. Install 2" pvc sch 40 conduit U/G	200	FT	0.01	2	21.48			\$40			\$40	
0	31. Install 2" RSG 90 deg elbow	4	EA			21.48							
0	11. Install 2" conduit union "UNY"	4	EA			21.48							
0	11. Install 2" conduit seal "EYS"	2	EA			21.48							
0	12. Install 2" cond. hub	4	EA			21.48							
0	42. Install power wire 3#4 w/#8 grd	240	FT			21.48							

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Unit	Mat'l	Equip					
D	30. Install wire term. 600v, 1/c #8	4	EA			21.48								
D	31. Install wire term. 600v, 1/c #4	12	EA			21.48								
D	32. Install 1-1/2" rigid galv cond.	1400	FT		12	21.48			\$280					\$280
D	24. Install 1-1/2" "L" ftg	58	EA			21.48								
D	11. Install 1-1/2" conduit union "UNY"	20	EA			21.48								
D	26. Install 1-1/2" conduit hub	8	EA			21.48								
D	29. Install power wire 3#4w/#8 grd	1480	FT			21.48								
D	30. Install wire term. 600v, 1/c #8	8	EA			21.48								
D	31. Install wire term. 600v, 1/c #4	24	EA			21.48								
D	30. Install 2" pvc sch 40 conduit U/G	430	FT		4	21.48			\$80					\$80
D	31. Install 2" RSG 90 deg elbow	2	EA			21.48								
D	11. Install 2" conduit union "UNY"	2	EA			21.48								
D	11. Install 2" conduit seal "EYS"	1	EA			21.48								
D	12. Install 2" cond. hub	2	EA			21.48								
D	42. Install power wire 3#4 w/#8 grd	450	FT			21.48								
D	30. Install wire term. 600v, 1/c #8	2	EA			21.48								
D	31. Install wire term. 600v, 1/c #4	8	EA			21.48								
D	Excavation	208	CY		0.11	21.48			\$880					\$880
D	Backfill and compaction	278	CY		0.15	21.48			\$1,220					\$1,220
D	Load haul and dump	278	CY		0.10	21.48								
D	Ductbank	98	CY		1.08	21.48			\$3,070					\$3,070
D	13. Miscellaneous and support material	1	LOT			21.48								
<u>Standby Electrical</u>														
D	1. Install generator	1	EA		10.0	21.48			\$300					\$300
D	2. Install Transfer Switch (30-TS-001)	1	EA		2.0	21.48			\$80					\$80
D	3. Install 3" conduit galv. rigid stl.	510	FT		4	21.48			\$80					\$80
D	4. Install 3" "LBD" ftg. w/cover & gasket	18	EA			21.48								
D	5. Install 3" conduit union "UNY"	8	EA			21.48								
D	7. Install 3" cond. hub	18	EA			21.48								
D	8. Install power wire 3#350kcm w/ #1/0 g	880	FT			21.48								
D	9. Install wire term. 600v, 1/c #10	18	EA			21.48								
D	10. Install wire term. 600v, 1/c #350kcm	54	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								
D	14. Install Switchgear (32-sg-001)	1	EA		6.0	21.48			\$170					\$170

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: CA.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Lab	SIC	Mat'l					
D	3. Install power transf. grdg.	2	EA	0.50	1	21.48				\$20				\$20
D	4. Install switchgear grdg.	2	EA	0.50	1	21.48				\$20				\$20
D	5. Install MCC grounding	8	EA	0.50	6	21.48				\$130				\$130
D	6. Install storage tank grndg.	20	EA	0.40	11	21.48				\$240				\$240
D	7 Vessel or exchanger grdg	2	EA	0.40	1	21.48				\$20				\$20
D	8. Install stl. colm. grdg.	102	EA	0.20	28	21.48				\$800				\$800
D	9. Install fence post grdg.	6	EA	0.20	2	21.48				\$40				\$40
D	10. Install fence gate grdg.	2	EA	0.20	1	21.48				\$20				\$20
D	11. Install misc. equip. grdg.	10	EA	0.20	3	21.48				\$60				\$60
D	12. Install #4/O to #4/O "T" weld	80	EA			21.48								
D	13. Install #4/O to #2 "T" weld	110	EA			21.48								
D	14. Install 1/c #2 str. cu grd. wire	2500	FT	0.00	7	21.48				\$150				\$150
D	15. Install 1/c #4/o str. cu grd. wire	4500	FT	0.00	12	21.48				\$260				\$260
D	16. Install mach. excav. for grd. well	4	CY			21.48								
D	17. Install mach. trench. for grd. wire	224	CY			21.48								
D	18. Backfill & compaction	281	CY			21.48								
<u>Lightning Protection</u>														
D	1. Install air term. w/ base 3/8" x 10" rf. r	50	EA	0.3	21	21.48				\$450				\$450
D	2. Install #2/O str. cu wire	1800	FT	0.00	5	21.48				\$110				\$110
D	3. Install #2/O - #4/O "T" exothermic weld	10	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								
<u>Plant & Instrument Air 4Q</u>														
D	1. Install mtr. flex cond. conn. assy. 10hp	1	EA	0.2		21.48								
D	2. Install mtr. flex cond. conn. assy. 100hp	2	EA	0.20	1	21.48				\$20				\$20
D	3. Install 3/4" sealitte flex conmd w/2 comp	2	LOT			21.48								
D	4. Install starter & fused disc. switch	3	EA	1.00	4	21.48				\$80				\$80
D	5. Install start-stop button station	3	EA	1.00	4	21.48				\$80				\$80
D	6. Install 3/4" conduit galv. stl.	780	FT	0.01	8	21.48				\$130				\$130
D	7. Install 2" conduit galv. stl.	185	FT	0.01	2	21.48				\$40				\$40
D	8. Install 3/4" "L" fig. w/ cover & gasket	30	EA			21.48								
D	9. Install 1-1/2" "LBD" fig. w/ cover & gas	5	EA			21.48								
D	10. Install 3/4" conduit union "UNY"	12	EA			21.48								
D	11. Install 1-1/2" conduit union "UNY"	3	EA			21.48								
D	12. Install 3/4" conduit seal "EYS"	6	EA			21.48								

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: CA.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Equip	Mat'l					
0	13. Install 1-1/2" conduit seal "EYS"	2	EA			21.48							
0	14. Install 3/4" conduit hub	6	EA			21.48							
0	15. Install 1-1/2" conduit hub	2	EA			21.48							
0	16. Install cntrl. wire str. cu 3#14	430	FT			21.48							
0	17. Install power wire str. cu 3#12 w/#12gr	850	FT			21.48							
0	19. Install wire term. 600v 1/c#14	18	EA			21.48							
0	20. Install wire term. 600v 1/c#12	36	EA			21.48							
0	21. Install wire term. 600v 1/c#4	3	EA			21.48							
0	22. Install wire term. 600v 1/c#4/O	8	EA			21.48							
0	23. Install mtr. cont. kit 600v #14-#10	2	EA			21.48							
0	24. Install mtr. cont. kit 600v #2-#4/O	2	EA			21.48							
0	13. Miscellaneous and support material	1	LOT			21.48							
	<u>Breathing Air System</u>												
0	1. Install motor flex cond. 50hp	2	EA	0.2	1	21.48			\$20				\$20
0	2. Install starter & fused disct. switch	2	EA	1.0	3	21.48			\$80				\$80
0	3. Install 1-1/2" conduit galv. rigid stl.	800	FT	0.01	7	21.48			\$150				\$150
0	4. Install 1-1/2" "L" ffg. w/cover & gasket	16	EA			21.48							
0	5. Install 1-1/2" conduit union "UNY"	8	EA			21.48							
0	6. Install 1-1/2" conduit seal "EYS"	2	EA			21.48							
0	7. Install 1-1/2" cond. hub	2	EA			21.48							
0	8. Install power wire 3#4 w/ #8 grd.	830	FT			21.48							
0	9. Install wire term. 600v, 1/c #8	4	EA			21.48							
0	10. Install wire term. 600v, 1/c #4	12	EA			21.48							
0	11. Install mtr. cont. kit 600v #8-#4	2	EA			21.48							
0	13. Miscellaneous and support material	1	LOT			21.48							
0	Electrical for Process, HVAC and Shield Door	1	LOT	122	189	21.48			\$3,630				\$3,630

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Labor	SIC	Mat'l					
D	12. Install mtr. conct. kit, 600v #14-#10	2	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								
D	Motor flex conduit conn. to 10 HP	1	EA	0.20		21.48								\$20
D	3/4" Sealite flex cond.	1	EA	0.20		21.48								\$80
D	Push botton station	1	EA	1.00	1	21.48			\$20					\$80
D	3/4" Galv rigid cond.	370	LF	0.01	3	21.48			\$40					\$40
D	1" Galv rigid cond.	185	LF	0.01	2	21.48								
D	3/4" "L" ftg w cover and gasket	8	EA			21.48								
D	1" "L" ftg w cover and gasket	4	EA			21.48								
D	3/4" Conduit union "UNY"	4	EA			21.48								
D	1" Conduit union "UNY"	2	EA			21.48								
D	3/4" Conduit seal "EYS"	1	EA			21.48								
D	1" Conduit seal "EYS"	1	EA			21.48								
D	3/4" Conduit hub	1	EA			21.48								
D	1" Conduit hub	1	EA			21.48								
D	Control wire 3#14	420	LF			21.48								
D	Power wire 3#12 w/#12 grd	420	LF			21.48								
D	Power wire 3#8 w/#10 grd	180	LF			21.48								
D	Wire term 1/c #14	6	EA			21.48								
D	Wire term 1/c #12	8	EA			21.48								
D	Motor conn. kit #14-#10	1	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								

DETAIL ESTIMATE WORKSHEETS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: CA.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

ITEM NO.	800 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Equip	Mat'l					
Equipment No. 73													
D	Motor flex conn. to 15 hp, 20hp	6	EA	0.20	2	21.48			\$40				\$40
D	Motor flex conn. to 25 hp, 30hp	5	EA	0.20	1	21.48			\$20				\$20
D	Push button station	11	EA	1.00	15	21.48			\$320				\$320
D	Disconnect switch 30 A, 600 V	1	EA	2.00	3	21.48			\$80				\$80
D	Disconnect switch 60 A, 600 V	1	EA	2.00	3	21.48			\$80				\$80
D	Disconnect switch 200 A, 600 V	1	EA	2.00	3	21.48			\$80				\$80
D	1. Install 3/4" flex cond. w/ 2 connectors	1	LOT	0.2		21.48							
D	3. Install 2" flex cond. w/2 connectors	7	LOT	0.20	2	21.48			\$40				\$40
D	3. Install 3" flex cond. w/2 connectors	3	LOT	0.20	1	21.48			\$20				\$20
D	5. Install 3/4" conduit galv. rigid stl.	1480	FT	0.01	12	21.48			\$280				\$280
D	6. Install 1-1/2" conduit galv. rigid stl.	980	FT	0.01	8	21.48			\$170				\$170
D	7. Install 3" conduit galv. rigid stl.	2830	FT	0.01	24	21.48			\$520				\$520
D	8. Install 3/4" "L" ftg. w/cover & gasket	30	EA			21.48							
D	10. Install 1-1/2" "L" ftg. w/cover & gasket	20	EA			21.48							
D	3"-LBD" ftg with cover and gasket	58	EA			21.48							
D	11. Install 3/4" conduit union "UNY"	12	EA			21.48							
D	12. Install 1-1/2" conduit union "UNY"	8	EA			21.48							
D	13. Install 3" conduit union "UNY"	20	EA			21.48							
D	14. Install 3/4" conduit seal "EYS"	12	EA			21.48							
D	15. Install 1-1/2" conduit seal "EYS"	3	EA			21.48							
D	16. Install 3" conduit seal "EYS"	9	EA			21.48							
D	17. Install 3/4" conduit hub	4	EA			21.48							
D	18. Install 1-1/2" conduit hub	3	EA			21.48							
D	19. Install 3" conduit hub	9	EA			21.48							
D	Control wire 3#14	5840	FT			21.48							
D	20. Install power wire 3#12 w/ #12 grd.	1020	FT			21.48							
D	21. Install power wire 3#10 w/ #10 grd.	3080	FT			21.48							
D	Heat Tracing	1	LOT	4.00	8	21.48			\$130				\$130

COMMERCIAL

ESTIMATE NO.: C4-01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

Fluor Fernald, Inc.

