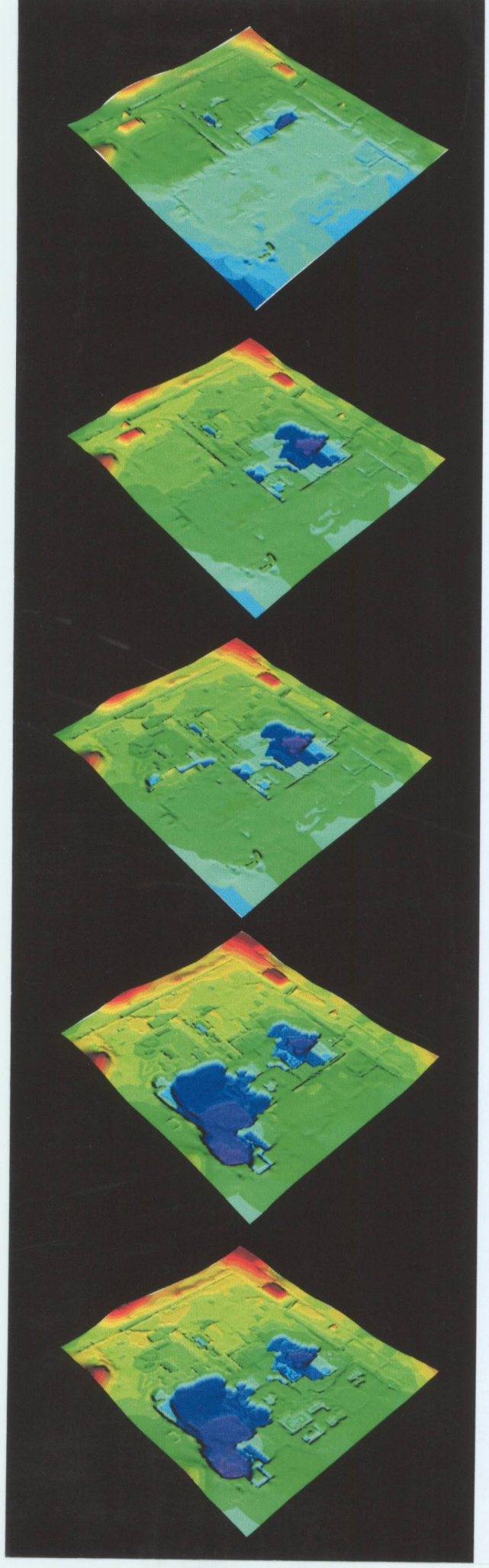
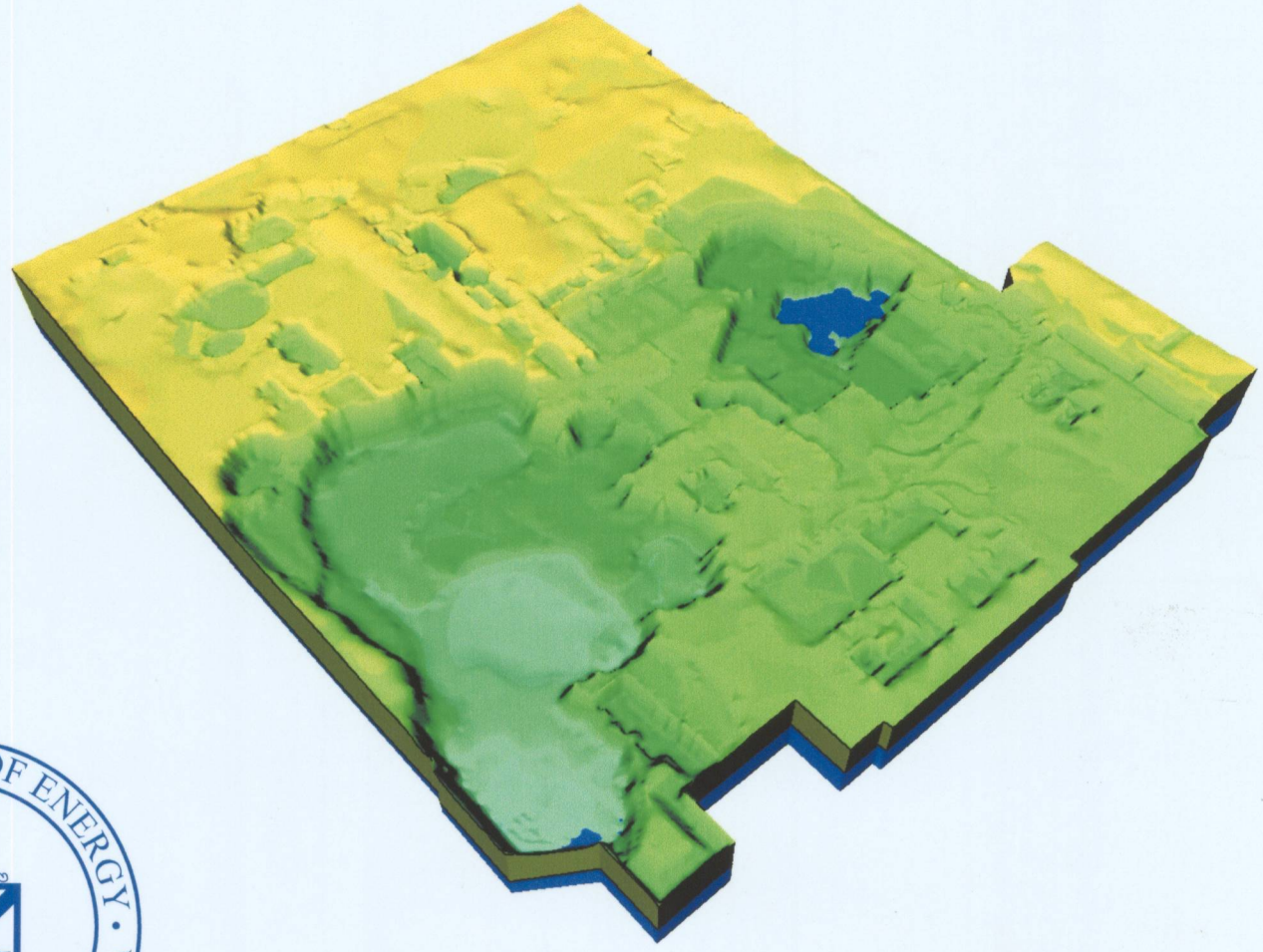


Advanced Conceptual Design for the At- and Below-Grade Remediation of the Former Plant Area

Fernald Environmental Management Project
Fernald, Ohio

20201-PL-0002



DEPARTMENT OF ENERGY · UNITED STATES OF AMERICA

FLUOR DANIEL FERNALD

LOCKWOOD GREENE TECHNOLOGIES

STEP Inc.

L-2250

ADVANCED CONCEPTUAL DESIGN FOR THE AT- AND BELOW-GRADE REMEDIATION OF THE FORMER PLANT AREA

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

FLUOR DANIEL FERNALD
CONTRACT NO. 98PC001323
TASK ORDER L-008

LOCKWOOD GREENE TECHNOLOGIES, INC.
OAK RIDGE, TENNESSEE

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ADVANCED CONCEPTUAL DESIGN FOR THE AT- AND BELOW-GRADE REMEDIATION OF THE FORMER PLANT AREA

L-2250

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LIST OF ACRONYMS AND ABBREVIATIONS

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ACD	Advanced Conceptual Design
ALARA	as low as reasonably acheivable
AWWT	Advanced Waste Water Treatment (facility)
BAT	Best Available Technology
BCF	bank cubic ft
BCY	bank cubic yards
BSL	Biodenitrification Surge Lagoon
CAMU	corrective action management unit
CDL	Certification Design Letter
CFR	*Code of Federal Regulations*
cm^2	centimeters squared
COC	constituent of concern
DCP	Design Criteria Package
DOE	U. S. Department of Energy
dpm	disintegrations per minute
D&D	decontamination and dismantlement
ECC	estimated construction cost
EPA	U. S. Environmental Protection Agency
FCY	fill cubic yards
FDF	Fluor Daniel Fernald
FEMP	Fernald Environmental Management Project
FPC	fixed-price contractor
FRL	final remediation level
ft	foot
FY	fiscal year
gpm/ft	gallons per minute per foot
GMA	Great Miami Aquifer
H	horizontal
HPGe	high purity germanium detector
HWMU	hazardous waste management unit
IEMP	Integrated Environmental Monitoring Plan
IMPP	Imported Materials Placement Plan
IRDP	integrated remedial design package
LCY	loose cubic yards
LGT	Lockwood Greene Technologies, Inc.
mg/kg	milligrams per kilogram
MSL	mean sea level
NAD	North American Datum
NRC	U.S. Nuclear Regulatory Commission
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
OMTA	OSDF Material Transfer Area
OPC	other project costs
OSDF	On-Site Disposal Facility
O&M	operation and maintenance

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OU	operable unit
PCB	polychlorinated biphenyl
PCDF	Permitted Commercial Disposal Facility
PCOC	Primary Constituent of Concern
PPE	personal protective equipment
PSP	project specific plan
RCRA	Resource Conservation and Recovery Act of 1976
RI/FS	remedial investigation/feasibility study
RIMIA	Receiving/Incoming Materials Inspection Area
ROD	record of decision
SCEP	Soil Characterization and Excavation Project
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SVOC	semi-volatile organic compound
SWRB	Stormwater Retention Basin
S/S	solidification/stabilization
S&WP	Soil and Water Projects
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
UST	underground storage tank
V	vertical
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization
WBS	work breakdown structure
WMF	Water Management Facility

ADVANCED CONCEPTUAL DESIGN OF THE AT- AND BELOW-GRADE REMEDIATION OF THE FORMER PLANT AREA

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1.0 Introduction

This document presents the Advanced Conceptual Design (ACD) for remediation of the Former Plant Area at the Fernald Environmental Management Project (FEMP). The Former Plant Area covers approximately 136 acres and is comprised of the Former Production Area (Areas 3A, 3B, 4A, and 4B) and the Administration Area (part of Area 5 north of the main parking lot). Figure 1-1 illustrates the general configuration of the project area.

Remediation of the Former Plant Area is complex because of the wide variety of uranium and thorium processing facilities and operations that occurred from 1952 to 1989. The primary mission of FEMP was production of uranium metal in support of programs carried out for the U.S. Nuclear Weapon Complex. In addition, the site also processed thorium at various times from 1954 to 1979. During this period, large quantities of uranium and thorium product were sent off site to other government-owned processing facilities and reactor sites. Some product was also stored within the Former Production Area for future use.

During preparation of the Sitewide Excavation Plan (SEP), it was recognized that excavation inside the Former Plant Area (i.e., Areas 3, 4, and 5) faced unique obstacles and issues (e.g., the density of buried utility lines, perched groundwater, deep excavations). To address these issues properly in the integrated remedial design packages (IRDPs) for Areas 3, 4, and 5, the Soil Characterization and Excavation Project (SCEP) management team realized that input would be required from many FEMP organizations to resolve general concerns on building demolition schedules, waste management issues, excavation sequencing, and the OSDF soil/debris volumes.