ITEM NO.	800 - Electrical	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	SIC					
D	22. Install power wire 3#1 w/ #6 grd.	1030	FT			21.48							
D	23. Install power wire 3#500 w/ #1/0 grd.	3080	FT			21.48							
D	24. Install wire term. 600v, 1/c #14	80	EA			21.48							
D	24. Install wire term. 600v, 1/c #12	34	EA			21.48							
D	25. Install wire term. 600v, 1/c #10	8	EA			21.48							
D	26. Install wire term. 600v, 1/c #6	15	EA			21.48							
D	27. Install wire term. 600v, 1/c #1	15	EA			21.48							
D	28. Install wire term. 600v, 1/c #1/0	17	EA			21.48							
D	29. Install wire term. 600v, 1/c #500	51	EA			21.48							
D	30. Install mtr. cont. kit, 600V, #14-#10	8	EA			21.48							
D	13. Miscellaneous and support material	1	LOT			21.48							
Equipment No. 82													
D	1. Install 3/4" flex cond. w/ 2 connectors	33	LOT	0.2	8	21.48			\$180				\$180
D	4. Install starter & fused disc. switch	12	EA	1.00	17	21.48			\$370				\$370
D	Push button station	7	EA	1.00	10	21.48			\$210				\$210
D	5. Install 3/4" conduit galv. rigid stl.	12800	FT	0.01	108	21.48			\$2,280				\$2,280
D	8. Install 3/4" "L" fig. w/cover & gasket	258	EA			21.48							
D	11. Install 3/4" conduit union "UNY"	104	EA			21.48							
D	14. Install 3/4" conduit seal "EYS"	38	EA			21.48							
D	17. Install 3/4" conduit hub	38	EA			21.48							
D	20. Install power wire 3#8 w/ #10 grd.	8400	FT			21.48							
D	21. Install power wire 3#12 w/ #12 grd.	1680	FT			21.48							
D	22. Install power wire 3#10 w/ #10 grd.	1680	FT			21.48							
D	25. Install wire term. 600v, 1/c #12	32	EA			21.48							
D	26. Install wire term. 600v, 1/c #10	72	EA			21.48							
D	27. Install wire term. 600v, 1/c #8	120	EA			21.48							
D	13. Miscellaneous and support material	1	LOT			21.48							
Equipment No. 83													
D	1. Install 3/4" flex cond. w/ 2 connectors	5	LOT	0.2	1	21.48			\$20				\$20
D	2. Install starter & fused disc. switch	5	EA	1.00	7	21.48			\$150				\$150
D	3. Install 3/4" conduit galv. rigid stl.	2100	FT	0.01	17	21.48			\$370				\$370
D	4. Install 3/4" "L" fig. w/cover & gasket	42	EA			21.48							
D	5. Install 3/4" conduit union "UNY"	20	EA			21.48							
D	6. Install 3/4" conduit seal "EYS"	8	EA			21.48							
D	7. Install 3/4" conduit hub	8	EA			21.48							

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

Fluor Fernald, Inc.

PROJECT NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Equip	Mat'l	Equip					
D	8. Install power wire 3#12 w/ #12 grd.	2280	FT			21.48								
D	9. Install wire term. 600v, 1/c #12	40	EA			21.48								\$20
D	13. Miscellaneous and support material	1	LOT			21.48								\$80
	<u>Sampling System</u>													\$210
D	1. Install 3/4" flex cond. w/ 2 connectors	3	LOT		0.2	21.48								
D	2. Install starter & fused disc. switch	3	EA		1.00	21.48								
D	3. Install 3/4" conduit galv. rigid stl.	1200	FT		0.01	21.48								
D	4. Install 3/4" "L" ftg. w/cover & gasket	24	EA			21.48								
D	5. Install 3/4" conduit union "UNY"	9	EA			21.48								
D	6. Install 3/4" conduit seal "EYS"	3	EA			21.48								
2	7. Install 3/4" conduit hub	3	EA			21.48								
D	8. Install power wire 3#8 w/ #10 grd.	830	FT			21.48								
D	9. Install wire term. 600v, 1/c #10	15	EA			21.48								
D	9. Install wire term. 600v, 1/c #8	8	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								
	<u>Equipment No. 85</u>													\$1,850
D	1. Install 3/4" conduit galv. rigid stl.	10400	FT		0.01	21.48								
D	2. Install 3/4" "L" ftg. w/cover & gasket	208	EA			21.48								
D	3. Install 3/4" conduit union "UNY"	118	EA			21.48								
D	4. Install 3/4" conduit seal "EYS"	118	EA			21.48								
D	5. Install 3/4" conduit hub	118	EA			21.48								
D	6. Install power wire 3#12 w/ #12 grd.	8000	FT			21.48								
D	Pan and tilt control wire 3#14	8000	FT			21.48								
D	Video co-axial cable	8000	FT			21.48								
D	7. Install wire term. 600v, 1/c #14	312	EA			21.48								
D	7. Install wire term. 600v, 1/c #12	418	EA			21.48								
D	9. Install wire term. 600v co-axial cable	104	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								
	<u>Fire Detection & Alarm</u>													\$750
D	1. Install manual smoke detectors	1	LOT		25.0	21.48								
	misc. conduit fitting & wires													
	<u>Health Protection</u>													
D	1. Install flex cond. assy. for monitors	28	EA		0.2	21.48								\$170
D	2. Install stn. box (20" x 20" x 6")	2	EA		0.5	21.48								\$20
D	3. Install 3/4" cond. galv. stl.	1450	FT		0.01	21.48								\$280
D	4. Install 1" cond. galv. stl.	200	FT		0.01	21.48								\$40

ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: NS1AR

Fluor Fernald, Inc.

ITEM NO.	600 - Electrical	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Labor	SIC	Mat'l					
D	5. Install 1-1/2" cond. galv. stl.	170	FT	0.01	1	21.48				\$20			\$20	
D	6. Install 2" cond. galv. stl.	80	FT	0.01	1	21.48				\$20			\$20	
D	7. Install 3/4" "L" fgt. w/cover & gasket	47	EA			21.48								
D	8. Install 1" "L" fgt. w/cover & gasket	6	EA			21.48								
D	9. Install 1-1/2" "L" fgt. w/cover & gasket	8	EA			21.48								
D	10. Install 2" "L" fgt. w/cover & gasket	4	EA			21.48								
D	11. Install 3/4" "T" fgt. w/cover & gasket	34	EA			21.48								
D	Install 2" - conduit seal "EYS"	2	EA			21.48								
D	12. Install 1" "T" fgt. w/cover & gasket	6	EA			21.48								
D	13. Install 1-1/2" "T" fgt. w/cover & gasket	6	EA			21.48								
D	14. Install 2" "T" fgt. w/cover & gasket	4	EA			21.48								
D	15. Install 3/4" conduit union "UNY"	13	EA			21.48								
D	16. Install 1" conduit union "UNY"	6	EA			21.48								
D	17. Install 1-1/2" conduit union "UNY"	6	EA			21.48								
D	18. Install 2" conduit union "UNY"	2	EA			21.48								
D	19. Install 1/2" conduit drain	21	EA			21.48								
D	20. Install 1pr #16 str.cu shld. w/ pvc 300v	3600	FT			21.48								
D	21. Install 1pr-#16 wire termination, 300v	58	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								
	<u>Power Wiring to Monitors & CAM's</u>													
D	3/4" Galv rigid cond.	1350	FT	0.01	11	21.48				\$240			\$240	
D	3/4" GRFX box	28	EA	0.50	20	21.48				\$430			\$430	
D	3/4" "L" fgt with cover and gasket	43	EA			21.48								
D	3/4" "T" fgt with cover and gasket	7	EA			21.48								
D	3/4" Conduit union "UNY"	17	EA			21.48								
D	3/4" Conduit hub	4	EA			21.48								
D	3/4" Conduit seal "EYS"	4	EA			21.48								
D	Power wire 2#12 w/ #12 grd	1850	FT			21.48								
D	1/c #12 wite term	100	EA			21.48								
D	13. Miscellaneous and support material	1	LOT			21.48								
	<u>Distributed Control System</u>													
D	1. Install 1-1/2" cond. galv. stl.	4000	FT	0.01	33	21.48				\$710			\$710	
D	2. Install 2" cond. galv. stl.	8500	FT	0.01	70	21.48				\$1,500			\$1,500	
D	3. Install 1-1/2" "L" fgt. w/cover & gasket	120	FT			21.48								
D	4. Install 2" "L" fgt. w/ cover & gasket	255	FT			21.48								
D	5. Install 1-1/2" cond. union "UNY"	45	EA			21.48								

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

Fluor Fernald, Inc.

ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

ITEM NO.	000 - Civil & Excavation All Facilities	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	SIC	MAT'L	EQUIP	TOTAL
				Unit	Total		Labor	SIC	Mat'l					
D	A. RECEIVING & LAYDOWN AREAS	2,500	SY			21.48								
D	1. for EQUIPMENT - 150' x 150' x 1'													
D	i. Subgrade Pavement Base	2,500	SY	8.00	11	21.48			\$240					\$240
D	ii. Base Course, 12" deep	2,500	SY	3.20	4	21.48			\$80					\$80
D	iii. Stabilization Fabric, 6 oz.	2,500	SY			21.48								
D	iv. Penetration crushed stone, 4" thk	2,500	SY			21.48								
D	2. extension of utilities													
D	i. Tie-in water supply	1	LS			21.48								
D	ii. Tie-in electrical system	1	LS			21.48								
D	iii. Subgrade pavement base	225	SY			21.48								
D	iv. Base Course 12" deep	225	SY			21.48								
D	B. RELOCATE EXISTING ITEMS													
D	i. Subgrade Pavement Base	1,000	SY	0.001	1	21.48			\$20					\$20
D	ii. Base Course, 12" deep	1,000	SY			21.48								
D	iii. Stabilization Fabric, 6 oz.	1,000	SY			21.48								
D	iv. Penetration crushed stone, 4" thk													
D	- Site Preparation													
D	- Facility Construction													
mC	C. STORMWATER MANAGEMENT													
mC	1. WASTE PREP BLDG.													
D	i. Excec. footings,Piers,gradebeams	0.25	BCY			21.48	#DIV/0!							
mC	ii. Backfill footings,Piers,gradebeams	0.22	ICY			21.48	#DIV/0!							
D	iii. Haul excess to stockpile	0.48	LCY			21.48	#DIV/0!							
mC	iv. Excec. Interior Wall footings	0.33	BCY			21.48	#DIV/0!							
mC	v. Backfill Interior-Wall Footings	0.37	ICY			21.48	#DIV/0!							
D	vi. Haul excess to stockpile	1.14	LCY			21.48	#DIV/0!							
Take-off Allowance														
Subtotal Direct Cost														350
TOTAL														\$350

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4-2001-05-003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

SITE SPECIFIC
 EFFICIENCY / MULTIPLIER ANALYSIS

DATE: 10-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSTAR

	PERCENT OF INFLUENCE ON CHART MANHOURS										WTD VALUE	PROD. RESULT		
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE				
CRAFT SKILL (NOTE 1)	POOR	POOR		FAIR							EXCELLENT		12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR									8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICESNOW			RAIN								20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000 TO 10,000 FT								5.0%	0.05
WORK SPACE				200 SF	250 SF					300 SF			10.0%	0.08
WORK WEEK													15.0%	0.15
50 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS					UP TO 3 WEEKS			0.0%	0
60 HOUR WORK WEEK				OVER 7 WEEKS	3 TO 7 WEEKS					UP TO 3 WEEKS			0.0%	0
SHIFTWORK													3.0%	0.03
2ND SHIFT					2ND SHIFT								5.0%	0.05
3RD SHIFT					3RD SHIFT								4.0%	0.04
PROJECT SIZE													8.0%	0.08
PLANT TYPE					REVAMP ONLY					NEW IN EXIST PLT			10.0%	0.10
AREAJUNCTION INFLUENCE	STRONG		MILD		SOME					GRASS ROOTS			100.0%	83.6%

NOTES:
 1. TURNOVER HAS BEEN CONSIDERED
 2. FOR EXTERIOR WORK ONLY

EFFICIENCY (AS A % OFF CHART MANHOURS)

MULTIPLIER-(1 TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S)

EFFICIENCY FACTORS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4-2001-05-003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HSIAR

Fluor Fernald, Inc.

EXAMPLE:

STANDARD CHART MANHOURS -	NET	100
EFFICIENCY FACTORS:		
* SITE SPECIFIC (SEE APPENDIX A)	20%	20.0
S/T - BASE UNIT MANHOURS		120
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)		120
* TASK SPECIFIC (confined space, high elevation, congestion, etc.)		120
* PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod. C		C		C +		B	
PRODUCTIVITY HOURS	MULTIPLIER	MH's								
(AS A %) / ADD MH's	15.00%	18	71.00%	85	79.00%	85	147.00%	178	328.00%	391
(AS A MULTIPLIER) / TOTAL HRS	1.15	138	1.71	205.2	1.79	214.8	2.47	298.4	4.26	511.2
TOTAL MULTIPLIER w/SITE PROD.	1.38		2.052		2.148		2.984		5.112	
<p>NOTE: Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.</p> <p>(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)</p> <p>Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's. (SEE APPENDIX C - HEALTH PHYSICS)</p>										
	14.0	Man Days	21.0	Man Days	21.0	Man Days	30.0	Man Days	51.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

EFFICIENCY FACTORS

PROJECT: Site 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

PPE MULTIPLIER DEVELOPEMENT

		D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY					
	SUPPORT TEAM					3
	TOTAL CREW	7	7	7	7	10
CREW SIZE RATIO		1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR		0.86	0.88	0.88	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR		1	0.86	0.82	0.75	0.70
NET PRODUCTIVITY RATIO		0.86	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER		1.04	1.71	1.79	2.47	4.26
<p>These factors were based on Tables B.1 and B.2, Moderate Work Efforts, 86F to 85F temperature of "Hazardous Waste Cost Control" by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).</p>						
AVAILABLE WORK TIME FACTOR						
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDITIONAL SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
	TOTAL	25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY		4	4	4	4
	MINUTES		15	15	20	25
	TOTAL		80	80	80	100
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	3
	MINUTES	N/A	15	15	15	15
	TOTAL		30	30	30	45
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
	TOTAL		80	80	80	80
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS)	QUANTITY	N/A	4	4	8	8
	MINUTES	N/A	15	15	15	15
	TOTAL		20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
	TOTAL				40	40
AVAILABLE WORK TIME		575	405	405	325	280
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

EFFICIENCY FACTORS

PROJECT: Sites 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4-2001-05-003
 CLIENT: DOE
 WBS NO.: 1.1.HD

Fluor Fernald, Inc.