The SCEP management team agreed to produce a conceptual design that would address important issues associated with remedial actions in the Former Plant Area. Once approved, the conceptual design would represent a generic remedial approach that was generally accepted by the U.S. Department of Energy (DOE), Fluor Daniel Fernald (FDF) and affected stakeholders. Agreement on these remedial issues prior to development of IRDPs is desirable with respect to minimizing the time required for IRDP review and comment resolution. This ACD is the product of the noted integration effort to deal with remedial issues in the Former Plant Area.

The ACD presents the strategic remediation and excavation plan for the impacted soil, perched groundwater, at- and below-grade structures and utilities, specific above-grade structures (e.g., Tank Farm sediment trap, aboveground equipment foundations), and special materials encountered during excavation in the Former Plant Area. Additionally, the ACD summarizes important design considerations and suggests methods of implementation that will be used as the basis for the Title I and II remediation design. The ACD was developed in accordance with the FEMP Operable Units (OU) 5 and 3 Records of Decision (ROD), and is intended to satisfy stakeholder objectives and meet the DOE's performance milestones identified for the program. Key project elements presented in the ACD include the 3-D subsurface contamination and extent of excavation model, design objectives, excavation sequencing, waste management planning, construction cost estimate, and project remediation schedule.

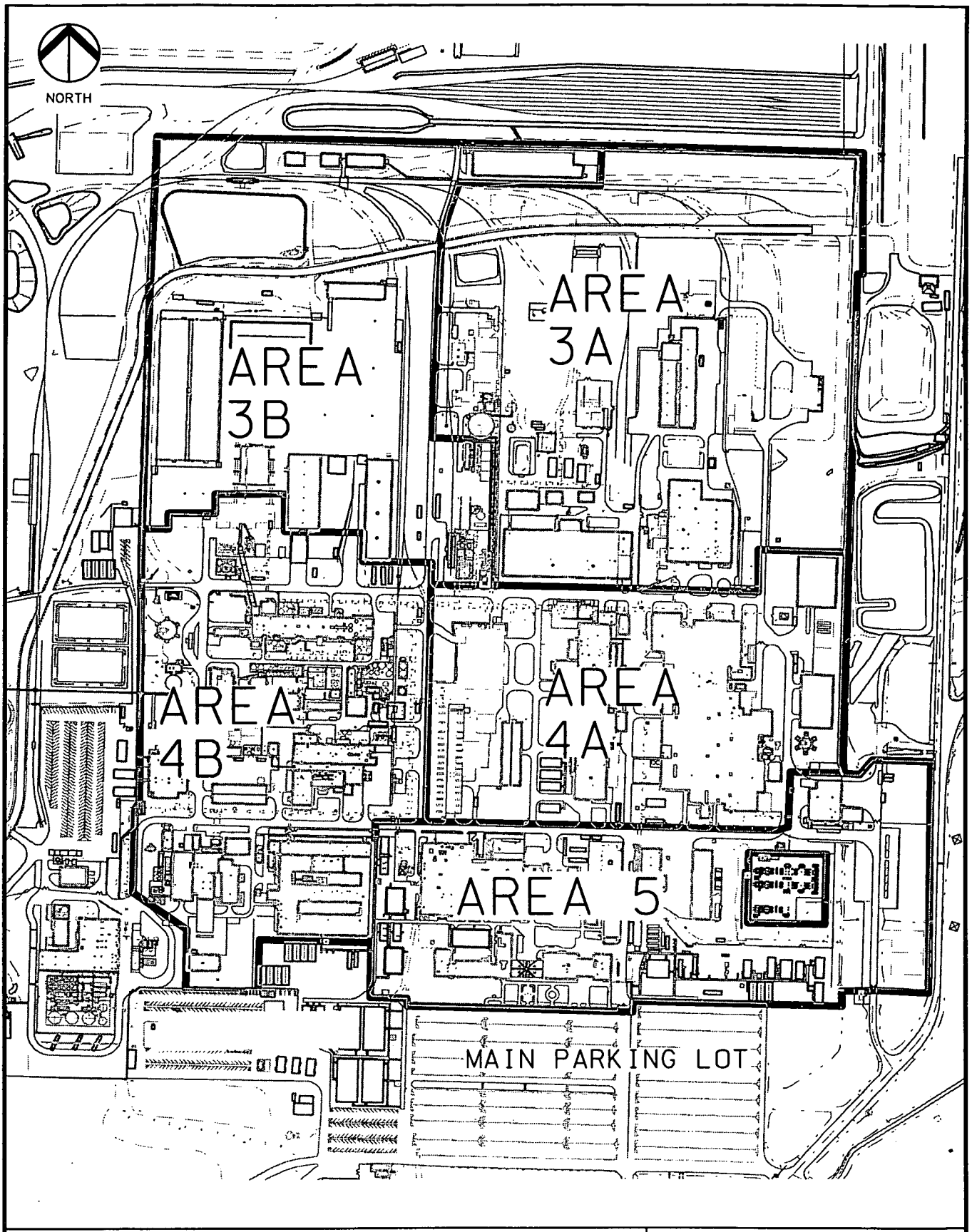

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FIGURE 1-1
FORMER PLANT AREA

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1.1 Objective and Purpose

The overall remediation objective for the Former Plant Area is to excavate and place impacted material in the On-Site Disposal Facility (OSDF), temporarily stage impacted material before bulk shipments to an appropriate off-site disposal facility [e.g., soil above the OSDF waste acceptance criteria (WAC)], or containerize impacted material for on-site or off-site treatment and disposal. Impacted material includes soil, manmade structures, perched groundwater, and other material with contaminant concentrations above their respective final remediation levels (FRLs). Remediation activities will also emphasize minimization of the volume of above WAC waste material shipped off site, segregation of items prohibited from disposal in the OSDF, efficient segregation and sizing of debris, and stabilization of excavation slopes. Waste material destined for off-site disposal will be transported from the excavation area to an interim staging area before off-site shipment.

The principal purpose of the ACD is to evaluate strategic planning issues and critical areas of the Title I and II design with all technical, managerial, and stakeholder parties to arrive at a consensus and path forward for developing the final remedial design for areas within the Former Production Area. The ACD includes, but is not limited to, the following design issues:

- excavation sequencing (Sections 6.0 to 6.7),
- excavation quantities (Section 6.2),
- foundation and structure removal (Section 4.6),
- utility removal (Section 6.2),
- stormwater control (Section 4.3),
- perched groundwater control (Section 4.4),
- waste segregation (Section 5.3),
- waste hauling (Sections 6.1 and 6.2),
- waste disposition (Sections 5.0 to 5.2),
- dust control (Section 4.2),
- radiological control (Section 4.1), and
- scheduling (Section 9.0).

This ACD also identifies key design and coordination issues that require resolution during Title I and II design activities (Section 1.5). The resolution of these issues will be presented as part of the IRDPs for Remediation Areas 3, 4, and 5.

1.2 ACD Process

During development of the ACD process, FDF and Lockwood Greene Technologies (LGT) have worked as an integrated project team in the development of the preliminary 3-D model of the extent of excavation, the Design Criteria Package (DCP), and the ACD document. FDF and LGT have worked to meet the objectives identified in the "Scope of Work for the Advanced Conceptual Design of the At- and Below-Grade Remediation of the Former Plant Area" (20300-SOW-0002/L-008, Revision 0, October 1998) and the "Functional Requirements Document for the Former Plant Area" (20300-PL-0003, Revision 0, December 1998). The integrated team approach has been successful, and the ACD objectives have been met through alignment and

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programming meetings, weekly telephone conferences, correspondence, progressive document reviews, comment resolution meetings, and individual interviews.

Alignment and programming meetings served to introduce the LGT project team to the key decision makers associated with the DOE and FDF team. The key members of the DOE and FDF team included the DOE Manager for the Soil and Water Projects (S&WP), the FDF Vice President for the S&WP, the Director of SCEP; a project under the S&WP, and the Area 3A/4A Project Manager and team. The meetings also took place with personnel representing safety and health, Remediation Areas 1 and 2, Information Management Services, construction, documents and records, Waste Acceptance Organization (WAO), the Facility Closure and Demolition Project, the OSDF Project, the Advanced Waste Water Treatment (AWWT) Facility, and quality assurance.

After the alignment and programming meetings, LGT submitted a Task Order Plan to FDF to outline the scope of work, deliverables, and schedule. Major deliverables included the 3-D model of uranium contamination and excavation, the DCP, and the ACD. The DOE and affected FDF organizations (safety and health, WAO, construction, etc.) were provided a copy of their pertinent deliverables for review. Review and comment resolution of the major deliverables was carried out via teleconferences and meetings between LGT and FDF.

1.3 Assumptions

Major assumptions developed by the integrated project team (DOE, FDF program management, SCEP project team, and LGT project team) as part of the ACD process include the following:

1. 3-D model assumptions.

- The 3-D model was developed to depict only uranium contamination.

- The uranium contamination includes the extent of all inorganic, organic, and radiologic constituents of concern (COC).

- Excavation depths below areas of leachable and less leachable uranium (See High Leachability Boundaries, Figure A-6) have been identified using uranium soil FRLs of 20 and 82 mg/kg, respectively.

- Where the silt and sand material containing perched groundwater extended past the boundaries of the leachable uranium areas (i.e., a continuous silt and sand lense), the associated soil outside the boundary was identified for excavation to a uranium soil FRL of 20 mg/kg. In soil underlying areas containing less leachable uranium, the excavation boundaries were developed to capture all total uranium material greater than 82 mg/kg. In addition, the excavation boundaries were expanded to capture any as low as reasonably achievable (ALARA) uranium (50 mg/kg) up to three ft below the excavation boundary

defined by the 82 mg/kg. Based on these excavation boundaries, soil volumes were developed for excavated material targeted for the OSDF and off-site disposition. Figure 1-2 shows the modeling results depicting the final site topography as a result of the excavation activities.

2. The ACD would only develop generic concepts and approaches associated with the remedial actions. Development of specific engineering details (e.g., stormwater volumes, sediment trap sizing, details for maintaining existing utilities) will be handled during Title I and II design.

3. The ACD would identify all strategic planning issues and critical areas of Title I and II design. Title I design activities will address planning issues and critical areas of design that remain unresolved.

4. No formal regulatory reviews will be required for the ACD.

5. Decontamination and demolition (D&D) of buildings will be completed on schedule, and all D&D waste identified for disposal in the OSDF will be properly staged while awaiting disposal. The transportation of the D&D waste to the OSDF will be coordinated with the placement of contaminated soil.

6. SCEP remediation activities will begin in April 2001 and will be performed under three separate procurement packages. All excavation activities will be completed in September 2005 to allow the OSDF cells to be capped by the close of September 2006.

7. The OSDF can receive contaminated soil at a rate of six trucks per hour per open cell (maximum of three cells). To meet this haul rate, trucks will not be required to go through a wheel wash station for decontamination and/or dust control. Dust control will be handled by spreading water on the haul road.

8. Based on the assumed haul rate and worker efficiency (Section 8), excavation activities will deliver 42,000 bank cubic yards (BCY) of soil per month to the OSDF.

9. Thirty percent of the total soil volume excavated by the project will require some level of de-watering.

10. Annual project funding will be sufficient to sustain or expedite excavation activities to meet DOE's performance milestones for FEMP.

1.4 Major Recommendations

Based on the project team's planning and design efforts, several major recommendations have been identified to help the project meet DOE's performance milestones and objectives, while reducing the total project cost and ensuring the viability of the project schedules. The following recommendations have been identified for the 3-D excavation model and excavation activities:

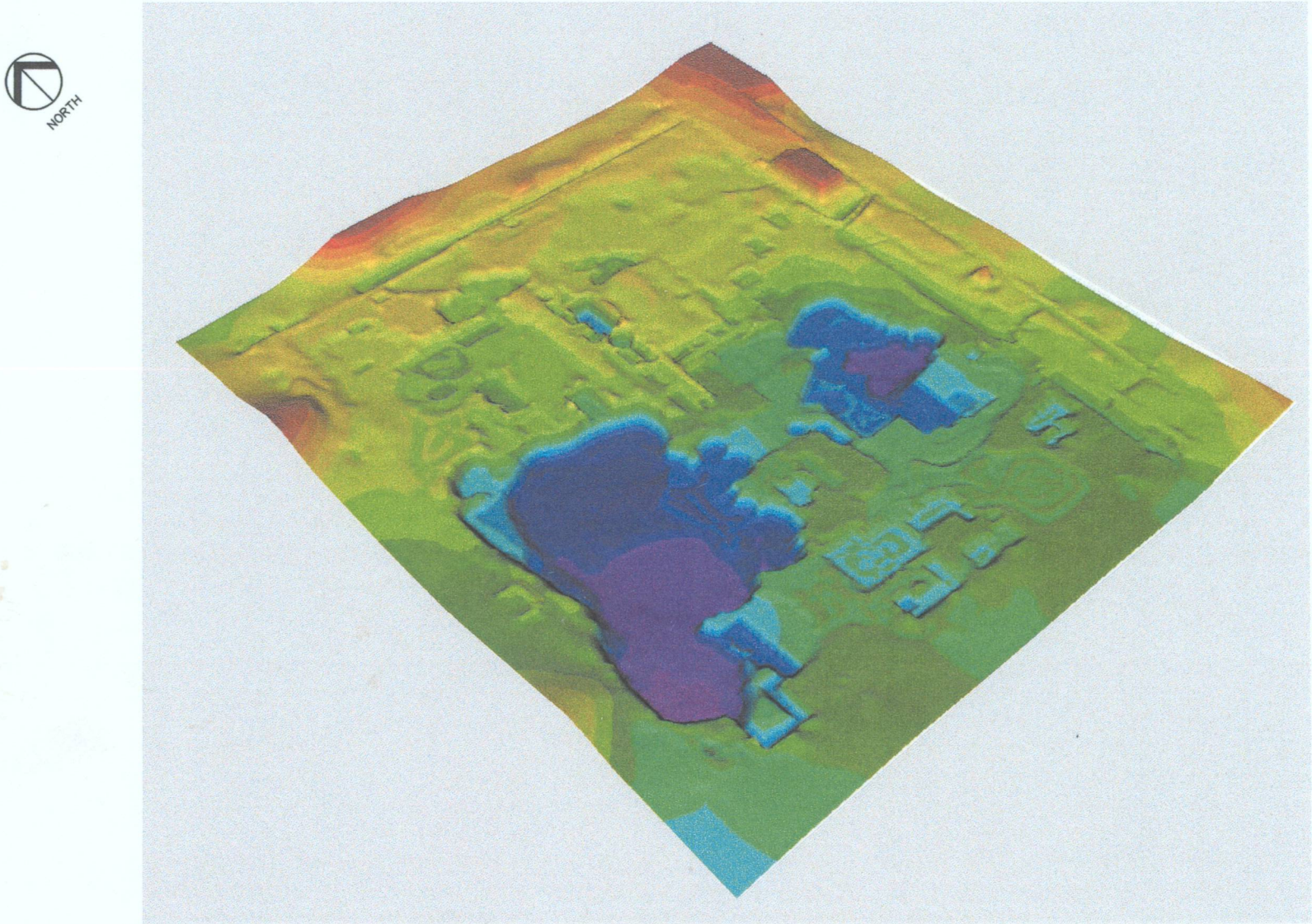

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FIGURE 1-2

FINAL SITE TOPOGRAPHY FOLLOWING EXCAVATION ACTIVITES - FORMER PLANT AREA

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1. 3-D Excavation Model - Continue to collect new and/or utilize existing characterization data to better quantify and qualify the various parameters of the 3-Dexcavation model. The objectives of this work would include:

- refine the volume of above-WAC soil and Resource Conservation and Recovery Act of 1976 (RCRA) characteristic waste,
- verify that all organic and inorganic contaminants are located in the uranium excavation zone,
- better define the boundaries of leachable uranium contamination, and
- incorporate accurate building foundations and basements.

2. Excavation Sequencing and Implementation – Examine opportunities to maximize improvements to excavation sequencing and implementation. Recommendations include:

- Minimize the requirement for truck wheel wash stations in order to maintain the rate of soil disposition to the OSDF. If dust control becomes a significant problem, consider implementing controls on the haul roads rather than on each truck.
- Remove the existing haul road from service early in the construction phase for Area 3A to allow excavation to proceed from north to south.
- Expedite the start of construction activities in Areas 3B, 4B, and 5 as early as possible in order to balance the soil volume requirements (42,000 BCY per month) and to meet the truck haul rate of six trucks/hour/cell for the OSDF.
- Identify opportunities to place currently restricted soil-like material at the OSDF to supplement the soil volume requirements.
- Evaluate the soil/debris ratio requirements noted in the Imparted Materials Placement Plan (IMPP) to determine more efficient placement ratios for material placed at the OSDF.
- Look for opportunities to shut down operations on the Plant 1 Pad as early as possible to allow Area 3B to be sequenced as planned in the ACD. This will allow excavation activities to proceed from north to south and help minimize potential cross-contamination between Areas 3B and 4B.
- Allow the contractors to operate with multiple excavation shifts. This will require that the OSDF also will operate on multiple shifts.
- Consider phased certification activities for excavated areas to provide maximum flexibility in meeting soil volume requirements and excavation schedules.

- Once certification activities are completed for each area, allow the contractor to regrade the areas to maximize natural drainage characteristics and minimize long term maintenance costs associated with pumping activities.

1.5 Remaining Remediation Issues

Design and coordination issues that will require further development include the following:

- Perform additional characterization activities to better quantify the volumes of RCRA characteristic waste. These characterization activities will also determine whether these areas contain above-WAC material.

- The 3-D excavation model assumes that all non-uranium COCs were located in the uranium excavation footprint and were removed with the uranium. Additional characterization activities may be required to identify and quantify non-uranium COCs outside the uranium excavation boundaries.

- A formal protocol has not been developed for area certification following remediation activities. Further discussion is needed to evaluate the advantages and disadvantage of phased certification of areas rather than waiting to certify complete areas (Area 3A, Area 4A, etc.)

- Current soil volume estimates indicate that the project will not generate enough soil to meet the OSDF soil/debris ratios discussed in the IMPP. Further evaluation is needed to determine whether the soil/debris ratios can be optimized.

- Significant coordination efforts will be required with the OSDF operations to ensure the project schedule is met. Further discussions are needed on issues such as concurrent operation of multiple cells, multiple shift operations, and acceptance of currently restricted soil like materials.

- Coordination issues between the D&D and SCEP organizations are very important in meeting the project schedule. The D&D activities should be completed on schedule or ahead of schedule in order to expedite excavation in Areas 4A and 4B. These areas are needed to meet the soil volume requirements.

- Funding constraints are beyond the control of FDF, but they must be maintained at planned levels to meet the excavation schedule.

- ACD estimates on the rate of placing material at the OSDF (42,000 BCY per month) must be resolved with the OSDF estimate of 70,000 BCY per month.

2.0 Site Characterization

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This section discusses, by media type, the nature and extent of contamination and the affected areas of the site. The information in this section was taken from the OU 5 remedial investigation (RI)/ feasibility study (FS) reports.

2.1 Soil

Nature and Extent of Contamination

Extensive soil sampling conducted during the RI and other programs characterized the nature and extent of contamination resulting from past FEMP operations. Data from these investigations were used to establish FRLs for contaminants of concern, which are primarily uranium, thorium and radium. In addition, the extent or boundaries of uranium contamination are assumed to include the extent of all inorganic and organic contaminants. Predominant contaminants are defined based on frequency and magnitude of detections above background.

Total uranium concentrations in surface soil within the FEMP boundary typically range from background (3.7 mg/kg) to 100 mg/kg. Uranium concentrations above the established FRL background in subsurface soil are found at depths up to 20 ft or more in the Former Production Area.

Radium-226 contamination is limited to the former process areas and waste storage areas; however, there is no significant area of subsurface radium–226 contamination in the Former Production Area.

Like the radium–226 contamination, total thorium contamination is generally found in process and waste storage areas. All thorium detections were within the bounds of uranium contamination and were generally in surface soil. Subsurface contamination is limited to a depth of 10 ft.

The predominant metal contaminants are cadmium and beryllium. All above-background concentrations of cadmium are assumed to be located within the boundaries of uranium contamination. Cadmium is a trace element in the earth's crust and a trace constituent in the uranium ores processed at FEMP.

Beryllium contamination is also primarily within the boundaries of uranium contamination. Beryllium is a trace element in the earth's crust and is a trace constituent in coal and the flyash generated when coal is burned. Low-level beryllium contamination is widespread at FEMP; this is probably due to emissions from the Boiler Plant and dispersion from the coal and flyash piles.

Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs) were detected in select samples taken near all major processing and supporting facilities. Generally, all detections of organic contaminants are assumed to be within the boundary of uranium contamination.

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Area and Volume of Affected Soil

The estimated affected area of soil (both on and off property) with uranium concentrations above the FRL is approximately 7,907 acres or 12.4 square miles. The estimated volume of soil requiring remediation within the Former Plant Area is approximately 1,245,000 cubic yards.

2.2 Perched Groundwater

Nature and Extent of Contamination

Extensive sampling of perched groundwater on the FEMP property identified site-related contamination in and outside the Former Production Area. Refer to Figure A-6 in Appendix A for the approximate limits of the perched groundwater contamination in the Former Plant Area. The highest contaminant concentrations, primarily uranium, are found in perched groundwater under Plants 2, 6, and 9. Contaminated perched groundwater will be remediated by excavating the contaminated surrounding soils.