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

EXAMPLE:

- STANDARD CHART MANHOURS - NET 100
- EFFICIENCY FACTORS:**
- SITE SPECIFIC (SEE APPENDIX A) 20% 20.0
 - S/T - BASE UNIT MANHOURS 120
- OVERTIME PRODUCTIVITY FACTOR
 (SEE DETAIL WORKSHEET BACK-UP) _____ 120
- TASK SPECIFIC (confined space, high elevation, congestion, etc.) _____ 120
 - PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'C'		C		C +		B	
PRODUCTIVITY HOURS	MULTIPLIER	MH's								
(AS A %)/ADD MH's	15.00%	18	71.00%	85	78.00%	85	147.00%	178	328.00%	391
(AS A MULTIPLIER)/TOTAL HRS	1.15	138	1.71	205.2	1.79	214.8	2.47	298.4	4.26	511.2
TOTAL MULTIPLIER w/SITE PROD.	1.38		2.052		2.148		2.984		5.112	
<p>NOTE: Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.</p> <p>(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6008 8.10)</p> <p>Total hours worked in a specific PPE level divided by 10 hour working days - (PPE) ManDays to determine material cost of PPE's. (SEE APPENDIX C - HEALTH PHYSICS)</p>										
	14.0	Man Days	21.0	Man Days	21.0	Man Days	30.0	Man Days	51.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
ESTIMATE NO.: C4-2001-05-003
CLIENT: DOE
WBS NO.: 1.1.H.D

Fluor Fernald, Inc.

DATE: 16-May-01
ESTIMATOR: Johnson
LOCATION: FERNALD
TASK NO.: HS1AR

CAPITAL PLANT

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY			
			* Scheduled in PPE's Div. by WORK HOURS / DAY)			
		\$'s		MAN DAYS	MAT'L.\$'s	LEVEL
C / C+ / B : F/HF MASK w/RESP.&CART.						
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4			C / C+ / B
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	4			C / C+ / B
GLOVE LINER - DISPOSABLE	PR	0.24	4			C / C+ / B
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4			C / C+ / B
GLOVE, WORK - DISPOSABLE	PR	1.02	4			C / C+ / B
APR CARTRIDGES - DISPOSABLE	PR	11.74	4			C / C+ / B
SUB-TOTAL		22.18	4			

(DOUBLE PPE)

\$/MD =

PPE LEVEL mC

DESCRIPTION	UNIT	\$'s		MAN DAYS	MAT'L.\$'s	LEVEL
ULL DRESS w/ FACE SHIELD						
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	4	50	\$892	mC
GLOVE LINER - DISPOSABLE	PR	0.24	4	50	\$48	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	4	50	\$52	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	4	50	\$204	mC
SUB-TOTAL		5.98	4		\$1,196	

\$/MD =

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6			D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6			C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6			C
SCBA	EA	1894.00	2			B
COOL VESTS	EA	137.50	6			C/B
THERMO STRIPS	EA	50.00	6			C/B
SUB-TOTAL						

MAT'L.\$'s
\$1,200

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FD FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

EFFICIENCY FACTORS

PROJECT: Sios 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4.01.05.003
 CLIENT: DOE
 WBS NO.: 1.1.H.0

DATE: 18-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

Fluor Fernald, Inc.

PPE MULTIPLIER DEVELOPMENT

	D	mC	C	C +	B
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7
	WORKER-BUDDY				
	SUPPORT TEAM				3
	TOTAL CREW	7	7	7	7
CREW SIZE RATIO	1.00	1.00	1.00	1.00	0.70
AVAILABLE WORK TIME FACTOR	0.98	0.88	0.88	0.54	0.48
PPE LABOR PRODUCTIVITY FACTOR	1	0.88	0.82	0.75	0.70
NET PRODUCTIVITY RATIO	0.98	0.585	0.558	0.405	0.235
NET PRODUCTIVITY MULTIPLIER	1.04	1.71	1.79	2.47	4.26

These factors were based on Tables B.1 and B.2, Moderate Work Efforts, 88F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mC	C	C +	B
TOTAL WORK MINUTES per DAY - 4 - 10's		600	600	600	600	600
ADDITIONAL SITE SAFETY MEETINGS NOT INCLD. IN BASE MH's	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY		4	4	4	4
	MINUTES		15	15	20	25
TOTAL			60	60	80	100
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	3
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	45
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			80	80	80	80
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS)	QUANTITY	N/A	4	4	8	8
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	40	40
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	4	4
	MINUTES	N/A	N/A	N/A	10	10
TOTAL					40	40
AVAILABLE WORK TIME		575	405	405	325	280
AVAILABLE WORK TIME FACTOR		0.96	0.68	0.68	0.54	0.48

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

HEALTH PHYSICS

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
ESTIMATE NO.: C4-2001-05-003
CLIENT: DOE
WBS NO.: 1.1.H.D

'Fluor Fernald, Inc.'

DATE: 16-May-01
ESTIMATOR: Johnson
LOCATION: FERNALD
TASK NO.: HS1AR

**--MEDICAL MONITORING--
 CAPITAL - PLANT**

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	53	212	\$21.71	\$4,600
ANNUAL PHYSICALS	1	4	53	212	\$21.71	\$4,600
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	53	53	\$21.71	\$1,150
SUB-TOTAL						\$10,350

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	6	1	53	320	\$21.71	\$6,950
SUB-TOTAL						\$6,950

RANDOM DRUG TESTING

WKRS	TESTS	HRS	TOTAL HOURS	LABOR \$'s		
3	56	2	112	\$2,400		
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
650	226	3	0.004615385	53	0.244615385	228

	LABOR \$'s THRU SAFETY	LABOR \$'s	TOTAL LABOR	TOTAL MAT'L	GRAND TOTAL
WORK DELAYS CAUSED BY MONITORING	2.0%	\$1,802,560	\$36,100		
WORK DELAYS CAUSED BY RAD CHECKING	2.0%	\$1,802,560	\$36,100		
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET		\$91,900	\$1,200	\$93,100	

ACTIVITY DURATIONS

Fluor Fernald, Inc.

PROJECT: Silos 1 & 2 Chemical Stabilization (Baseline Demolition)
 ESTIMATE NO.: C4-2001-05-003
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: FERNALD
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	01-May-01	01-Jan-04	02-Jul-04	02-Jan-05		12.1 MONTHS
						MONTHS
TOTAL						12.1 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
a.	1239.6 MONTHS
b.	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS		01-Jan-02	03-Jul-03	01-Jan-05		36.1 MONTHS
						36.1 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NO. OF WORKERS FOR CERCLA/SAT AND HEALTH PHYSICS COSTS.

S:\ESTIMATE\Roger\2001 Silo estimates\Chemical Silo 1&2r\DEMO Chemical stabilization 2001.xls\Duration

Memorandum

To:	Jeff Stone, MS52-4	Date:	May 17, 2001
Location:	Fernald 	Reference:	N/A
From:	Ken Kepler, MS80-3	Fernald #:	M:OOTP(PC/EST):2001-0073
Location:	Springdale	Client:	DOE DE-AC24-01OH20115
Extension:	648-6767	Subject:	SILOS 1&2 HAUL ROAD & PARKING (DEMOLITION)

c: File Record Subject ESTIMATE C4-2001-05-006
Dennis Nixon, MS52-4

Attached are two (2) copies for the SILOS 1&2 HAUL ROAD & PARKING (DEMOLITION).

To request any additional copies of this estimate or for any questions, please contact Roger Johnson on extension 4140.

KGK:RLJ:hmp
Attachment

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking (Demolition)
WBS:1.1.H.D
PROJECT ENGINEER: Jeff Stone
ESTIMATOR: R Johnson
ESTIMATE NUMBER: C4.01.05.006

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input type="checkbox"/>	Equipment List	<input type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input checked="" type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4.01.05.006 is to provide a cost for the demolition of the concrete, electrical (poles, conduit and cable) and the three trailers. This material will be hauled to the OSDf for on-site disposal. The truck scale will also be hauled to the OSDf. The construction estimate quantities were used for the demolition units. No salvage value for any material and equipment was assumed. The roads, parking lot, culvert, guard rails at the culvert and and the gate at Willey Road will remain. All costs are in 2001 dollars.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking (Demolition)
WBS:1.1.H.D
PROJECT ENGINEER: Jeff Stone
ESTIMATOR: R Johnson
ESTIMATE NUMBER: C4.01.05.006

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
- Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

WASTE PROGRAM MANAGEMENT:

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- Waste Program Management dollars provided by the Project Engineer.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking (Demolition)

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.006

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

G & A (HO EXPENSE)

This expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

HEALTH PHYSICS:

It was assumed that this will be a clean area and no PPE requirements were considered

RISK BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking (Demolition)
WBS:1.1.H.D
PROJECT ENGINEER: Jeff Stone
ESTIMATOR: R Johnson
ESTIMATE NUMBER: C4.01.05.006

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The construction estimate was the primary source for the quantities
- Unit man-hours were from site D & D estimates previously used.
- All labor, material and equipment costs are in 2001 dollars.
-

EXCLUSIONS:

- Permits and fees.
- FFS G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
-

ESTIMATE SUMMARY SHEET

PROJECT: Silo 1 & 2 Haul Road & Parking (Dem)
 ESTIMATE #: C4.01.05.006
 CLIENT: DOE
 WBS #: 1.1.H.D

FLUOR FERNALD

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$	
Mobilization/Demobilization	220		\$5,000				\$5,000	
Site Work	65		\$1,400				\$1,400	
Concrete	579		\$13,000				\$13,000	
Equipment	112		\$2,500				\$2,500	
Electrical	105		\$2,400				\$2,400	
DIRECT FIELD COSTS TOTAL								
	1,081	\$22.48	\$24,300				\$24,300	
SUPERVISION - CONTRACTOR	811		\$18,200				\$18,200	
SMALL TOOLS & CONSUMABLES	-	-	-		\$1,900		\$1,900	
MISC. EQUIP. RENTAL	-	-	-			\$25,900	\$25,900	
TEMPORARY FACILITIES	43		\$1,000		\$1,000		\$2,000	
TEMPORARY UTILITY HOOK-UP	35		\$800		\$400		\$1,200	
JOB CLEAN-UP	65		\$1,500		\$500		\$2,000	
PER DIEM / SUBSISTANCE	-	-	-					
HEALTH PHYSICS S/C	107		\$2,400				\$2,400	
CERCLA - TRAINING	300		\$6,700				\$6,700	
GET/SITE ACCESS & JOB SPECIFIC TRAINING	36		\$800				\$800	
PAYROLL BURDENS & BENEFITS	-	-	\$31,700				\$31,700	
OVERHEAD & PROFIT	-	-	-	\$23,400			\$23,400	
BOND	-	-	-	\$1,800			\$1,800	
SALES TAX	-	-	-		\$200	\$1,600	\$1,800	
INDIRECT FIELD COSTS TOTAL								
	1,397		\$63,100	\$25,200	\$4,000	\$27,500	\$119,800	
DIRECT & INDIRECT FIELD COSTS TOTAL								
	2,477	\$35.28	\$87,400	\$25,200	\$4,000	\$27,500	\$144,100	
TARGET ESTIMATE							(FY 01 DOLLARS)	\$144,100

ESTIMATE PERFORMED BY ESTIMATING SERVICES

ESTIMATE SUMMARY SHEET

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolitio)
 ESTIMATE NO.: C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

FACTORS

FIXED PRICE S	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$24,300					\$24,300
IFC COST FACTOR	4.8940		1.7346	#DIV/0!	-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2119	1.2119	1.2119	1.2119	1.2119	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	5.9312	1.2119	2.2284	1.2847	1.2847	
BASE ESTIMATE \$'s	\$144,129					\$144,129
BASE FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	5.9312	1.2119	2.2284	1.2847	1.2847	
FPS TARGET ESTIMATE (FY01 \$)	\$144,129					\$144,129

NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY01 for input to microframe. SEE De-Escalated Summary...N/A
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G62.