Area of Affected Perched Water

Soil and perched groundwater located in contamination areas exhibiting high uranium leachability will require excavation to a uranium soil FRL of greater than or equal to 20 mg/kg. Preliminary boundaries of the high uranium leachability for these areas are depicted on Figure A-6. Where the silt/sand material and perched groundwater extend past the boundaries of these areas, the associated soil was identified for excavation to a uranium soil FRL of 20 mg/kg if the 3-D model demonstrated a continual connection.

Soil and perched groundwater located in nonleachable uranium contamination will require excavation to a uranium soil FRL of greater than or equal to 82 mg/kg. Associated contaminated soil and perched groundwater will be excavated to meet uranium soil ALARA levels of 50 mg/kg in these areas, providing the 50 mg/kg ALARA level is within 3 ft of the greater than or equal to 82 mg/kg FRL value.

3.0 3-D Excavation Model

This section provides an overview of the modeling techniques performed in support of the ACD. The model was constructed using EarthVision software, Version 5.0 from Dynamic Graphics, Inc. The discussion here addresses:

- model coordinates and selection of model boundaries,
- methodology for developing the ACD excavation model,
- results of the modeling effort, and
- recommendations for improvements in the model and modeling process for support of Title I and Title II design activities.

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3.1 Data Coordinates and Limits

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After inspecting the data and maps provided by FDF, the model boundaries were established as follows:

Easting:	1,347,500 to 1,351,000 (3,500-ft extents east to west)
Northing:	479,000 to 482,600 (3,600-ft extents north to south)
Elevation:	536.5 to 603.5 ft above mean sea level (MSL) (67-ft extent vertically)

All coordinates are North American Datum (NAD) 83 State Plane Coordinates for Ohio South, Zone 3402.

Additional information regarding the surface and subsurface model geometry is included in Appendix B.

3.2 Conceptual Modeling Approach

A 3-D contamination and extent of excavation model was developed to identify subsurface data gaps to be addressed in project specific plans (PSPs) and to assist in the development of the conceptual design for the Former Plant Area. The model was based on currently available uranium data and an existing stratigraphic profile of the site's glacial till, which is mainly clay with sand and silt lenses that hold perched groundwater. The extent of excavation was modeled for both clay and silt/sand materials at the lower total uranium FRL of 20 mg/kg in soil underlying areas of leachable uranium and at the higher total uranium FRL of 82 mg/kg, or the total uranium ALARA goal of 50 mg/kg, in soil underlying the areas of less leachable uranium. The 3-D model was expanded to include building foundations and basements, as well as subsurface utilities.

The modeling approach for the ACD was prescribed by FDF and included the following 15 steps. Tables B-1 to B-2 and Figures B-1 to B-4 in Appendix B provide the modeling parameters and resultant images from the modeling process.

1. The total uranium sample data were split into separate surface and subsurface data sets. Samples with a bottom sample depth of 1 ft or less were classified as surface samples while all deeper samples (with mid-point sampling depth greater than 1 ft) were classified as subsurface samples. FDF performed this split.

2. The subsurface data set was split into two data sets depending upon whether the sample was taken in an area of silt/sand or clay material. The existing FDF geologic model was used to classify the subsurface samples. FDF performed this classification.

3. Variograms were constructed for each of the data sets from Steps 1 and 2 to determine the extent of horizontal and vertical spatial correlation and to establish search radii for the Kriging process. The sample variograms were fit with a curve consisting of a nugget and an exponential function.

4. The three data sets were Kriged using the search parameters and variogram models identified in Step 3. Ordinary Kriging was used. The Kriging estimates and confidence results in each case were examined and compared to the input data to ensure that the Kriged estimates honored the sample data.

5. Using the FDF geologic model, the two subsurface models (silt/sand and clay Kriged results) were combined into one subsurface model. For example, if a model cell was defined in the FDF geologic model as silt/sand material, then the Kriged estimate for total uranium from the silt/sand subsurface model was assigned to that model cell in the combined subsurface model. The EarthVision formula processor was used for this process.

6. The 2-D Kriged surface model was draped over the surface topography.

7. The combined 3-D subsurface mode from Step 5 was cut with the surface topography at a depth of 1 ft below surface elevation at each x-y location.

8. The draped 2-D Kriged surface model was assigned a thickness value of 1 ft then added to the top of the cut 3-D subsurface model from Step 7.

9. A preliminary building foundation excavation model provided by FDF was used to construct a cutting surface for the combined 3-D model from Step 8. Since the FDF foundation model contained excavation slope set backs from building foundations, the lower most elevation surface at the bottom of each foundation footprint was used to construct a vertical cutting surface, which was used to cut the 3-D model from Step 8. The foundation cut eliminated building foundation voids from the 3-D soil model and subsequent soil volume calculations. EarthVision's Minimum Tension interpolation technique was used to construct this foundation-cutting surface.

10. A topographic map of the Great Miami Aquifer (GMA) surface provided by FDF was used to cut the bottom of the 3-D model. EarthVision's Minimum Tension interpolation technique was used to construct this cutting surface.

11. A subsurface utility map provided by FDF was superimposed on the combined 3-D model.

12. Excavation depths and slope set backs were designed based on the controlling depth of total uranium concentration estimates from the combined 3-D model produced in Step 11 or the foundation excavation surface outlined in Step 9. In areas of high uranium leachability (defined by FDF), excavation surfaces were designed to recover total

uranium concentrations down to 20 mg/kg. This surface was constructed using the Minimum Tension interpolation technique in EarthVision.

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13. The combined 3-D model of estimated total uranium concentrations from Step 10 was cut with the excavation surface designed in Step 12.
14. The remaining estimated total uranium concentrations in the model after the excavation cuts in Step 13 were examined to confirm that all contamination above the appropriate 20, 50, or 82 mg/kg level had been removed.

15. The volumes of contaminated soil removed by the excavation cutting surface were calculated with EarthVision's volume calculation tools. The results are noted in Section 6.2.

3.3 3-D Model Results

Figures A-1 to A-10 included in Appendix A provide a visual representation of the 3-D model.

Figures A-1 to A-5 illustrate some cross-sectional views through Areas 3A, 4A, 3B, 4B, and 5, respectively. Surface and subsurface contamination for 20 mg/kg, 50 mg/kg, 82 mg/kg, 1,030 mg/kg and its interface with silt/sand lenses and the GMA is readily identifiable. The extent of excavation required to remove the contamination and foundations at each section is presented. Review of the 3-D model electronic file reveals some excavation depths are dictated by contamination plumes immediately adjacent to but not within the cross-section.

Plan views on Figure A-6 depict areas of high leachability and sand/silt lenses that were included in the model. Locations are evident in Areas 4A and 4B where the GMA will be breached.

Figure A-7 includes isopach maps for the excavated soil and the remaining till thickness after excavation.

The surface model Kriging variance is presented on Figure A-8.

Figure A-9 includes a plan view of the residual contamination and sand/silt lenses following excavation of the Former Plant Area. Isometric views of the post excavation surface and remaining data samples are provided. The views clearly illustrate that the contamination within the areas of high leachability soil has been removed.

Figure A-10 includes a fence diagram composed of the cross sections established on Figures A-1 to A-5.

3.4 Recommendations for 3-D Model Improvements

The modeling approach used for the ACD was consistent with previous block modeling activities used at FDF for estimates of contaminated soil volumes. As additional data are acquired and modeling techniques are refined, the following recommendations are made for improvements in the modeling process and model results to support Title I and Title II design activities:

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- The original geologic model warrants adjustment for changes in surface elevations that have occurred on site since the ACD model was built.
- Actual foundation data from as-built drawings should be used in future modeling efforts to provide more detail and higher resolution of actual building foundation limits and elevations.
- Model data points for utilities should be refined. Some model points were missing or were inconsistent with drawings provided in support of this modeling effort.
- Detailed models should be constructed for each of the individual areas in the Former Plant Area (i.e. 3A, 3B, 4A, 4B, and possibly 5).

4.0 Excavation Issues and Objectives

This section addresses excavation issues and objectives that should be fully developed as part of the remedial design activities. The key issues include site radiological control, dust control, stormwater control, perched groundwater control, excavation dewatering, deep foundation removal, and groundwater monitoring well management.

4.1 Site Radiological Control

Requirements for working in the areas containing radiological contamination will be performed in accordance with 10 *Code of Federal Regulations* (CFR) 835. The work will be performed in accordance with the DOE- approved Radiation Protection Program applicable to the Fernald site or under the U.S. Nuclear Regulatory Commission (NRC) Agreement on State Radioactive Materials License.

FDF will be responsible for providing radiological control technical staff equipped with survey and air sampling instrumentation. Boundary control stations equipped with personnel monitoring equipment and change facilities will be provided.

Workers will be required to complete Radiological Worker Training, Hazardous Waste Operations and Emergency Response Training, as well as other site-specific training.

Worker protection will include personnel monitoring, respiratory protection, and bioassay requirements.

The radiological limits that will be followed for the project are found in Table 4-1 and Table 4-2. The Tables were taken from the FDF Procedure "Radiological Posting and Access to Radiological Areas, Document Number RP-0007, PCN Effective Date: 12-07-98."

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Table 4-1
Surface Contamination Limits [a]

Nuclide[f]	Fixed Plus Removable		Removable [b, e]
	Average [b, c]	Maximum [b, d]	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm/100 cm^2	15,000 dpm/100 cm^2	1,000 dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission) except Sr-90 and others noted above	5,000 dpm/100 cm^2	15,000 dpm/100 cm^2	1,000 dpm/100 cm^2

a. Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

b. As used in this table, disintegrations per minute (dpm) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

c. Measurements of average contaminant should not be averaged over more than 1 m^2. For objects of less surface area, the average should be derived for each object.

d. The maximum contamination level applied to an area of not more than 100 cm^2.

e. The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface are is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

f. The limits presented for transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, and Ac-227 are taken from Information Source 9.3.2. Consult with Radiological Control when required to apply these limits for unrestricted release.

Table 4-2
Derived Air Concentrations (DAC)[1]
for Posting Airborne Radioactivity Areas at the FEMP[2]

Nuclide	µCi/ml	Lung RetentionClass[3]
U-238	2 E-11	Y
Th-230	3 E-12	W
Th-232	5 E-13	W
Ra-226	3 E-10	W

Rn-222 (Radon) decay products 0.33 working level
Rn-220 (Thoron) decay products 1.0 working level

1 From Appendix A of 10 CFR 835

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[2] The DACs shown are for the most limiting solubility class for 1 µm Atmospheric Mass and Density particle size. Contact Radiological Control for assistance in determining DAC values for differing conditions.
[3] Lung Rentention Class: W (weeks), Y (years)

4.2 Dust Control

The project will develop a project-specific procedure or plan for controlling fugitive dust emissions to ensure compliance with standards and negotiated site-specific limits defined in "Fugitive Dust Control Requirements, RM-0047." The procedure or plan shall include, but not be limited to, how project field activities will be monitored for fugitive dust releases, what methods will be used to control fugitive dust releases, what records will be kept and maintained, and what notification process will be used after discovering fugitive dust releases.

These dust control mechanisms shall be based on the fugitive dust control/work practice Best Available Technology (BAT) Policy as approved by the Ohio Environmental Protection Agency (OEPA) and defined in the Ohio Revised Code 3704.01(F).

OEPA must approve the BAT dust controls/work practices to be implemented. Some BAT dust control/work practice strategies include:

- application of dust suppression or crusting agents to prevent dust generation in a manner that prevents migration of the agents beyond the work area boundaries, ponding, or disruption of other portions of work;
- wheel wash (optional) at the excavation site before entering any defined paved roadways;
- removal of clods, clumps, tracks, or visible deposits of soil, mud or other materials that could readily become visible fugitive emissions from paved and treated unpaved roadways/parking areas.

4.3 Stormwater Control

Surface water management systems and erosion control measures will be designed using the appropriate guidance in the Ohio Department of Natural Resources, Rainwater and Land Development (ODNR 1996), engineering judgement, and experience from earlier phases of remediation. Surface water management systems will be designed to divert stormwater runoff from upgradient areas around excavations, collect runoff from areas that will be disturbed during excavation/remediation, convey water to appropriate facilities, and provide the necessary and appropriate control and/or treatment facilities. Erosion and sediment control components will be selected and used in general conformance with applicable code and procedure requirements.

An existing open channel is located along the northern perimeter of the Former Plant Area immediately south of the railroad yard. This channel intercepts surface water runoff from the northern reaches of the FEMP and drains westward to Paddys Run. In addition to the open channel, a concrete channel extends along the north boundary of Area 3A and Area 3B and will be used to prevent surface water from leaving the north side of Areas 3A and 3B. Water collected by the concrete channel will divert into the water collection systems for proper treatment.

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In addition to the existing channels, stormwater management controls will be provided as part of site preparation activities. These measures will be installed to control surface water runoff/run-on, to minimize discharges of potentially contaminated surface water during remediation, and to minimize potential recontamination of remediated areas. These controls will be monitored and may be modified during construction. Surface water management control facilities will be designed for each remediated area. Generally, diversion dikes/ditches will be designed and installed along the area boundaries of each remediation area to control run-on and runoff.

Excavations required to remediate these areas could stay open up to 6 months or more. During these periods, water is expected to accumulate within the excavations as a result of precipitation. Surface run-on into the excavations will be limited to the extent practical by the use of berms, dikes, or ditches. Within the excavation, open sumps and pumping will be used to collect surface water. This accumulated water is likely to be contaminated due to contact with non-certified excavation surfaces and will require treatment prior to discharge off-site.

Stormwater collected inside the project boundary will be sent for Phase I or II treatment at the AWWT facility. The majority of the surface water runoff collected will be routed to the Stormwater Retention Basin (SWRB) via the storm sewer system. Surface water mixed with groundwater containing VOCs and SVOCs will require Phase II treatment and will be transferred to the Water Management Facility (WMF) and/or the Biodenitrification Surge Lagoon (BSL) before being treated.

The FEMP maintains a stormwater collection system that includes conveyance systems and retention basins. According to the SEP, this system is designed for a 10-year, 24-hour storm event. This system can prevent most stormwater from entering the Storm Sewer Outfall Ditch and Paddys Run. As remediation of the site progresses, the stormwater collection system will be decommissioned in stages to ensure continued stormwater collection from the portions of the site not yet remediated. To the extent practical, surface water discharges from the area being worked will be conveyed via pumping or other appropriate methods to the adjacent area where the conveyance system is still intact. Once an area is certified clean, surface water runoff from that area will be diverted so that it is routed directly to any confluence leading to the Great Miami River.

Erosion and sediment control measures will be provided as part of site preparation. The erosion and sediment control measures must be appropriate for the area of remediation and must be clearly transferred from the conceptual basis to the detailed design while maintaining the constructability of the remediation activity. For this project, appropriate erosion and sediment control measures will be implemented to mitigate sediment loading to the existing storm sewer system and, where appropriate, to protect downgradient areas. Typical types of erosion and sediment control will include silt fencing, check dams, sediment traps, temporary seeding, permanent seeding, and/or crusting agents. Erosion and sediment system control measures will be selected and used in general compliance with applicable codes and procedures. These measures will be designed for each remediated area.

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4.4 Perched Groundwater Control

Perched groundwater controls will be provided as part of site preparation. These controls will consist primarily of open sumps and pumping within the excavations, supplemented with parallel interceptor trenches at selected locations. Due to the known perched groundwater conditions, planning the sequence of excavations to accommodate dewatering is necessary. Sumps and parallel interceptor trenches may be required. The following present two potential excavation sequences that will be considered for excavations encountering perched groundwater.

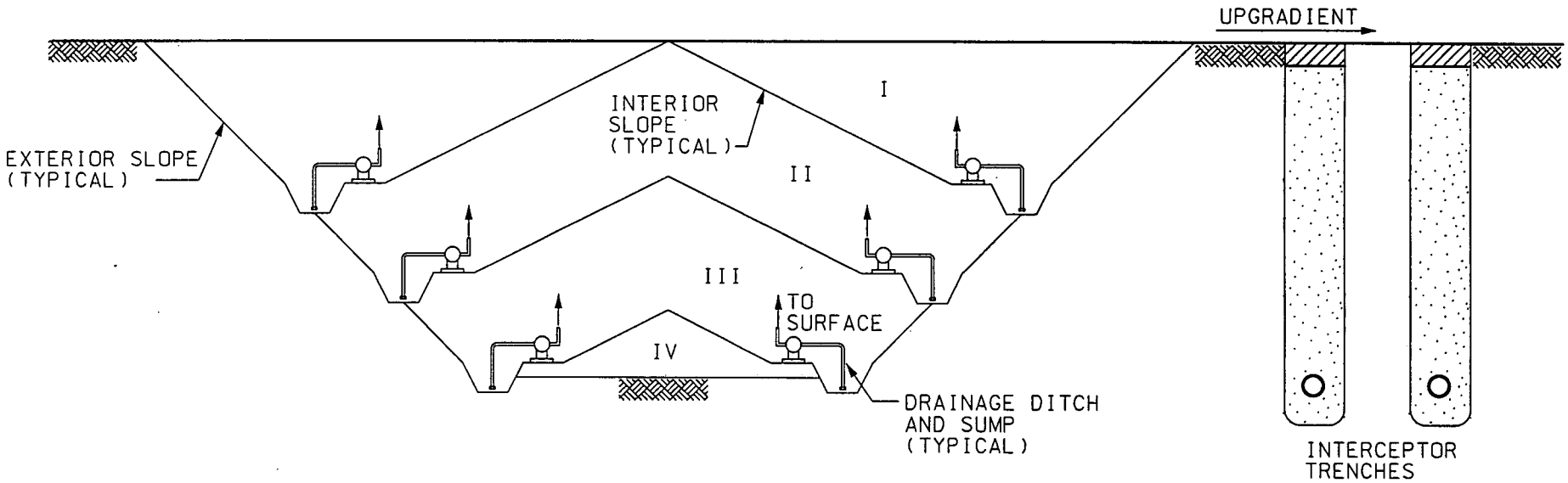
Excavation Sequence 1: This involves installation of parallel interceptor trenches on the upgradient side of the excavation. The excavation begins around the perimeter of each area and is extended inward and downward. This method will act as a dewatering system on both the upgradient and downgradient sides of the excavation. Open sumps and pumping will be used around the perimeter of the excavation. Figure 4-1 provides a general illustration of Excavation Sequence 1.

The advantage of this sequence is that the sump location is always at the same location (along the perimeter). In addition, the center portions of the excavation will remain drier, which should facilitate excavation and subsequent placement of excavated material at the OSDF. The interior slopes could be kept flatter than the exterior working slopes, which could act as access routes and make hauling excavated material easier. Disadvantages include water collected at the toe of the slopes that may lead to sloughing or localized slope failures. Parallel interceptor trenches can be installed to aid in dewatering since open sumps and pumping may not entirely control perched groundwater in localized high flow situations.

Excavation Sequence 2: This involves installation of parallel interceptor trenches upgradient of the excavation. The excavation begins on one side of the area proposed to be excavated and is progressively extended deeper and wider with the interior slopes flatter than the exterior working slopes. Open sumps and pumping will be used on the side where the excavation began (i.e., at the base of the exterior working slopes). This method will dewater the downgradient side of the excavation and any water that remains on the upgradient side. Figure 4-2 provides a general illustration of Excavation Sequence 2.

The primary advantage to this sequence is that a portion of the excavation will remain dewatered throughout the excavation process, which facilitates the ease of equipment use. This sequence also has the advantage of a flatter slope on the downgradient side of the excavation, which will allow the equipment to access the excavation more easily and prevent disturbance to the working slope. The major disadvantage is that open sumps and pumping will be located at the toe of the exterior slopes, which may undergo sloughing failures and possible localized slope failures. These failures will require maintenance throughout the project.

Regardless of the excavation sequence, the main problems that will be encountered during excavation are related to perched groundwater. The anticipated problems include shallow sloughing failures along slopes, keeping open excavations dry, disturbing silty or sandy materials



NOTE:

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FIGURE 4-1
EXCAVATION SEQUENCE 1

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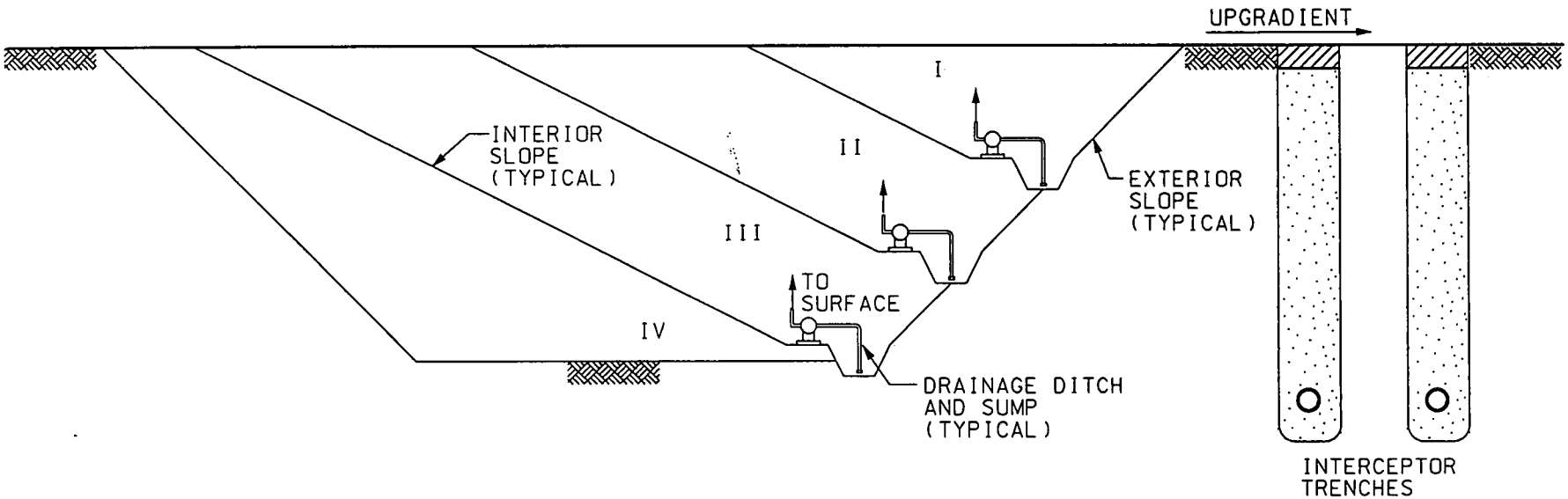

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FIGURE 4-2
EXCAVATION SEQUENCE 2

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with construction equipment, and providing a stable foundation. To minimize problems associated with excavations, the excavations will have no greater than 2H:1V slopes. Equipment and material will not be placed near the edges of the excavation, with the exception of diversion dikes that serve to keep surface water runoff from entering the excavation. Also, the base of the excavation will be positively drained to one or more open sumps to provide a stable foundation. Standard excavation equipment will be able to excavate the materials.