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)
 ESTIMATE NO.: C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS		Rate	COST / UNIT			LABOR	S/C	MATT'L	EQUIP	TOTAL
				Unit	Total		Labor	S/C	Mat'l					
	Mobilization/Demobilization				220				\$5,000					\$5,000
	Site Work				65				\$1,400					\$1,400
	Concrete				579				\$13,000					\$13,000
	Equipment				112				\$2,500					\$2,500
	Electrical				105				\$2,400					\$2,400
	Subtotal Direct Cost	1	LOT		1,081				\$22,480		\$0	\$0	\$0	\$24,300

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)

ESTIMATE NO.: C4.01.05.006

CLIENT: DOE

WBS NO.: 1.1.H.D

DATE: 16-May-01

ESTIMATOR: Johnson

LOCATION: Fernald

TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Equip	Mat'l					
D	1585	CY	0.00	0	21.49			\$0				\$0
D	610	CY	0.00	0	21.49			\$0				\$0
D	1015	CY	0.00	0	21.49			\$0				\$0
D	2.3	acre	0.00	0	21.49			\$0				\$0
D	2.3	acre	0.00	0	21.49			\$0				\$0
D	3.3	acre	0.00	0	21.49			\$0				\$0
D	11111	SY	0.00	0	21.49			\$0				\$0
D	11111	SY	0.00	0	21.49			\$0				\$0
D	11111	SY	0.00	0	21.49			\$0				\$0
D	11111	SY	0.00	0	21.49			\$0				\$0
D	1	lot	0.00	0	21.49			\$0				\$0
D	17	ea	0.00	0	21.49			\$0				\$0
D	40	lf	0.00	0	21.49			\$0				\$0
D	2	ea	0.00	0	21.49			\$0				\$0
D	10	ea	0.00	0	21.49			\$0				\$0
D	50	lf	0.00	0	21.49			\$0				\$0
D	4	ea	0.00	0	21.49			\$0				\$0
D	3.67	acre	0.00	0	21.49			\$0				\$0
D	17778	SY	0.00	0	21.49			\$0				\$0
D	17778	SY	0.00	0	21.49			\$0				\$0
D	17778	SY	0.00	0	21.49			\$0				\$0
D	17778	SY	0.00	0	21.49			\$0				\$0
D	17778	SY	0.00	0	21.49			\$0				\$0
D	7111	SY	0.00	0	21.49			\$0				\$0
D	7112	SY	0.00	0	21.49			\$0				\$0
D	2000	lf	0.00	0	21.49			\$0				\$0
D	4000	lf	0.00	0	21.49			\$0				\$0
D	16	ea	0	0	21.49			\$0				\$0
D	10	ea	0.00	0	21.49			\$0				\$0
D	1	ea	0.00	0	21.49			\$0				\$0
D	1	lot	0.00	0	21.49			\$0				\$0
D	222	SY	0.000	0	21.49			\$0				\$0
D	1260	SF	0.00	4	21.49			\$80				\$80
D	6	ea	2.00	17	21.49			\$360				\$360
D	40	loads	0.800	45	21.49			\$960				\$960
D	Subtotal Direct Cost											\$1,400
D												\$0
D												\$1,400

CONTRACTOR - Stated in FY01 DOLLARS

DETAIL ESTIMATE WORKSHEETS

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)
 ESTIMATE NO.: C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HSTAR

FLUOR FERNALD

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL		
			Unit	Total		Labor	S/C	Mat'l						Equip	
D	3	ea	20.00	84	21.49										
D	1	ea	20.00	28	23.60			\$1,800 \$660					\$1,800		
D															
D															
D															
D															
D															
D															
Subtotal Direct Cost											\$2,500	\$0	\$0	\$0	\$2,500
Subtotal Indirect Cost															
Grand Total											\$2,500	\$0	\$0	\$0	\$2,500

APPENDIX "A"

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)		DATE: 16-May-01										
ESTIMATE NC C4.01.05.006		ESTIMATOR: Johnson										
CLIENT: DOE		LOCATION: Fernald										
WBS NO.: 1.1.H.D		TASK NO.: HS1AR										
EFFICIENCY / MULTIPLIER ANALYSIS		SITE SPECIFIC										
PERCENT OF INFLUENCE ON CHART MANHOURS		EFFICIENCY / MULTIPLIER ANALYSIS										
	40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR	POOR		FAIR			STD	V.GOOD	EXCELLEN	100.0%	12.0%	0.12
CRAFT AVAIL.(NOTE 1)		POOR		FAIR			STD			100.0%	8.0%	0.08
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW			RAIN		+40 TO +85			70.0%	20.0%	0.14
PLANT ELEVATION		OVER 10,000FT			5,000' TO 10,000 FT		UNDER 5,000 FT			100.0%	10.0%	0.1
WORK SPACE				200 SF	250 SF	300 SF	350 SF			80.0%	10.0%	0.08
WORK WEEK							4-10s / 5-8s			100.0%	10.0%	0.1
60 HOUR WORK WEEK							UP TO 3 WEEKS			0.0%	0.0%	0
60 HOUR WORK WEEK							UP TO 3 WEEKS			0.0%	0.0%	0
SHIFTWORK 2ND SHIFT 3RD SHIFT							OR ONE SHIFT ONLY			100.0%	3.0%	0.03
PROJECT SIZE										100.0%	5.0%	0.05
PLANT TYPE										100.0%	4.0%	0.04
AREA/UNION INFLUENCE	STRONG		MILD		SOME		NONE			40.0%	10.0%	0.04
NOTES.....	1. TURNOVER HAS BEEN CONSIDERED 2. FOR EXTERIOR WORK ONLY											
	EFFICIENCY (AS A % OFF CHART MANHOURS)										100.0%	83.6%
	MULTIPLIER - (TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S)											
	1.20											

EFFICIENCY FACTORS

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)
 ESTIMATE NO. C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR



EXAMPLE:

STANDARD CHART MANHOURS = NET 100
 EFFICIENCY FACTORS:
 * SITE SPECIFIC (SEE APPENDIX A) 20.0
 S/T = BASE UNIT MANHOURS 120

OVERTIME PRODUCTIVITY FACTOR 0.00% 0
 (SEE DETAIL WORKSHEET BACK-UP) 120

* TASK SPECIFIC (confined space, high elevation, congestion, etc.) 0.0% 0
 120

* PPE SPECIFIC (Based on current data and estimating knowledge)

	PPE LEVEL									
	D		Mod.'D'		Mod. "C"		C		C+	
PRODUCTIVITY HOURS	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	
(AS A %) / ADD MH's	10.00%	12	71.00%	85	79.00%	95	74.00%	89	96.00%	115
(AS A MULTIPLIER)/TOTAL HRs	10.00	1.32	1.71	205.2	1.79	214.8	1.74	208.8	1.96	235.2
TOTAL MULTIPLIER w/SITE PROD.	1.32		205.2		214.8		2.088		2.352	

NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)

Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's.
 (SEE APPENDIX C - HEALTH PHYSICS)

0.0	Man Days	21.0	Man Days	21.0	Man Days	21.0	Man Days	24.0	Man Days
-----	----------	------	----------	------	----------	------	----------	------	----------

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

APPENDIX "B"

EFFICIENCY FACTORS

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)
 ESTIMATE NO. C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE MULTIPLIER DEVELOPEMENT

		D	mD	mC	C	C+
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	0
	TOTAL CREW	7	7	7	7	7
CREW SIZE RATIO		1.00	1.00	1.00	1.00	1.00
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68
PPE LABOR PRODUCTIVITY FACTOR		1	1	0.86	0.82	0.75
NET PRODUCTIVITY RATIO		0.96	0.78	0.602	0.574	0.51
NET PRODUCTIVITY MULTIPLIER		1.04	1.28	1.66	1.74	1.96

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mD	mC	C	C+
TOTAL WORK MINUTES per L	4 - 10's	600	600	600	600	600
ADDITN'L SITE SAFETY MEETINGS NOT INCLD. IN BAS	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	0	3	3	3
	MINUTES	0	0	15	15	20
TOTAL			0	45	45	60
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	2
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	30
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS) 33.33%	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	20	20
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	N/A	N/A
	MINUTES	N/A	N/A	N/A	N/A	N/A
TOTAL						
AVAILABLE WORK TIME		575	465	420	420	405
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)
 ESTIMATE NO. C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

FLUOR FERNALD

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY			
			Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)			
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		\$'s	*	MAN DAYS	MAT'L.\$'s	PPE LEVEL
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	0	\$0	C / C+
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	0	\$0	C / C+
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	C / C+
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	C / C+
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	C / C+
APR CARTRIDGES - DISPOSABLE	PR	6.98	3	0	\$0	C / C+
SUB-TOTAL		17.42	3		\$0	

(DOUBLE PPE)

\$/MD = \$0.00

PPE LEVEL mC						
DESCRIPTION	UNIT	\$'s		MAN DAYS	MAT'L.\$'s	PPE LEVEL
FULL DRESS w/ FACE SHIELD						
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIE	PR	4.46	3	0	\$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	mC
SUB-TOTAL		5.98	3		\$0	

\$/MD = \$0.00

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY.	NO. OF		
			PER WKR.	WORKERS		
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	\$0	D/C/B
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	\$0	C
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	\$0	C
SCBA	EA	1894.00	2	0	\$0	B
COOL VESTS	EA	137.50	6	0	\$0	C/B
THERMO STRIPS	EA	50.00	6	0	\$0	C/B
SUB-TOTAL					\$0	

MAT'L.\$'s
\$0

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF F FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)
 ESTIMATE NO. C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

-MEDICAL MONITORING -

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	12	48	\$22.48	\$1,080
ANNUAL PHYSICALS	0	4	12	0	\$22.48	\$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	12	12	\$22.48	\$270
SUB-TOTAL						\$1,350

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	4	1	12	44	\$22.48	\$1,000
SUB-TOTAL						\$1,000

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR \$'s	
	0	2	0	\$22.48	\$0	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.0042735	2	0.0085	0

LABOR \$'s THRU SAFETY LABOR \$'s

WORK DELAYS CAUSED BY MONITORING 0.0% \$45,800 \$0

LABOR \$'s

WORK DELAYS CAUSED BY RAD CHECKING 0.0% \$45,800 \$0

TOTAL LABOR TOTAL MAT'L GRAND TOTAL

TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET \$2,400 \$0 \$2,400

ACTIVITY DURATIONS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking (Demolition)
 ESTIMATE NO.: C4.01.05.006
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	03-May-01	15-May-05	04-Sep-05	26-Dec-05		7.4 MONTHS
						0 MONTHS
TOTAL						7.4 MONTHS

DATE of EST. to MID-POINT	
ACTIVITY DURATION	
a.	52.2 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS						0 MONTHS

DATE of EST. to MID-POINT	
ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

Memorandum

To:	Jeff Stone, MS52-4	Date:	May 17, 2001
Location:	Fernald	Reference:	N/A
From:	 Ken Kepler, MS80-3	Fernald #:	M:OOTP(PC/EST):2001-0074
Location:	Springdale	Client:	DOE DE-AC24-01OH20115
Extension:	648-6767	Subject:	SILOS 1&2 HAUL ROAD & PARKING

c: File Record Subject ESTIMATE C4-2001-05-005
Dennis Nixon, MS52-4

Attached are two (2) copies for the SILOS 1&2 HAUL ROAD & PARKING.

To request any additional copies of this estimate or for any questions, please contact Roger Johnson on extension 4140.

KGK:RLJ:hmp
Attachment

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.005

BASIS OF ESTIMATE

SUPPORTING DOCUMENTATION:

Verbal Scope	<input type="checkbox"/>	P & ID's	<input type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input type="checkbox"/>	Equipment List	<input type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input checked="" type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input type="checkbox"/>	Written Scope	<input type="checkbox"/>	Prev. Estimates	<input type="checkbox"/>

TYPE OF ESTIMATE:

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

BASIS OF ESTIMATE:

The purpose of estimate C4.01.05.005 is to provide a cost for the construction to resurface the existing asphalt portion of the haul road south of the silo area. Construct a 100,000 SF truck trailer parking area by cutting and chipping the trees that now exist in the area. The truck trailer park will be covered with 12" of crushed rock. Install lighting around this parking lot. Construct a new heavy-duty haul road from the end of the asphalt road out to Willey Road. This haul road will have a crushed surface. Purchase and install three (3) trailers, two (2) along the road and one (1) in the new truck parking lot. Supply electrical power to all three (3) trailers Relocate the RIMIA truck scale, from its current location, and install the scale in its new concrete pit. Install a new gate on the new heavy haul road, just off Willey Road. All costs are in 2001 dollars.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.005

ESTIMATE ASSUMPTIONS

EXECUTION:

- This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- This project is to be performed on a 40-hour week, 10 hours a day.
- Premium time allowed in addition to contractual 50-hour weeks.

WAGE RATES:

- Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

ENGINEERING:

- N/A
- Engineering dollars provided by the Project Engineer.
- Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

CONSTRUCTION MANAGEMENT:

- N/A
- Construction Management dollars provided by the Project Engineer.
- Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROJECT MANAGEMENT:

- N/A
- Project Management dollars provided by the Project Engineer.
- Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

PROGRAM MANAGEMENT:

- Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- Waste Program Management dollars provided by the Project Engineer.

WASTE

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.005

PRODUCTIVITY:

See appendix "B" for productivity factors

ESCALATION:

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

UNIT RATES:

Labor rates are the crew rates based on the current site labor rates.

G & A (HO EXPENSE

This expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

HEALTH PHYSICS:

It was assumed that this will be a clean area and no PPE requirements were considered

RISK BUDGET:

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will done for this estimate.

CONTINGENCY:

N/A.

**FLUOR FERNALD
PROJECTS CONTROLS
ESTIMATING SERVICES**

May 16, 2001

PROJECT DESCRIPTION: Silo 1 & 2 Haul Road & Parking

WBS:1.1.H.D

PROJECT ENGINEER: Jeff Stone

ESTIMATOR: R Johnson

ESTIMATE NUMBER: C4.01.05.005

ESTIMATE INCLUSIONS & EXCLUSIONS

INCLUSIONS:

- The supplied Sketch was the primary source for the estimate
- Material pricing was from Mean's and a previous estimate
- Unit man-hours were from Mean's and a previous estimate.
- The equipment list was provided by the project.
- All labor ,material and equipment costs are in 2001 dollars.
- Utilities to this facility will be from near by sources.