Several alternatives can be employed to remove and collect groundwater within the glacial overburden perched above the water table of the GMA. Perched groundwater control alternatives consist of the following: open sumps and pumping, interceptor trenches, and dewatering wells. One or more of these alternatives will be used to remove contaminated perched groundwater for treatment and to maintain the working area as dry as possible.

Perched groundwater and stormwater that collects in the uncertified excavation area will be conveyed to the AWWT for Phase I or Phase II treatment. Phase I treatment is required for all stormwater and perched groundwater in noncertified areas when VOCs are absent. Phase II treatment is necessary for perched groundwater and stormwater that contains VOCs or SVOCs. Figure 4-3 shows the general collection and treatment routes for the collected perched groundwater and stormwater.

Perched groundwater and stormwater that collects in the excavation will be pumped to a sediment trap and then to the storm sewer system or to the WMF, which is being constructed in the excavation left by removing material from the lime sludge ponds. Subsequent discharge from WMF will be to the SWRB or BSL for AWWT Phase I or II treatment, respectively. The total suspended solids loading target for collected water will be 1,000 parts per million (the same as established for that of surface water being sent to the SWRB). If possible, project piping will be located for use during the remediation of more than one area without major modification.

The particular dewatering method to use in the active excavation depends on the potential water yield from all sources, the depth and area of the excavation, and the location of the excavation in relation to unexcavated areas. Because of the presence of perched groundwater and the noted variability of its hydraulic conductivity, it is possible that a variety of predrainage techniques will be needed (e.g., open sumps and pumping and interceptor trenches).

Open Sumps and Pumping

This method uses shallow trenches (less than 4 ft deep) along the outer edges of the excavation to collect the perched groundwater and convey it to shallow sumps, where it is pumped from the excavation and sent to the nearest stormwater sewer or WMF, depending on the treatment option. Figure 4-4 illustrates the open sumps and pumping method.

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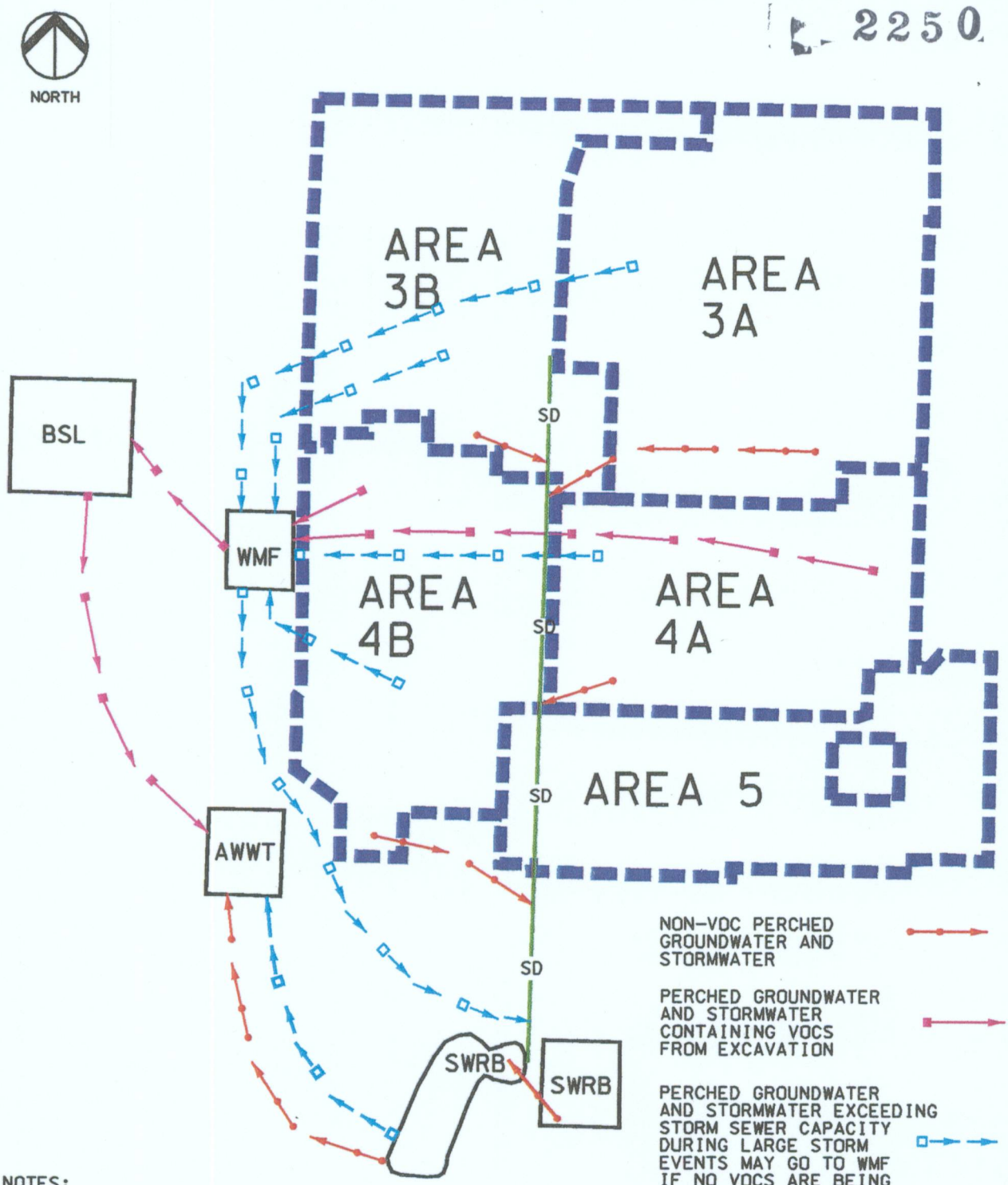

NOTES:

1. ALL VOC PERCHED GROUNDWATER AND STORMWATER GOES TO THE WMF.
2. PERCHED GROUNDWATER AND STORMWATER WITH NO VOCS MAY BE TEMPORARILY STORED AT THE WMF AND DISCHARGED TO THE SWRB.

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FIGURE 4-3
PERCHED GROUNDWATER AND STORMWATER ROUTING

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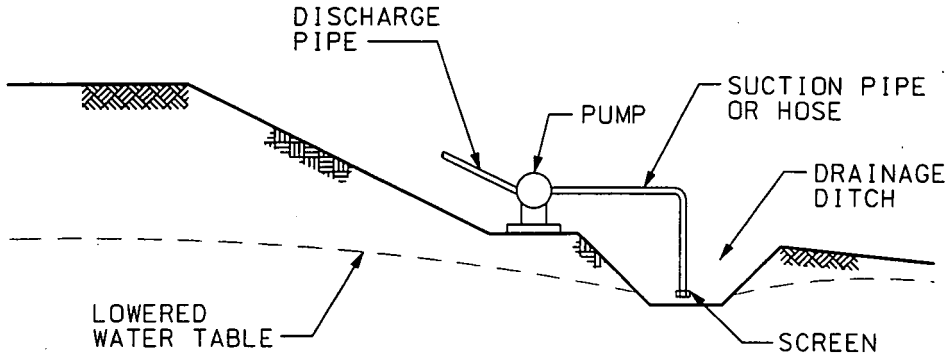

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FIGURE 4-4
OPEN SUMPS AND PUMPING

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Pumping from open sumps within the excavation is a proven and reliable method when groundwater volumes are relatively low and recharge is nominal. Materials and equipment are readily available. Both the capital costs and operation and maintenance (O&M) costs are relatively low when compared to other methods. Although open sumps and pumping is relatively inexpensive, handling power cables, pumps, and discharge lines within the excavation and on the slopes can be a nuisance.

Interceptor Trenches

Figure 4-5 illustrates the interceptor trench method. This seepage-reducing method is desirable in its ability to cut off the flow of perched groundwater and reduce the volume, either as the sole method of control or in conjunction with other drainage methods. Interceptor trenches, commonly referred to as French drains, are excavated to the depth necessary to intercept the perched groundwater, and a perforated pipe is placed and surrounded with free-draining stone or sand and covered with 1 to 2 ft of impervious material (i.e., clay). Perched groundwater intercepted in the trench is carried by gravity or collected in a sump and routed to the SWRB or BSL.

Use of interceptor trenches is a proven and reliable process. Materials and equipment are readily available. Capital costs are moderate, while O&M costs are low.

Dewatering Wells

Dewatering wells are filtered wells (i.e., sand filter surrounding the well casing) that can be installed with vertical pumps capable of handling virtually any quantity of water encountered in excavations (Figure 4-6). Pumps are available in a wide range of discharge rates, powered by electricity, gasoline, or diesel. Individual wells vary in diameter, depending on installation needs. Well systems have the advantage of being quite flexible. An initial group of wells can be installed and pumped, and the groundwater lowering observed. If sufficient control is not obtained, additional wells can be installed until the required lowering is obtained.

Wells often must be constructed so that they can remove large volumes of water without allowing large quantities of soil to enter the well casing. A sand filter is required when the soil consists of very fine sand, silt, or stratified formations containing layers of fine sand and silt (such as described for the project site). The well is constructed sufficiently large in diameter to allow carefully specified filter material to be placed around the perforated or slotted pipe. If large production is required, special care must be taken to use material with sufficiently high permeability so that flow into the well is not restricted.