EXCLUSIONS:

- Permits and fees.
- FFS G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
- D & D costs for the new construction
- No breakdown by subcontractors installation costs,material costs and equipment costs was considered..

ESTIMATE SUMMARY SHEET

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE #: C4-2001-05-005
 CLIENT: DOE
 WBS #: 1.1.H.D

FLUOR FERNALD

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
Mobilization/Demobilization	500		\$11,300				\$11,300
Site Work	4,772		\$102,600		\$203,100		\$305,700
Concrete	2,461		\$55,200		\$36,200		\$91,400
Equipment	482		\$11,000		\$64,000		\$75,000
Electrical	877		\$19,900		\$35,200		\$55,100
DIRECT FIELD COSTS TOTAL							
	9,092	\$22.00	\$200,000		\$338,500		\$538,500
SUPERVISION - CONTRACTOR	2,000		\$44,000				\$44,000
SMALL TOOLS & CONSUMABLES	-	-	-		\$16,000		\$16,000
MISC. EQUIP. RENTAL	-	-	-			\$409,100	\$409,100
TEMPORARY FACILITIES	364		\$8,000		\$8,000		\$16,000
TEMPORARY UTILITY HOOK-UP	295		\$6,500		\$3,500		\$10,000
JOB CLEAN-UP	546		\$12,000		\$4,000		\$16,000
PER DIEM / SUBSISTANCE	-	-	-				
HEALTH PHYSICS S/C	105		\$2,300				\$2,300
CERCLA - TRAINING	300		\$6,600				\$6,600
GET/SITE ACCESS & JOB SPECIFIC TRAINING	216		\$4,800				\$4,800
PAYROLL BURDENS & BENEFITS	-	-	\$162,000				\$162,000
OVERHEAD & PROFIT	-	-	-	\$245,100			\$245,100
BOND	-	-	-	\$19,100			\$19,100
SALES TAX	-	-	-		\$22,200	\$24,500	\$46,700
INDIRECT FIELD COSTS TOTAL							
	3,825		\$246,200	\$264,200	\$53,700	\$433,600	\$997,700
DIRECT & INDIRECT FIELD COSTS TOTAL							
	12,917	\$34.54	\$446,200	\$264,200	\$392,200	\$433,600	\$1,536,200
TARGET ESTIMATE (FY 01 DOLLARS)							\$1,536,200

ESTIMATE PERFORMED BY ESTIMATING SERVICES

ESTIMATE SUMMARY SHEET

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO.: C4-2001-05-005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

FACTORS

FIXED PRICE \$	LABOR \$	S/C \$	MAT'L. \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$200,000		\$338,500			\$538,500
IFC COST FACTOR	3.2480		1.7346	#DIV/0!	-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2077	1.2077	1.2077	1.2077	1.2077	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	3.9226	1.2077	2.2206	1.2802	1.2802	
BASE ESTIMATE \$'s	\$784,525		\$751,665			\$1,536,190
BASE FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	3.9226	1.2077	2.2206	1.2802	1.2802	
FPS TARGET ESTIMATE (FY01 \$)	\$784,525		\$751,665			\$1,536,190

NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY01 for input to microframe. SEE De-Escalated Summary....N/A
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G62.

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO.: C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	SUMMARY	QTY	UNIT	MAN-HOURS			COST / UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL					
				Unit	Total	Rate	Labor	S/C	Mat'l						Equip				
	Mobilization/Demobilization				500				\$11,300				\$11,300						
	Site Work				4,772				\$102,600		\$203,100		\$305,700						
	Concrete				2,461				\$55,200		\$36,200		\$91,400						
	Equipment				482				\$11,000		\$64,000		\$75,000						
	Electrical				877				\$19,900		\$35,200		\$55,100						
Subtotal Direct Cost													\$200,000		\$338,600		\$0	\$538,600	

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO.: C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Rate	Total	Labor	SIC	Mat'l					
D	1585	cy	0.11	21.49	244			\$5,230				\$5,230	
D	610	cy	0.15	21.49	128			\$2,750				\$2,750	
D	1015	cy	0.10	142	142			\$3,050				\$3,050	
D	2.3	acre	160.00	21.49	514			\$11,050				\$11,050	
D	2.3	acre	48.00	21.49	154			\$3,310				\$3,310	
D	3.3	acre	40.00	21.49	184			\$3,960		\$160		\$4,120	
D	11111	sy	0.01	78	78		\$45	\$1,670				\$1,670	
D	11111	sy	0.01	124	124			\$2,670				\$2,670	
D	11111	sy	0.01	140	140			\$3,000				\$3,000	
D	11111	sy	0.02	264	264			\$5,670		\$60,780		\$66,450	
D	1	lot	150.00	21.49	210		\$5.00	\$4,500				\$4,500	
D	11111	sy	0.01	124	124			\$2,670				\$2,670	
D	17	ea	5.60	21.49	133			\$2,860		\$0		\$2,860	
D	40	lf	0.75	21.49	42		106.00	\$900		\$4,640		\$5,540	
D	2	ea	9.33	21.49	26		1137.00	\$560		\$2,480		\$3,050	
D	10	ea	0.50	7	7		16.00	\$150		\$600		\$750	
D	50	lf	0.05	21.49	3		11.00	\$80		\$200		\$280	
D	4	ea	0.64	21.49	4		45.00	\$80		\$160		\$240	
D	3.67	acre	40.00	21.49	205		45.00	\$4,410				\$4,590	
D	17778	sy	0.01	124	124			\$2,670				\$2,670	
D	17778	sy	0.01	199	199			\$4,270				\$4,270	
D	17778	sy	0.01	124	124			\$2,670				\$2,670	
D	17778	sy	0.02	422	422			\$9,070		\$72,930		\$82,000	
D	17778	sy	0.01	199	199			\$4,270				\$4,270	
D	7111	sy	0.03	248	248		3.75	\$5,340		\$50,640		\$55,980	
D	7112	sy	0.01	50	50		6.51	\$1,070		\$5,060		\$6,130	
D	2000	lf	0.01	14	14		0.65	\$300		\$220		\$520	
D	4000	lf	0.02	84	84		0.10	\$1,800		\$790		\$2,590	
D	16	ea	1	29	29		45.00	\$620				\$1,800	
D	10	ea	3.50	49	49			\$1,050				\$1,050	
D	1	ea	22.00	31	31		935.00	\$660		\$1,020		\$1,680	
D	1	lot	200.00	279	279			\$6,000				\$6,000	
D	222	sy	0.110	34	34		2.50	\$730		\$610		\$1,340	
D	1260	sf	0.02	35	35		1.20	\$760		\$1,650		\$2,410	
D	6	ea	15.00	126	126		150.00	\$2,700		\$980		\$3,680	
									\$102,550	\$0	\$203,130	\$0	\$305,680
									4772				

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO.: C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL		
			Unit	Total	Rate	Labor	S/C	Mat'l						Equip	
D	12	ea	2.00	34	22.43			\$750		\$720		\$1,470			
D	4	ea	3.70	21	22.43			\$460		\$380		\$840			
D	115	cy	3.70	594	22.43			\$13,330		\$10,820		\$24,150			
D	75	cy	12.20	1278	22.43			\$28,670		\$14,770		\$43,440			
D	25	cy	5.10	178	22.43			\$4,000		\$3,230		\$7,230			
D	75	cy	3.40	356	22.43			\$7,990		\$6,240		\$14,230			
D															
D															
D															
D															
D															
											\$55,200	\$0	\$36,200	\$0	\$91,400
Subtotal Direct Cost											\$55,200	\$0	\$36,200	\$0	\$91,400

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO.: C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS			Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL			
			Unit	Total			Labor	S/C	Mat'l						Equip		
D	3	ea	40.00	168	21.49				\$3,600		\$64,000		\$67,600				
D	1	ea	225.00	314	23.60				\$7,420								
D																	
D																	
D																	
D																	
D																	
Subtotal Direct Cost													\$11,000	\$0	\$64,000	\$0	\$75,000
Subtotal Indirect Cost													\$0	\$0	\$0	\$0	\$0

DETAIL ESTIMATE WORKSHEETS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO.: C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ITEM NO.	QTY	UNIT	MAN-HOURS		Rate	COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL			
			Unit	Total		Labor	S/C	Mat'l						Equip		
D	12	ea	9.00	151	22.66								\$11,700			
D	5	ea	8.00	56	22.66	690.00		\$3,420		\$8,280			\$11,700			
D	500	lf	0.07	45	22.66	265.00		\$1,270		\$1,325			\$2,595			
D	4	ea	22.00	123	22.66	2.17		\$1,030		\$1,065			\$2,115			
D	4	ea	3.00	17	22.66	2750		\$2,790		\$11,000			\$13,790			
D	4	ea	2.00	11	22.66	455.00		\$380		\$1,820			\$2,200			
D	1500	lf	0.08	157	22.66	75.00		\$250		\$300			\$550			
D	1400	lf	0.04	82	22.66	5.65		\$3,560		\$8,475			\$12,035			
D	4200	lf	0.027	158	22.66	0.26		\$1,860		\$364			\$2,224			
D	84	ea	0.16	19	22.66	0.37		\$3,590		\$1,554			\$5,144			
D	1	lot	41	57	22.66	0.65		\$430		\$55			\$485			
D					22.66	929		\$1,300		\$929			\$2,229			
Subtotal Direct Cost												19,900	0	35,200	0	\$55,100

EFFICIENCY FACTORS

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO. C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR



EXAMPLE:

STANDARD CHART MANHOURS =	NET	100
EFFICIENCY FACTORS:		
* SITE SPECIFIC (SEE APPENDIX A)	15%	15.0
S/T = BASE UNIT MANHOURS		115
OVERTIME PRODUCTIVITY FACTOR (SEE DETAIL WORKSHEET BACK-UP)	0.00%	0
		115
* TASK SPECIFIC (confined space, high elevation, congestion, etc.)	0.0%	0
		115
* PPE SPECIFIC (Based on current data and estimating knowledge)		

	PPE LEVEL									
	D		Mod. 'D'		Mod. "C"		C		C+	
PRODUCTIVITY HOURS (AS A %) / ADD MH's	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER
(AS A MULTIPLIER)/TOTAL HR's	10.00%	12	71.00%	82	79.00%	91	74.00%	85	96.00%	110
TOTAL MULTIPLIER w/SITE PROD.	1.265	1.265	1.71	196.7	1.79	205.9	1.74	200.1	1.96	225.4
<p>NOTE : Use the Default Productivity Factor of 'mC' for working in a contaminated area if the Safety Level cannot be determined. (SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6006 8.10)</p> <p>Total hours worked in a specific PPE level divided by 10 hour working days = (PPE) ManDays to determine material cost of PPE's. (SEE APPENDIX C - HEALTH PHYSICS)</p>										
	0.0	Man Days	20.0	Man Days	21.0	Man Days	20.0	Man Days	23.0	Man Days

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL, TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN HANDLING CONTAMINATED AND HAZARDOUS WASTE.

APPENDIX "B"

EFFICIENCY FACTORS

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO. C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

PPE MULTIPLIER DEVELOPEMENT

	D	mD	mC	C	C+
CREW SIZE & MAKE-UP					
STANDARD	7	7	7	7	7
WORKER-BUDDY	0	0	0	0	0
SUPPORT TEAM	0	0	0	0	0
TOTAL CREW	7	7	7	7	7
CREW SIZE RATIO	1.00	1.00	1.00	1.00	1.00
AVAILABLE WORK TIME FACTOR	0.96	0.78	0.7	0.7	0.68
PPE LABOR PRODUCTIVITY FACTOR	1	1	0.86	0.82	0.75
NET PRODUCTIVITY RATIO	0.96	0.78	0.602	0.574	0.51
NET PRODUCTIVITY MULTIPLIER	1.04	1.28	1.66	1.74	1.96

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mD	mC	C	C+
TOTAL WORK MINUTES per [4 - 10's		600	600	600	600	600
ADDITN'L SITE SAFETY MEETINGS NOT INCLD. IN BAS	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	0	3	3	3
	MINUTES	0	0	15	15	20
TOTAL			0	45	45	60
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	2
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	30
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** (4 OUT OF 12 MONTHS) 33.33%	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	20	20
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	N/A	N/A
	MINUTES	N/A	N/A	N/A	N/A	N/A
TOTAL						
AVAILABLE WORK TIME		575	465	420	420	405
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

** Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO. C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

FLUOR FERNALD

PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY																																																											
			Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)																																																											
		\$'s		MAN DAYS	MAT'L.\$'s	PPE LEVEL																																																								
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.			*																																																											
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	0	\$0	C / C+																																																								
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	0	\$0	C / C+																																																								
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	C / C+																																																								
GLOVE. LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	C / C+																																																								
GLOVE. WORK - DISPOSABLE	PR	1.02	3	0	\$0	C / C+																																																								
APR CARTRIDGES - DISPOSABLE	PR	6.98	3	0	\$0	C / C+																																																								
SUB-TOTAL		17.42	3		\$0																																																									
					\$/MD =	\$0.00																																																								
PPE LEVEL mC																																																														
FULL DRESS w/ FACE SHIELD		\$'s		MAN DAYS	MAT'L.\$'s	PPE LEVEL																																																								
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIE	PR	4.46	3	0	\$0	mC																																																								
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	mC																																																								
GLOVE. LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	mC																																																								
GLOVE. WORK - DISPOSABLE	PR	1.02	3	0	\$0	mC																																																								
SUB-TOTAL		5.98	3		\$0																																																									
					\$/MD =	\$0.00																																																								
<table border="1"> <thead> <tr> <th>SUBCONTRACTOR REQUIRED PURCHASES</th> <th>UNIT</th> <th></th> <th>QTY. PER WKR.</th> <th>NO. OF WORKERS</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>RUBBER BOOT COVERS-(1)PR.PER WORKER</td> <td>PR</td> <td>12.70</td> <td>6</td> <td>0</td> <td>\$0</td> <td>D/C/B</td> </tr> <tr> <td>APR w/HALF FACE MASK - (1) PER WORKER</td> <td>EA</td> <td>22.30</td> <td>6</td> <td>0</td> <td>\$0</td> <td>C</td> </tr> <tr> <td>APR w/FULL FACE MASK - (1) PER WORKER</td> <td>EA</td> <td>174.00</td> <td>6</td> <td>0</td> <td>\$0</td> <td>C</td> </tr> <tr> <td>SCBA</td> <td>EA</td> <td>1894.00</td> <td>2</td> <td>0</td> <td>\$0</td> <td>B</td> </tr> <tr> <td>COOL VESTS</td> <td>EA</td> <td>137.50</td> <td>6</td> <td>0</td> <td>\$0</td> <td>C/B</td> </tr> <tr> <td>THERMO STRIPS</td> <td>EA</td> <td>50.00</td> <td>6</td> <td>0</td> <td>\$0</td> <td>C/B</td> </tr> <tr> <td>SUB-TOTAL</td> <td></td> <td></td> <td></td> <td></td> <td>\$0</td> <td></td> </tr> </tbody> </table>							SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS			RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	\$0	D/C/B	APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	\$0	C	APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	\$0	C	SCBA	EA	1894.00	2	0	\$0	B	COOL VESTS	EA	137.50	6	0	\$0	C/B	THERMO STRIPS	EA	50.00	6	0	\$0	C/B	SUB-TOTAL					\$0	
SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY. PER WKR.	NO. OF WORKERS																																																										
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SUB-TOTAL					\$0																																																									
					MAT'L.\$'s	\$0																																																								

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

APPENDIX "C"

HEALTH PHYSICS

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO. C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

-MEDICAL MONITORING -

MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	12	48	\$22.00	\$1,060
ANNUAL PHYSICALS	0	4	12	0	\$22.00	\$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	12	12	\$22.00	\$260
SUB-TOTAL						\$1,320

RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	4	1	12	44	\$22.00	\$980
SUB-TOTAL						\$980

RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR \$'s	
	0	2	0	\$22.00	\$0	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.0042735	12	0.0513	0

LABOR \$'s THRU SAFETY	LABOR \$'s
------------------------	------------

WORK DELAYS CAUSED BY MONITORING	0.0%	\$270,500	\$0
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LABOR \$'s

WORK DELAYS CAUSED BY RAD CHECKING	0.0%	\$270,500	\$0
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TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
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TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	\$2,300	\$0	\$2,300
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ACTIVITY DURATIONS

FLUOR FERNALD

PROJECT: Silo 1 & 2 Haul Road & Parking
 ESTIMATE NO. C4.01.05.005
 CLIENT: DOE
 WBS NO.: 1.1.H.D

DATE: 16-May-01
 ESTIMATOR: Johnson
 LOCATION: Fernald
 TASK NO.: HS1AR

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	03-May-01	15-May-02	04-Sep-02	26-Dec-02		7.4 MONTHS
						0 MONTHS
TOTAL						7.4 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
a.	16.1 MONTHS
b.	0 MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS						0 MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION	
	0 MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.

HS1AT

TRANSPORTATION CONTRACT

Fluor Fernald, Inc.

PBS: OHFN07
 WBS: 1.1.H.D
 CTRL ACCT: HS1A
 CHARGE NO: HS1AT
 TRANSPORTATION CONTRACT
 COMMENT#:
 Resource: FIELD SUBS
 Res Dept: 943
 Class: FIELD SUBS
 EOC: SUB
 Overtime:
 (1 FTE EQUALS 1747 HOURS)
 ESTIMATE SUPPORT WORKSHEET
 FOR ACTIVITY BASED ESTIMATING
 DATE: 09/05/01
 PROJECT MGR: R. FELLMAN
 CAM: R. FELLMAN
 PREPARED BY: J. NORTH
 FISCAL YEAR: 2001-2008

Resource:	ODC700	ODC 700	Class:	EOC:	ODC	Subcontractors
Res Dept:	943	OverTime:	Class:	EOC:	ODC	
Yr Units:	0.0	0.0				
Cum Units:	0.0	0.0				
Yr Total Cost:	0	0				
Cum Total Cost:	0	0				

Resource:	ODC700	ODC 700	Class:	EOC:	ODC	Subcontractors
Res Dept:	943	OverTime:	Class:	EOC:	ODC	
Yr Units:	0.0	0.0				
Cum Units:	0.0	0.0				
Yr Total Cost:	0	0				
Cum Total Cost:	0	0				

Resource:	ODC700	ODC 700	Class:	EOC:	ODC	Subcontractors
Res Dept:	943	OverTime:	Class:	EOC:	ODC	
Yr Units:	0.0	0.0				
Cum Units:	0.0	0.0				
Yr Total Cost:	0	0				
Cum Total Cost:	0	0				

CAM: *Robert Fellman*
 CONTROL TEAM: *Theresa P. ...*

HS1AU

CONTAINER CONTRACT

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AU
COMMENT#: CONTAINER CONTRACT

Resource: FIELD SUBS
Res Dept: 943
FIELD SUBS
Overtime:

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Units:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Units:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yr Total Cost:	0	0	0	0	0	0	4,471,080.0	4,471,080.0	11,766,000.0	16,237,080.0	27,956,016.0	29,415,000.0	29,415,000.0	1,458,984.0	29,415,000.0	29,415,000.0	29,415,000.0	29,415,000.0	29,415,000.0	29,415,000.0
Cum Total Cost:	0	0	0	0	0	0	4,471,080.0	4,471,080.0	16,237,080.0	27,956,016.0	31,403,418.0	33,125,320.0	33,125,320.0	33,125,320.0	33,125,320.0	33,125,320.0	33,125,320.0	33,125,320.0	33,125,320.0	33,125,320.0

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost	Yr	Total Cost
Yr Total Cost:	0	0	0	0	0	0	4,847,819	4,847,819	13,114,627	17,962,447	31,403,418	33,125,320	33,125,320	1,721,902	33,125,320	33,125,320	33,125,320	33,125,320	33,125,320	33,125,320
Cum Total Cost:	0	0	0	0	0	0	4,847,819	4,847,819	13,114,627	17,962,447	31,403,418	33,125,320	33,125,320	33,125,320	33,125,320	33,125,320	33,125,320	33,125,320	33,125,320	33,125,320

GRAND TOTALS:

CAM: Robert Fellman

CONTROL TEAM: *[Signature]*

HS1AV

PRELIMINARY DESIGN – FLUOR FERNALD

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY-BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 111HD
CTRL ACCT: HS1A
CHARGE NO: HS1AV PRELIMINARY DESIGN- FFI
COMMENT#: F07-001, F07-035, F07-061

Resource:	ENGCVL	ENGINEER CIVIL	Class:	EOC:	LABOR
Res Dept:	943	Overtime:		SAL	
Yr Hours:	0	0	0	0	0
Cum Hours:	0	0	0	0	0
Yr Total Cost:	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0

Resource:	ENGINR	ENGINEER	Class:	EOC:	LABOR
Res Dept:	943	Overtime:		SAL	
Yr Hours:	59.8	59.8	59.8	158.8	158.8
Cum Hours:	59.8	1,903.1	1,903.1	158.8	158.8
Yr Total Cost:	4,112	133,407	133,407	9,092	158.8
Cum Total Cost:	4,112	137,519	137,519	9,092	158.8

Resource:	ENGPRC	ENG PROCESS/STARTUP	Class:	EOC:	LABOR
Res Dept:	943	Overtime:		SAL	
Yr Hours:	29.9	29.9	29.9	0.0	0.0
Cum Hours:	29.9	1,674	1,674	0.0	0.0
Yr Total Cost:	1,674	28,395	28,395	0.0	0.0
Cum Total Cost:	1,674	30,069	30,069	0.0	0.0

Resource:	MAT300	MATERIAL OBJCLASS300	Class:	EOC:	MATERIAL
Res Dept:	943	Overtime:		MAT	
Yr Units:	266.6	266.6	266.6	449.2	449.2
Cum Units:	266.6	1,974.9	1,974.9	3,500.0	3,500.0
Yr Total Cost:	267	1,754	1,754	487	487
Cum Total Cost:	267	2,021	2,021	3,643	3,643

Resource:	ODCTRL	TRAVEL RESOURCE	Class:	EOC:	ODC
Res Dept:	943	Overtime:		ODC	
Yr Units:	0	0	0	0	0
Cum Units:	0	0	0	0	0
Yr Total Cost:	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AV PRELIMINARY DESIGN- FFI
COMMENT#: F07-001, F07-035, F07-061

Yr Units:	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
31,207.5	31,207.5	127,049.9	11,677.6	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0	169,935.0
31,207.5	31,207.5	158,257.4	12,317	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31,207	31,207	130,480	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004
Cum Total Cost	31,207	161,688	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004	174,004

Resource:	Res Dept:	SERVSUB	Overtime:	SUBS	Class:	EOC:		SUBCONTRACTORS	
						TP	SUB	TP	SUB
943	943								
Yr Units:									
Cum Units:									
Yr Total Cost:									
Cum Total Cost:									

Resource:	Res Dept:	TPHO	Overtime:	TEAM PARTNER HOME OF	Class:	EOC:		LABOR	
						TP	SUB	TP	SUB
943	943								
Yr Hours:									
Cum Hours:									
Yr Total Cost:									
Cum Total Cost:									

Resource:	Res Dept:	TPSREP	Overtime:	TECH/PROG SUPT REP	Class:	EOC:		LABOR	
						TP	SUB	TP	SUB
943	943								
Yr Hours:									
Cum Hours:									
Yr Total Cost:									
Cum Total Cost:									

Resource:	Res Dept:	WSTENG	Overtime:	WASTE ENGINEER	Class:	EOC:		LABOR	
						TP	SUB	TP	SUB
943	943								
Yr Hours:									
Cum Hours:									
Yr Total Cost:									
Cum Total Cost:									

HS1AW

PRELIMINARY DESIGN - JACOBS

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.H.D
CTRL ACCT: HS1A
CHARGE NO: HS1AW PRELIMINARY DESIGN - HACOBBS
COMMENT#: F07-001, F07-035, F07-061

Resource: SERVSUB SUBS OverTime: JEG Class: EOC: SUB
Res Dept: 943

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Units:	783,120.0	3,235,489.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	783,120.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0	4,018,609.0
Yr Total Cost:	783,120	3,322,847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	783,120	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967

GRAND TOTALS:

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-		
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 11	Sep 12	Sep 13	Sep 14	Sep 15	Sep 16	Sep 17	Sep 18	Sep 19	Sep 20	
Yr Total Cost:	783,120	3,322,847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	783,120	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967	4,105,967

CAM: Robert Fellman CONTROL TEAM: [Signature]

HS1AX

FINAL DESIGN – FLUOR FERNALD

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07

WBS: 1.1.H.D

CTRL ACCT: HS1A

CHARGE NO: HS1AX FINAL DESIGN - FFI

COMMENT# F07-001, F07-035, F07-061

Resource: ENGCVL ENGINEER CIVIL
Res Dept: 943 Overtime:

	Class:		EOC:		SAL		LABOR	
	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-
Yr Hours:	0.0	89.0	200.1	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	89.0	289.1	289.1	289.1	289.1	289.1	289.1
Yr Total Cost:	0	5,094	12,132	0	0	0	0	0
Cum Total Cost:	0	5,094	17,226	17,226	17,226	17,226	17,226	17,226

Resource: ENGINEER
Res Dept: 943 Overtime:

	Class:		EOC:		SAL		LABOR	
	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-
Yr Hours:	0.0	1,332.0	4,738.7	4,738.7	4,738.7	4,738.7	4,738.7	4,738.7
Cum Hours:	0.0	1,332.0	3,406.7	4,738.7	4,738.7	4,738.7	4,738.7	4,738.7
Yr Total Cost:	0	96,404	261,158	0	0	0	0	0
Cum Total Cost:	0	96,404	357,562	357,562	357,562	357,562	357,562	357,562

Resource: ENGPCR
Res Dept: 943 Overtime:

	Class:		EOC:		SAL		LABOR	
	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-
Yr Hours:	0.0	266.4	807.2	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	266.4	1,073.6	1,073.6	1,073.6	1,073.6	1,073.6	1,073.6
Yr Total Cost:	0	15,697	50,379	0	0	0	0	0
Cum Total Cost:	0	15,697	66,076	66,076	66,076	66,076	66,076	66,076

Resource: MAT300
Res Dept: 943 Overtime:

	Class:		EOC:		MAT		MATERIAL	
	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-
Yr Units:	0.0	0.0	300.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	300.0	300.0	300.0	300.0	300.0	300.0
Yr Total Cost:	0	0	316	0	0	0	0	0
Cum Total Cost:	0	0	316	316	316	316	316	316

Resource: ODCTRVL
Res Dept: 943 Overtime:

	Class:		EOC:		ODC		ODC	
	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-
Yr Units:	0.0	25,650.0	71,040.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	25,650.0	96,690.0	96,690.0	96,690.0	96,690.0	96,690.0	96,690.0
Yr Total Cost:	0	26,343	74,928	0	0	0	0	0
Cum Total Cost:	0	26,343	101,270	101,270	101,270	101,270	101,270	101,270

Fluor Fernald, Inc.