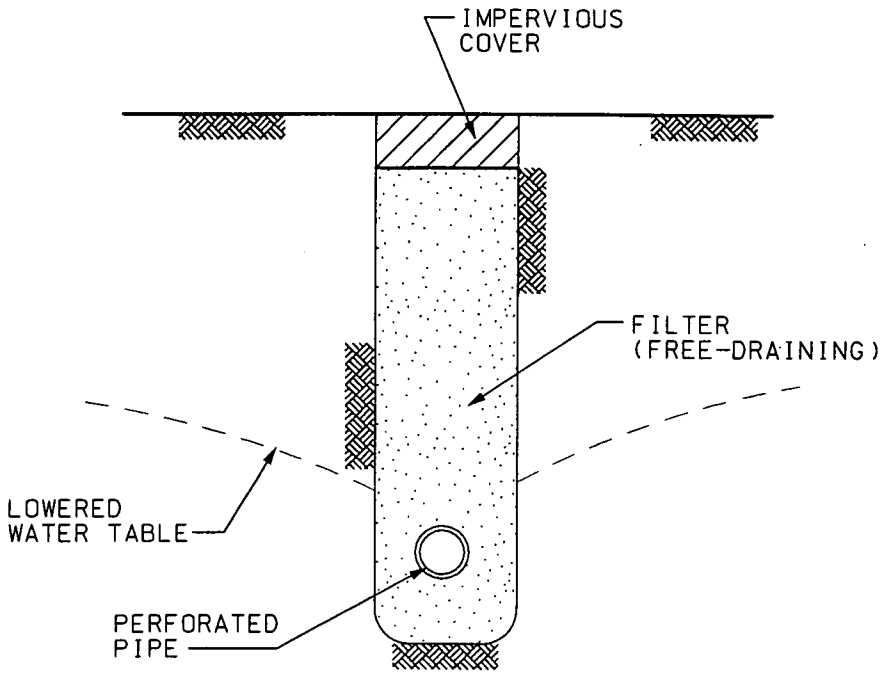

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FIGURE 4-5
INTERCEPTOR TRENCH

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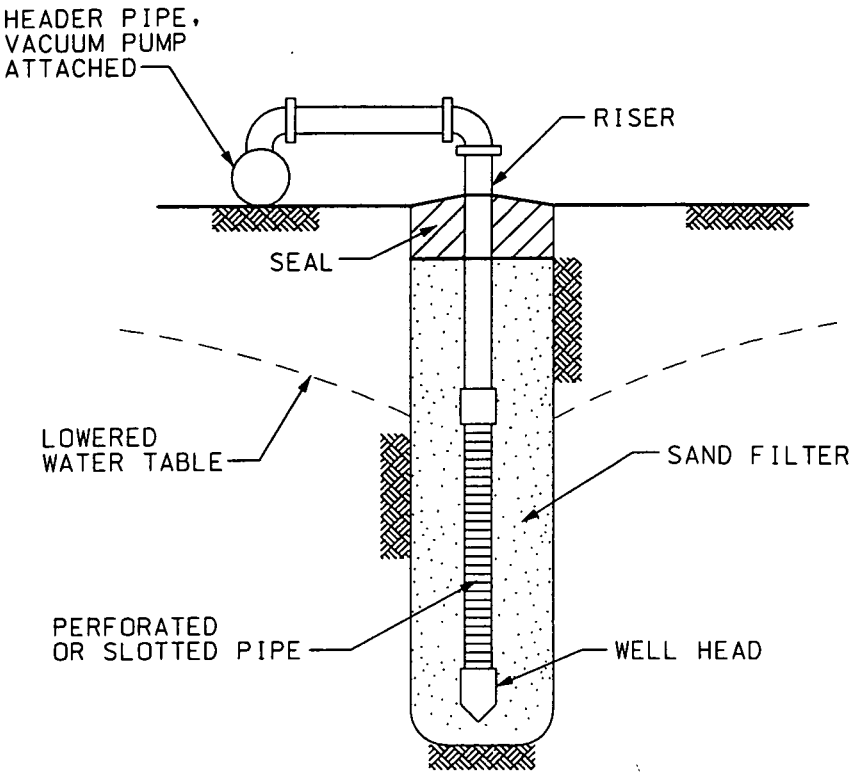

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FIGURE 4-6
DEWATERING WELL

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Dewatering wells are a proven and reliable method for removing groundwater. The construction of dewatering wells is relatively simple, and materials are readily available. Capital costs for individual wells are relatively low to moderate; O&M costs are moderate. In addition to installation and O&M costs, perched groundwater removed via dewatering wells will be sent to the SWRB or BSL before treatment at AWWT. As stated in the Geotechnical Engineering Report (DOE 1998b), relatively close spacing of dewatering wells would be required due to the small radius of influence expected within the silt and fine sand of the perched groundwater zone. Therefore, due to the anticipated close spacing of dewatering wells, this method is probably not ideal for controlling perched groundwater. Also, for excavation greater than 15 ft, the dewatering wells will have to be staged, resulting in higher costs.

Potential Perched Water Yield

According to the Geotechnical Engineering Report (DOE 1998b), the perched groundwater flow rates will be low [i.e., the peak seepage yields are less than 1.25 gallons per minute per foot (gpm/ft), the sustained seepage rates are less than 0.08 gpm/ft], and open sumps and pumping will be the most common method for controlling perched groundwater. In any event, these systems will be needed for stormwater control.

Summaries of hydraulic conductivity are included in the SEP (DOE 1998a). The silt and fine sand materials in the glacial overburden at FEMP are typically medium dense to dense, well-graded, poorly sorted sands and silts, often with clay-sized materials. The fine-grained materials are glacial till with a significant clay fraction. Estimates of the peak and sustained yields were presented in the Geotechnical Engineering Report (DOE 1998b). According to this report, the lowest anticipated yield will come from the northeast area of the project site (i.e., general location of Area 3A). The highest anticipated yield will come from the southwest area of the project site (i.e., general location of Area 4B). Several reports on the hydrogeologic conditions provide data suggesting recharge is from precipitation that falls directly on the Former Plant Area and the watershed area north of the plant.

Perched Groundwater Management in Excavated Areas

The size and depth of excavation varies widely for each of the remediation areas of the Former Plant Area. The size and depth of the excavation is shown on Figure A-7.

For deep excavations (greater than 10 ft deep below the existing ground surface), the excavated area will be relatively small and excavation should be sequenced to minimize mixing of perched groundwater from different stratigraphic levels. The excavated area will be gravity drained to one or two sumps. Perched groundwater containing VOCs or SVOCs near Plants 2, 6, and 9 will be pumped to the WMF before discharge to the BSL and Phase II treatment. All other water will be transferred to the SWRB.

For shallow excavations (less than or equal to 10 ft deep below the existing ground surface), the excavated area will be relatively large and excavation will need to be sequenced to effectively dewater the working area. The excavation will be gravity drained to one or more sumps, and the collected water will be routed to SWRB or WMF.

Within individual remediation areas, there are potential RCRA soil areas as well as materials that have the potential to exceed the OSDF WAC. The potential RCRA and potential above WAC material volumes anticipated to be excavated generally lie in the top 3 ft of soil and perched groundwater is not likely to be a major issue.

Perched Groundwater Management in Unexcavated Areas

Perched groundwater recharge results from the precipitation that falls directly on the Former Plant Area and the watershed area north of the plant. Perched groundwater north of the site is not contaminated. To reduce the amount of perched groundwater that flows through the contaminated areas, this perched groundwater could be intercepted and discharged to surface water flowing to Paddys Run. An interceptor trench could be installed along the north and east edges of the site and this would be one of the most effective means with which to collect this clean water. However, using an interceptor trench in this manner can also draw the perched groundwater from the contaminated areas into the interceptor trench. Therefore, two interceptor trenches would be installed parallel to one another to minimize the cross-contamination of the clean perched groundwater. In other words, an upgradient trench would intercept clean water for discharge directly to the Storm Sewer Outfall Ditch, and a downgradient trench will intercept contaminated water for discharge into the storm sewer system.

4.5 Excavation Dewatering

During excavation for the remediation activities, removal of perched groundwater and surface water runoff will be accomplished using open sumps and pumping methods. Contingencies should also be made for additional means of dewatering, particularly in excavations in the northeast quadrant of the Former Plant Area. Such contingencies may include installation of parallel interceptor trenches.

To minimize slough and heave of the soils at the base of the excavation, pumping from open sumps and interceptor trenches should continue until the excavations are developed to final planned grades or backfilled at least 2 ft above the maximum observed seasonal groundwater elevations.

Even with the aforementioned measures, there is excavated soil that will require additional dewatering. Soil containing free liquids cannot be transported to the OSDF or the SP-7/Area 7 Above WAC Storage Area. Therefore, dewatering areas will be established in each excavation area using existing building pads or otherwise prepared areas. The dewatering areas will be cordoned off, lined with impervious material, and positively drained such that water seepage can be collected for treatment.

4.6 Deep Foundation Removal

Deep foundation removal alternatives include demolition and removal of deep subsurface concrete walls, slabs, grade beams, and deep piling. Several buildings in the remediation area have pile foundations that extend to a considerable depth below grade and below any known soil contamination. The pile foundations for Building 10A (Boiler House) extend approximately 40 ft below the grade, and the multi-level basement extends at least 30 ft below grade. Because of

these depths, none of the pile foundations are expected to be readily removable. If the piles can be removed, the sands of the GMA will collapse as the piles are removed, and this could provide an enhanced pathway for contaminant transport into the GMA. Therefore, each deep piling will be addressed on a case-by-case basis.

Factors to be considered when deciding to remove a piling or leave it in place include:

- technical difficulties in removing the piling,
- process knowledge about the mobility and quantity of potential contaminants,
- analytical results from soil borings surrounding the piling, and
- final grade of the excavation.

Prior to deep foundation removal, the soil material adjacent to the foundation will be removed. The material will be removed by either conventional excavation with a safe slope or by first installing vertical sheet piling followed by soil removal. Based on the proposed sequencing and location of adjacent structures, vertical sheet piling is not currently anticipated.

Removal alternatives that may be used to remove the deep piles and/or other subsurface concrete foundation material include the following:

- saws,
- diamond wire cutting,
- subsurface explosive cutting,
- flame cutting,
- thermite reaction lance,
- abrasive water jet,
- subsurface controlled blasting,
- wrecking ball,
- excavator-mounted attachments, and
- expansive grout.

One or more of these alternatives may be used for surface and subsurface concrete removal. Other alternatives may be introduced as the need arises. Ease of operation, efficiency, and safety will be the main drivers for deep foundation removal efforts. The primary alternative used will most likely be the excavator mounted attachments which include a pneumatic hammer, jaw-crusher, and a shear. As part of the detailed design activities, these, as well as other alternatives will be evaluated for safety, technical effectiveness, and cost-effectiveness.

4.7 Groundwater Monitoring Well Management

Monitoring wells located at each of the remediation areas will be properly plugged and abandoned or excavated, as appropriate, to facilitate remedial activities. The schedule for plugging and abandoning the wells will be based on area-specific requirements and will be conducted in accordance with existing site procedures.

Soil excavation may extend to a depth where 1,000-series wells can be removed intact during excavation, without implementing normal plugging and abandonment procedures. Well removal will be coordinated with the Aquifer Restoration Project to maintain the integrity of the existing groundwater monitoring program.

The Integrated Environmental Monitoring Plan (IEMP) describes the existing groundwater monitoring program and identifies the monitoring wells to be maintained during remedial activities. These wells will receive protective measures, such as construction fencing, to ensure they are physically protected during field activities. New monitoring wells may be installed in some areas after the completion of excavation activities to ensure appropriate groundwater monitoring data are generated under the IEMP (DOE 1997) groundwater monitoring program.