DATE 09/05/01
PROJECT MGR R FELLMAN
CAM R FELLMAN
PREPARED BY J NORTH
FISCAL YEAR 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
[REDACTED]
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.HD
CTRL ACCT: HS1A
CHARGE NO: HS1AX FINAL DESIGN - FFI
COMMENT#: F07-001, F07-035, F07-061

Resource:	TPHO	TEAM PARTNER HOME OF	EOC:	LABOR											
Res Dept:	943	OverTime:	TP												
		DTEK	Class:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	
Yr Hours:				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	
Cum Hours:				0.0	979.0	1,103.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Yr Total Cost:				0.0	979.0	2,082.3	2,082.3	2,082.3	2,082.3	2,082.3	2,082.3	2,082.3	2,082.3	2,082.3	
Cum Total Cost:				0	99,595	118,665	218,481	218,481	218,481	218,481	218,481	218,481	218,481	218,481	

Resource:	TPSREP	TECH/PROG SUPT REP	EOC:	LABOR											
Res Dept:	943	OverTime:	SAL												
			Class:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	
Yr Hours:				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	
Cum Hours:				0.0	310.6	933.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Yr Total Cost:				0.0	310.6	1,244.1	1,244.1	1,244.1	1,244.1	1,244.1	1,244.1	1,244.1	1,244.1	1,244.1	
Cum Total Cost:				0	16,987	54,077	71,065	71,065	71,065	71,065	71,065	71,065	71,065	71,065	

Resource:	WSTENG	WASTE ENGINEER	EOC:	LABOR											
Res Dept:	943	OverTime:	SAL												
			Class:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	
Yr Hours:				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	
Cum Hours:				0.0	168.0	1,003.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Yr Total Cost:				0	9,024	57,064	66,087	66,087	66,087	66,087	66,087	66,087	66,087	66,087	
Cum Total Cost:				0	9,024	66,087	66,087	66,087	66,087	66,087	66,087	66,087	66,087	66,087	

Resource:	WSTMGR	WASTE ENGINEER MGR	EOC:	LABOR											
Res Dept:	943	OverTime:	SAL												
			Class:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	
Yr Hours:				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	
Cum Hours:				0.0	84.0	501.5	585.5	585.5	585.5	585.5	585.5	585.5	585.5	585.5	
Yr Total Cost:				0	4,865	30,763	35,627	35,627	35,627	35,627	35,627	35,627	35,627	35,627	
Cum Total Cost:				0	4,865	35,627	35,627	35,627	35,627	35,627	35,627	35,627	35,627	35,627	

GRAND TOTALS:

Yr Hours:		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-
Cum Hours:		Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10
Yr Total Cost:		0	3,229.0	7,955.3	11,184.3	11,184.3	11,184.3	11,184.3	11,184.3	11,184.3	11,184.3	11,184.3
Cum Total Cost:		0	274,009	659,702	933,711	933,711	933,711	933,711	933,711	933,711	933,711	933,711

Fluor Fernald, Inc.

PBS: OHFN07
WBS: 1.1.HD
CTRL ACCT: HS1A
CHARGE NO: HS1AX FINAL DESIGN - FFI
COMMENT#: F07-001, F07-035, F07-061

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
* STATED IN FY01 DOLLARS****
(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

CAM *Robert Fellman*

CONTROL TEAM *Stephen J. North*

HS1AY

FINAL DESIGN - JACOBS

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

(1 FTE EQUALS 1747 HOURS)

DATE: 09/05/01
PROJECT MGR R FELLMAN
CAM R FELLMAN
PREPARED BY J NORTH
FISCAL YEAR 2001-2008

PBS: OHFN07
WBS: 111D
CTRL ACCT HS1A
CHARGE NO HS1AY
COMMENT# F07-001, F07-035, F07-061
Resource: SERVSUB
Res Dept: 942

Overnight: JEG Class: SUB
ECC: SUB

	Oct 00-		Oct 01-		Oct 02-		Oct 03-		Oct 04-		Oct 05-		Oct 06-		Oct 07-		Oct 08-		Oct 09-	
	Subs	Overtime	Subs	Overtime	Subs	Overtime	Subs	Overtime	Subs	Overtime	Subs	Overtime	Subs	Overtime	Subs	Overtime	Subs	Overtime	Subs	Overtime
Yr Units:	0	0	2,858,655	0	3,354,352	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Units:	0	0	2,858,655	0	6,213,007	0	6,213,007	0	6,213,007	0	6,213,007	0	6,213,007	0	6,213,007	0	6,213,007	0	6,213,007	0
Yr Total Cost:	0	0	2,935,839	0	3,537,932	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	2,935,839	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0

GRAND TOTALS:

Yr Total Cost	0	0	2,935,839	0	3,537,932	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	2,935,839	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0	6,473,771	0

CAM
Robert Fellman
CONTROL TEAM *Joseph Beck*

HS1A1

**ENG SPRT OF CONST, STUP, OPS, D&D –
FLUOR FERNALD**

Fluor Fernald, Inc.

DATE: 09/05/01
PROJECT MGR R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
[REDACTED]
(1 FTE EQUALS 1747 HOURS)

PBS: OHFN07
WBS: 1.1.HD
CTRL ACCT: HS1A
CHARGE NO: HS1A1 FFI - ENGR. SUPPORT OF CONSTR/STUP/OPS/D&D
COMMENT#: F07-001, F07-035, F07-061

Resource:	Res Dept:	DREFCAD 943	Class:	LABOR											
				DRAFTER/CAD OPERATOR		ENGINEER CIVIL		ENGINEER		ENGINEER		ENGINEER		ENGINEER	
				Overtime:		Overtime:		Overtime:		Overtime:		Overtime:		Overtime:	
				Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	Oct 09-
				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours:				0.0	0.0	74.4	174.7	174.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				0.0	0.0	74.4	249.1	423.8	423.8	423.8	423.8	423.8	423.8	423.8	423.8
Yr Total Cost:				0	0	2,587	6,433	6,814	0	0	0	0	0	0	0
Cum Total Cost:				0	0	2,587	9,020	15,835	15,835	15,835	15,835	15,835	15,835	15,835	15,835

Resource:	Res Dept:	ENGINEER CIVIL 943	Class:	LABOR											
				ENGINEER CIVIL		ENGINEER									
				Overtime:		Overtime:		Overtime:		Overtime:		Overtime:		Overtime:	
				Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	Oct 09-
				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours:				0.0	0.0	118.5	790.9	822.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				0.0	0.0	118.5	909.4	1,731.4	1,731.4	1,731.4	1,731.4	1,731.4	1,731.4	1,731.4	1,731.4
Yr Total Cost:				0	0	7,184	50,778	55,903	0	0	0	0	0	0	0
Cum Total Cost:				0	0	7,184	57,962	113,865	113,865	113,865	113,865	113,865	113,865	113,865	113,865

Resource:	Res Dept:	ENGINEER 943	Class:	LABOR											
				ENGINEER		ENGINEER		ENGINEER		ENGINEER		ENGINEER		ENGINEER	
				Overtime:		Overtime:		Overtime:		Overtime:		Overtime:		Overtime:	
				Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	Oct 09-
				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours:				0.0	0.0	1,749.9	2,791.4	2,588.9	2,542.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:				0.0	0.0	1,749.9	4,541.3	7,130.2	9,672.2	9,672.2	9,672.2	9,672.2	9,672.2	9,672.2	9,672.2
Yr Total Cost:				0	0	134,147	225,606	222,625	233,542	0	0	0	0	0	0
Cum Total Cost:				0	0	134,147	360,753	583,378	816,920	816,920	816,920	816,920	816,920	816,920	816,920

Resource:	Res Dept:	ENGR PROCESS/STARTUP 943	Class:	LABOR											
				ENGR PROCESS/STARTUP		ENGR PROCESS/STARTUP		ENGR PROCESS/STARTUP		ENGR PROCESS/STARTUP		ENGR PROCESS/STARTUP		ENGR PROCESS/STARTUP	
				Overtime:		Overtime:		Overtime:		Overtime:		Overtime:		Overtime:	
				Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	Oct 09-
				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	Sep 10
Yr Hours:				0.0	0.0	592.5	592.5	592.5	592.5	592.5	592.5	592.5	592.5	592.5	592.5
Cum Hours:				0.0	0.0	592.5	1,185.0	1,777.5	2,370.0	2,962.5	3,555.0	4,147.5	4,740.0	5,332.5	5,925.0
Yr Total Cost:				0	0	36,979	36,979	36,979	36,979	36,979	36,979	36,979	36,979	36,979	36,979
Cum Total Cost:				0	0	36,979	73,958	110,937	147,916	184,895	221,874	258,853	295,832	332,811	369,790

Resource:	Res Dept:	ODCTRVL 943	Class:	ODC											
				ODC		ODC		ODC		ODC		ODC		ODC	
				Overtime:		Overtime:		Overtime:		Overtime:		Overtime:		Overtime:	
				Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-	Oct 09-	Oct 09-
				Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10	Sep 10	Sep 10
Yr Units:				0.0	0.0	93,600.0	93,600.0	93,600.0	93,600.0	93,600.0	93,600.0	93,600.0	93,600.0	93,600.0	93,600.0
Cum Units:				0.0	0.0	93,600.0	187,200.0	280,800.0	374,400.0	468,000.0	561,600.0	655,200.0	748,800.0	842,400.0	936,000.0
Yr Total Cost:				0	0	98,723	98,723	98,723	98,723	98,723	98,723	98,723	98,723	98,723	98,723
Cum Total Cost:				0	0	98,723	197,446	296,169	394,892	493,615	592,338	691,061	789,784	888,507	987,230

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING

CHARGE NO: HS1A1 FF - ENGR SUPPORT OF CONSTR/STU/OPS/D&D

COMMENT#: F07-001, F07-035, F07-061

DATE: 09/05/01
PROJECT MGR: R. FELLMAN
CAM: R. FELLMAN
PREPARED BY: J. NORTH
FISCAL YEAR: 2001-2008

Resource: Res Dept:	TPSREP 943	TECH/PROG SUPT REP Overline:	Class:	LABOR											
				EOC:		SAL		EOC:		SAL		EOC:		SAL	
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Cum Hours:		0.0	0.0	592.5	1,747.0	1,747.0	1,747.0	1,747.0	983.0	0.0	0.0				
Yr Total Cost:		0.0	0.0	592.5	2,399.5	4,086.5	5,833.5	7,580.5	8,563.5	8,563.5	8,563.5				
Cum Total Cost:		0	0	34,323	107,170	113,523	121,287	131,485	77,980	0	0				
		0	0	34,323	141,494	255,017	376,304	507,790	585,769	585,769	585,769				

Resource: Res Dept:	WSTMGR 943	WASTE ENGINEER MGR Overline:	Class:	LABOR											
				EOC:		SAL		EOC:		SAL		EOC:		SAL	
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Cum Hours:		0.0	0.0	372.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Yr Total Cost:		0.0	0.0	372.0	372.0	372.0	372.0	372.0	372.0	372.0	372.0				
Cum Total Cost:		0	0	22,819	22,819	22,819	22,819	22,819	22,819	22,819	22,819				

Resource: Res Dept:	TPSREP 943	TECH/PROG SUPT REP Overline:	Class:	LABOR											
				EOC:		SAL		EOC:		SAL		EOC:		SAL	
Yr Hours:		Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Cum Hours:		0.0	0.0	3,488.8	5,504.0	5,332.6	4,289.0	1,747.0	983.0	0.0	0.0				
Yr Total Cost:		0.0	0.0	3,499.8	9,003.8	14,336.4	18,625.4	20,372.4	21,355.4	21,355.4	21,355.4				
Cum Total Cost:		0	0	336,763	390,987	398,866	354,829	131,485	77,980	0	0				
		0	0	336,763	727,750	1,126,616	1,481,445	1,612,930	1,690,910	1,690,910	1,690,910				

CAM: *Robert Fellman* CONTROL TEAM: *Robert Fellman*

HS1A2

ENG SPRT OF CNST, STUP, OPS, D&D - JACOBS

Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET
FOR ACTIVITY BASED ESTIMATING
(1 FTE EQUALS 1747 HOURS)

PBS OHFN07 DATE: 09/05/01
 WBS 1.1HD PROJECT MGR R. FELLMAN
 CTRL ACCT H5A2 CAM R. FELLMAN
 CHARGE NO H5A2 JACOBS - ENGR. SUPPORT OF CONSTR/STUP/OPS/D&D PREPARED BY J. NORTH
 COMMENT# F07-001, F07-035, F07-061 FISCAL YEAR 2001-2008

Resource: Res Dept:	SERV SUB 943	SUBS Overtime:	JEG	Class:	EOC:		SUB										
					Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10				
Yr Units	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTALS:																	
Yr Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Robert Fellman

CONTROL TEAM

SECTION 4

5.0 RISK PLAN

Risk/Opportunity Identification and Analysis Form

Project: Silos 1&2 Remediation
 Evaluator: North
 Date: 08/16/01
 Date: 08/16/01
 WBS Number: 07
 WBS Number: 1.1.H.D
 Control Account Number: H51A
 Control Account Number: H51A
 Baseline Dollar (Minimum Case): \$233,362,443

Project Task	Risk and/or Opportunity	Potential Impact	External or Internal Driver	Impact Cost \$ (Maximum Case)	Risk Impact Level	Risk Probability, %	Risk Probability Level	Probable Cost \$ (Likeliest Case)	Risk Critical Value	Risk Handling Strategy
CO-1	Changes in site utilities, land use, D&D, infrastructure, etc. due to other closure activities and/or failures cause significant changes to facility tie-in work, plant layout, etc.	Construction costs for utility and infrastructure work increase by 50% over baseline.	Internal	\$400,000	2	20%	2	\$80,000	2	Accept
CO-2a	Site geotechnical conditions are worse than expected, resulting in a significant increase in site prep and foundation work.	Site prep and foundation costs increase by 50% over baseline costs.	Internal	\$1,000,000	3	20%	2	\$200,000	3	Accept
CO-2b, 3, 4a	Major construction schedule extension due to significant events or problems (project stand-down due to major injury, safety issues, major re-design or re-work, major site events, contractor default, major labor problems/strikes, etc.).	Construction schedule extension of 12 months, with additional costs for all groups.	Internal	\$38,400,000	5	30%	2	\$11,620,000	8	Accept
CO-4b, DE-2 + A43	Increased construction costs due to major re-work or re-design of facilities or processes.	Installed capital costs increase by 25% over baseline.	Internal	\$10,000,000	5	30%	2	\$3,000,000	8	Accept
CO-5	FFI-approved field changes are subsequently rejected by EPA or others, resulting in re-work and/or additional labor to justify the FFI interpretation of the requirements.	Installed capital costs increase by 5% over baseline.	Internal	\$2,000,000	3	40%	3	\$800,000	4	Accept
DD-1	Schedule delay during remediation facility D&D period due to various issues (subcontractor issues, stand-down due to injury or safety issue, unavailability of site support services and/or facilities, more stringent requirements, etc.).	Schedule extension of 3 months during D&D period, with additional costs for all groups.	Internal	\$1,600,000	3	40%	3	\$720,000	4	Accept
DD-2	Increased D&D costs due to higher than expected percentage of equipment being classified as 'excess property', rather than 'abandoned in place' (AIP).	Schedule extension of 2 months during D&D period, with additional costs for all groups.	Internal	\$1,200,000	3	30%	3	\$380,000	4	Accept
DD-3	Significant increase in disposal costs due to early closure of OSDF by FFI, such that all remediation facility D&D debris must be shipped off-site for disposal (NTS or other).	Assume 30% of D&D debris goes to NTS and the remainder goes to an off-site secure landfill. D&D off-site costs increase 10-fold.	Internal	\$6,000,000	4	30%	3	\$1,800,000	7	Accept

Risk/Opportunity Identification and Analysis Form

Project: Silos 1&2 Remediation		Date: 08/13/01		Baseline: Dollars (Minimum Case): \$239,362,643						
Evaluator: North		Date: 08/13/01		WBS Number: 1.1.H.D						
CAM: Fellowship		Date: 08/13/01		Control Account Number: HSTA						
Project Task	Risk and/or Opportunity	Potential Impact	External or Internal Driver	Impact Cost \$ (Maximum Case)	Risk Level	Risk Probability, %	Risk Probability Level	Probable Cost \$ (Likeliest Case)	Risk Critical Value	Risk Handling Strategy
DD-4	Increased disposal costs due to higher than expected quantities of remediation facility debris requiring off-site disposal at NTS, rather than placement in the OSDF.	D&D off-site costs increase by 100% over baseline.	Internal	\$800,000	2	50%	3	\$300,000	2	Accept
DD-5	Silo 3 debris does not meet OSDF WAC, such that it must be packaged and shipped to NTS for disposal.	Additional packaging and transport costs for Silo 3 D&D	Internal	\$1,078,000	3	30%	2	\$323,400	2	Accept
DE-1	Schedule delays due to different interpretation of regulations and DOE Orders (e.g. - DOE 413.3), resulting in additional review periods by DOE-HQ and others.	Schedule extension of 3 months during middle and late stages of design for extended review and approval periods.	Internal	\$2,100,000	3	50%	4	\$1,050,000	6	Accept
OM-1a,b,c	Operations startup delay due to site problems, site support staff not available or delays in AWR completion.	Operations schedule delay of 6 months, with additional costs for all groups.	Internal	\$15,000,000	5	30%	4	\$4,800,000	11	Reduce or Mitigate
OM-2a	Increased ODCs due to higher than expected chemical usage and/or price.	Chemical costs increase by 50% over baseline.	Internal	\$2,200,000	3	30%	3	\$680,000	4	Accept
OM-2b	Increased ODCs due to higher than expected carbon usage and/or price.	Carbon costs increase by 50% over baseline.	Internal	\$250,000	2	30%	3	\$75,000	2	Accept
OM-2c	Increased ODCs due to higher than expected treatment costs for water discharged to AWWT (larger quantity of water and/or more extensive treatment).	Water treatment costs increase by 100% over baseline.	Internal	\$300,000	2	50%	3	\$150,000	2	Accept
OM-2d	Increased ODCs due to higher than expected consumption and/or price of spare parts, consumables, supplies, etc.	Spare parts, consumables, supplies cost increase by 50% over baseline.	Internal	\$2,000,000	3	40%	3	\$800,000	4	Accept
OM-2e	Increased ODCs due to sampling and analysis issues (higher than expected sampling/analytical requirements, revised approach for procuring analytical services, need for faster turnaround times, etc.).	Analytical costs increase by 50% over baseline.	Internal	\$500,000	2	60%	4	\$300,000	3	Accept
OM-3a, b,c	Major operations schedule extension due to accident or mishap during transportation of waste containers to NTS.	Operations schedule extension of 12 months, with additional costs for all groups.	Internal	\$30,000,000	5	30%	2	\$9,000,000	8	Accept

Risk/Opportunity Identification and Analysis Form

Project: Silos 1&2 Remediation		WBS Number: 07		Baseline Dollars (Minimum Case)		Baseline Dollars (Maximum Case)				
Evaluator: North		Control Account Number: HS1A		Date: 08/16/01		Date: 08/16/01				
CAMR # 001		Internal or External Driver		Impact Cost \$ (Maximum Case)		Risk Probability, % Level				
Risk and/or Opportunity		Potential Impact		Risk Impact Level		Risk Probability, % Level				
Project Task	Risk and/or Opportunity	Potential Impact	Internal or External Driver	Impact Cost \$ (Maximum Case)	Risk Impact Level	Risk Probability, % Level	Risk Probability Level	Probable Cost \$ (Likeliest Case)	Risk Critical Value	Risk Handling Strategy
OM-3d	Operations cost increase due to lower than expected waste loadings.	Operations labor, supplies, and consumables costs increase. Assume costs equivalent to 2 month schedule extension.	Internal	\$5,000,000	4	60%	4	\$3,000,000	8	Accept
OM-4b	Increased labor costs due to added inspection, reporting, or procedural requirements from internal audits/assessments.	O&M staffing increase of 5% over baseline during SOT, ORR, and Operations periods.	Internal	\$2,000,000	3	20%	2	\$440,000	3	Accept
OM-6	Severe damage to facility control system from lightning or power supply anomaly, causing total shutdown of operations to complete repairs.	Operations schedule extension of 3 months to repair/replace affected components, with additional costs for all groups.	Internal	\$7,500,000	4	10%	1	\$750,000	3	Accept
OM-7	Environmental release of Radon or other hazardous material.	Fines and/or additional efforts and costs associated with NOVs, etc.	Internal	\$500,000	2	10%	1	\$50,000	1	Accept
OM-8a	Major operations schedule extension due to significant events or process problems (project stand-down due to major injury, safety issues, releases to environment, major process re-design, etc.)	Operations schedule extension of 12 months, with additional costs for all groups.	Internal	\$30,000,000	5	20%	2	\$6,000,000	8	Accept
OM-8b	Significant events or process problems result in major changes to facility or equipment.	20% increase in installed capital costs for design, construction, and testing of major process modifications. (Note: schedule delay captured in Item OM-8a.)	Internal	\$8,000,000	4	20%	2	\$1,600,000	5	Accept
WA-1	Increased ODCs due to increases in unit costs for transportation, disposal, or containers.	Packaging, transportation, and disposal costs increase by 10% over baseline.	Internal	\$7,407,000	3	30%	3	\$1,407,000	4	Accept
WA-2	Increased costs due to inability to find approved alternate disposal option for off-spec (failed TCLP) containers of treated K-65 material.	10% increase in installed capital costs associated with design, construction, and operation of a small facility on-site to re-work the failed material.	Internal	\$4,000,000	3	30%	3	\$1,200,000	4	Accept
WA-3	Increased ODCs due to lower than expected waste loadings.	Packaging, transportation, and disposal costs increase by 10%.	Internal	\$1,407,000	3	30%	3	\$1,407,000	4	Accept
WA-4a	Increased ODCs due to higher than expected number of off-spec containers (failed TCLP) of treated K-65 material, which must be sent for alternate, higher cost, disposal.	Reject (TCLP) container percentage increases from 1% (baseline) to 5%, with associated incremental disposal cost increase (10% increase in K-65 wastes disposal costs).	Internal	\$3,938,000	3	20%	2	\$938,000	3	Accept

Risk/Opportunity Identification and Analysis Form

Project: Silos 1&2 Remediation		WBS Number: 07		Baseline Dollars (Minimum Case): \$233,362,643				
Evaluator: North		Date: 08/13/01		WBS Number: 1.1.H.D				
GAM: [redacted]		Date: 08/13/01		Control Account Number: HSTA				
Risk and/or Opportunity		Potential Impact		Risk Probability, %				
Risk Driver		Risk Impact Level		Risk Probability, %				
Impact Cost \$ (Maximum Case)		Risk Level		Risk Probability, %				
Probable Cost \$ (Likeliest Case)		Risk Level		Risk Probability, %				
Risk Handling Strategy		Risk Level		Risk Probability, %				
WA-4b	Increased ODCs due to higher than expected number of off-spec containers (excessive rad levels) of treated K-65 material which require additional shielding for transport and handling (on-site and at NTS).	Reject (excessive rad level) container percentage increases from 2% (baseline) to 5%, with added costs for shielding materials, transport, and handling (labor).	2	60%	4	\$480,000	3	Accept
WA-5	Increased ODCs due to higher than expected quantities of secondary waste, some of which requires off-site disposal at NTS.	Secondary waste costs increase by 100% over the baseline estimate.	3	60%	4	\$1,200,000	5	Accept
Total:		\$1,888,898,000		Total:		\$54,110,400		
EX-1	Major operations schedule extension due to significant external transportation and/or disposal problems (NTS shutdown, public opposition en route or at NTS, etc.).	Operations schedule extension of 8 months, with additional costs for all groups.	5	30%	3	\$6,000,000	10	
EX-2	Increased labor costs due to added inspection, reporting or process requirements from Externs audits/assessments	O&M staffing increase of 10% over baseline during SOT, ORR, and Operations periods.	3	50%	4	\$2,200,000	5	
EX-3	Significant increase in facility costs due to added back items from reviews by External groups (DNRSB, CA, EPA, DOE, HOF, CAB, etc.)	Facility capital costs increase 25% above baseline estimate.	5	50%	3	\$5,000,000	10	
EX-4	Increased design/labor costs due to purchase of things and network (External sources)	Engineering labor costs increase by 50% above baseline.	5	50%	3	\$6,450,000	10	
EX-5	Significant increase in disposal costs due to mandated early closure of OSDF by EPA or DOE, such that all D&D debris must be shipped off-site for disposal (NTS or other).	Assume 30% of D&D debris goes to NTS and the remainder goes to an off-site secure landfill. D&D off-site costs increase 10-fold.	4	40%	3	\$2,400,000	7	
PLUS-1	Envirocare modifies permits to allow disposal of K-65 material	Rail shipment becomes feasible, lowering transport costs by 20%, and reducing risks.		20%		\$1,875,000		

Risk/Opportunity Identification and Analysis Form

Project: Silos 1&2 Remediation		PBS Number: 07		Baseline Dollars (Minimum Case): \$233,382,843		
Evaluator: North		WBS Number: 1.1.H.D				
CAM: Felman		Control Account Number: HS1A				
Date: 08/16/01		Date: 08/16/01				
Date: 08/16/01		Date: 08/16/01				
Project Task		Risk and/or Opportunity		Potential Impact		
Risk		Internal or External Driver		Risk Impact Level		
Risk Probability, %		Risk Probability, %		Risk Probability Level		
Probable Cost \$ (Likeliest Case)		Impact Cost \$ (Maximum Case)		Risk Critical Value		
Risk Handling Strategy						
PLUS-2	Facility/process simplification during design development provides design and capital cost reductions.	Internal	Design labor and installed capital costs decrease by 20%.	20%	\$2,632,000	
PLUS-3	Higher than expected operating availability shortens operations period.	Internal	Operations schedule reduced by 2 months, with associated cost decreases for all groups.	20%	-\$1,000,000	
PLUS-4	Review of operations labor requirements allows significant reductions in labor force.	Internal	O&M labor costs decrease by 30% from baseline.	20%	\$2,640,000	