4.8 Remedial Objectives

The overall goal of soil remediation is to remove soil that presents an unacceptable risk to human health and the environment. Principal remedial objectives are to remove the contaminated soil in a cost-effective and efficient manner, protect human health and the environment, and provide the proper ratio of bulk materials to the OSDF, while maximizing Category 1 (soil or soil like) material. The sequencing objectives are applicable within project areas as well as between areas.

During remediation, procedures will be implemented to protect human health and the environment by minimizing potential exposure to contamination and avoiding cross-contamination. This will be achieved by:

- excavating areas from upgradient to downgradient with respect to perched groundwater and surface water flow;
- controlling haul routes through contaminated areas to minimize cross-contamination of certified clean areas; and
- using paved roads, to the extent practical, to minimize dust generation and avoid cross-contamination.

Steps will also be taken to make the sequencing cost-effective and efficient. These steps include:

- Minimize double handling of material.
- Establish large work areas to provide efficient equipment utilization.
- Minimize haul distances.

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- Minimize unnecessary water treatment.
- Haul soil directly to the OSDF when necessary.
- Never stockpile soil in post excavated areas.
- Stockpile soil close to the excavation area when necessary.
- Stockpile soils in areas of like uranium FRLs when necessary.
- When stockpiling soils in areas with differing uranium FRLs, storage duration should be brief or the stockpiled material should be separated from the underlying soils by Geotextile or other separation layer.

The remediation goals established for soil excavation activities at the FEMP include (1) WAC attainment, (2) FRL attainment, (3) hot spot attainment, (4) RCRA-characteristic-waste compliance, (5) hazardous waste management unit (HWMU) closure, and (6) underground storage tank (UST) closure. These goals are expected to be met when the Certification Design Letter (CDL) is submitted and will be verified when the Certification Report is issued.

The objective of WAC attainment is to provide an acceptable level of confidence that the WAC for the OSDF has not been exceeded. For the soil remediation activities, WAC attainment will be demonstrated with RI/FS data, predesign characterization data, real-time excavation-control monitoring of gamma radioactivity and organic vapor levels, and verification that excavations were carried out in accordance with design specifications.

Another goal of the soil remediation activities is to certify that the average residual contamination of any COC is at or below its respective FRL. The general approach for demonstrating attainment of FRLs is to identify locations where contaminant concentrations exceed the FRL of any area-specific COC, remove that material for disposition in the OSDF, and certify, with a specified level of confidence, that the average residual concentration of each COC is below its respective FRL.

FRL attainment will be demonstrated using RI/FS and predesign characterization data, postexcavation sodium iodide surveys and high purity germanium detector (HPGe) measurements, physical certification samples, and verification that the excavations were carried out in accordance with design specifications. FRL attainment for uranium, thorium, and radium (i.e., primary COCs) will also be demonstrated with mobile radiation tracking system, radiation scanning system, and/or HPGe measurements during precertification activities conducted before the sampling and analysis activities associated with the final certification process.

Hot spot attainment goals can be accomplished using the same in situ scanning technology used for FRL attainment. The real-time capability allows field survey teams to look for hot spot activity during precertification activities. Scanning as much of the remediation surface as possible will reduce the possibility that radiological hot spots are missed.

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RCRA characteristic waste compliance will be accomplished by either in situ treatment of the characteristic materials prior to the OSDF disposal, excavation followed by on-site treatment and disposal at the OSDF, or excavations for off-site treatment and disposal. Excavated RCRA material will be containerized and placed on the Plant 1 Pad or an equivalent approved RCRA storage facility before disposal.

Closure of a HWMU will be accomplished by documenting that the constituents for which the waste managed on the unit were deemed hazardous, and for which the unit itself was declared a HWMU, are below established site-specific FRLs in soil remaining in the HWMU footprint. The CDL for a soil remediation area will address each of the HWMUs contained therein and the specific sampling and analysis required to demonstrate soil FRL attainment and closure.

Closure of USTs are accomplished through the demonstration of soil FRL attainment and completion of closure in the same manner as that used for HWMUs. Completion of UST closure under the soil remediation activities will document that the hazardous constituents of its former contents are below established site-specific FRLs in soil remaining in the UST footprint.

5.0 Waste Management Planning

This section addresses project waste management issues that should be fully developed as part of the remedial design activities. The key issues include waste types, treatment alternatives for potential RCRA materials, waste segregation, waste minimization, and site radiological controls.

5.1 Remediation Waste Streams

Based on FEMP site history, process knowledge, and remedial investigation/feasibility study (RI/FS) data, most remediation activities will be driven by uranium, radium, and/or thorium concentrations Remediation of contaminated areas may also be driven by technetium-99, RCRA toxicity characteristic soil, HWMU and/or UST area remediation.

Numerous areas have been identified in the SEP that may require special consideration for waste segregation, treatment, or disposal. These areas include three potential locations for technetium-99; four locations for RCRA toxicity characteristic soil; nine locations with uranium potentially above the soil WAC; and two locations with VOC contamination in perched groundwater, as well as numerous HWMU areas and UST locations that may require excavation. Descriptions of the HWMU and UST areas are summarized in the SEP. All other remediation areas are currently classified as having COCs below WAC and will be placed at the OSDF for disposal. Predesign characterization activities may identify additional areas that require special segregation, treatment, or disposal. The potential exists to encounter unexpected above WAC and potential RCRA material during below WAC excavation activities. If these materials are found, they will be excavated and placed in the SP-7 or Area 7 Above WAC Storage Area and/or the Plant 1 Pad.

All remediation waste streams having COCs below WAC will be classified into one of five engineering-based categories. These categories were developed in consideration of the techniques and procedures that will be used to place the waste to achieve desired compaction and configuration requirements at the OSDF.

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The five categories include:

- Category 1 — Impacted materials that are soil and soil-like.
- Category 2 — Impacted materials that can be handled *en masse*, are no more than 18 inches high and 10 ft long, and are expected to be moderately compactable.
- Category 3 — Impacted materials that must be individually handled and placed in the OSDF, are suitable for having Category 1 material placed around and against them, have a nominal height of no more than 4 ft, are regularly shaped, and are essentially incompactable using standard compaction equipment.
- Category 4 — Impacted materials that are high in organic content (i.e., it will decompose) and/or very compressible.
- Category 5 — Impacted materials that require special handling due to their special nature.

5.2 Treatment Alternatives for Potential RCRA Materials

The OU 5 RI/FS program at the FEMP identified seven geographic areas on the FEMP site where the potential exists for soil that qualifies as RCRA toxicity characteristic waste. Four of the areas are located in the Former Production Area. This potential for the presence of toxicity characteristic hazardous waste was identified using validated soil data to identify COCs with concentrations that exceeded 20 times the maximum allowable concentration derived from the toxicity characteristic leaching procedure (TCLP) limits. Based on the results of this evaluation and ongoing characterization activities, approximately 4,000 cubic yards of materials may contain COCs that warrant classification as toxicity characteristic hazardous waste. The four locations at the Former Production Area are:

- area located on the northeast corner of the KC-2 warehouse, Building 63-lead,
- scrap metal pile area in the northeast corner of Area 3A-lead,
- area located north of the Maintenance Facility Building 12A-trichloroethene (TCE) and,
- abandoned sump west of the Pilot Plant, Building 13A-barium.

Ongoing characterization sampling will determine the final volumes of potential RCRA materials for these areas.

The OU 5 ROD stated that the U. S. Environmental Protection Agency (EPA) corrective action management unit (CAMU) rule is an applicable or relevant and appropriate requirement for determining treatment and on-site disposal requirements for RCRA-related constituents. DOE, EPA, and OEPA agree that the toxicity characteristic waste streams found in the four areas identified here offer a reasonable opportunity to apply cost-effective levels of treatment before disposal off site or at the OSDF.

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Additional field investigations are currently underway or are being planned to facilitate additional TCLP testing that will determine actual volumes of potential characteristic waste and assist in the economic-based decisions regarding treatment strategy and location. To obtain cost-effective methods for treating the different types of RCRA waste, the following must be considered:

- volume of waste materials to be treated,
- time needed to treat the material,
- whether it is a proven technology and commercially available, and
- unit costs for treatment.

Depending on the treatment method, the waste soil could be treated in situ; excavated, containerized, and delivered to a central location for treatment; or transported off site for treatment and disposal.

Viable technologies for treating the potential RCRA toxicity characteristic soil were specified in the OU 5 ROD. The technologies cited included EPA-approved stabilization technologies for inorganic constituents and low temperature thermal desorption techniques for organic constituents. In this ACD, the following treatment technologies have been screened for their ability to treat inorganic and organic constituents: solidification/stabilization (S/S) and electrokinetic technology for the treatment of the lead and barium contaminants and thermal desorption for the TCE-contaminated materials. Remedial design efforts will provide the details of (1) statistical and testing protocols necessary to establish representative soil volumes requiring treatment, (2) treatment processes to be employed, and (3) procedures for verifying the treatment's effectiveness. Based on the results of these studies, a cost benefit analysis will be performed to determine the viability for on-site treatment and disposal versus off-site treatment and disposal.

Lead- and Barium-Contaminated Areas

The current volume estimate for lead and barium contaminated soil is approximately 3,800 cubic yards. Over 95 percent of this volume is associated with lead contamination in Area 3A. This potential RCRA material may be treated in situ or ex situ by S/S or electrokinetic technology.

S/S is a treatment technology designed to reduce contaminant solubility through chemical changes and/or physical encapsulation into nonreactive species. These treatment technologies are used to treat sludge, sediment, and soil contaminated with metals (including RCRA metals) and radionuclides.

In solidification, a reagent is added to transform the waste into solid-like material. Wastes that exist as liquids or semisolids are often solidified to improve the handling and physical characteristics. The chemistry of the waste is not necessarily modified by solidification; however, the solidified matrix may microencapsulate the waste.

In stabilization, a reagent is added to transform the hazardous constituents in the material into their least mobile and/or toxic form. Wastes susceptible to leaching of heavy metals or other contaminants are often stabilized to immobilize the hazardous constituents.

S/S of solids can be accomplished by using binding agents. The S/S binding agents consist of cement-based materials, pozzolanic-based materials, and natural materials such as clay and other proprietary reagents. This technology is commonly applied ex situ. However, in situ applications are feasible through the use of various proprietary augers that provide reagent delivery and mixing.

Cement-based materials consist of Portland cement and soluble silicates. These materials chemically react with water to form a solid cementious matrix, which improves the handling and physical characteristics of the waste. They also raise the pH of the waste, which helps to precipitate and immobilize some heavy metal contaminants. Cement-based binding agents are typically appropriate for inorganic contaminants.

Pozzolonic-based materials generally form a cementious bond in the presence of water and consist primarily of silica from flyash, kiln dust, pumice, or blast furnace slag, and lime. Pozzolonic-based binding agents affect the waste similarly to cement. Pozzolonic reactions occur more slowly than cement reactions.

Soil contaminated with lead, barium, and other metals can be treated by a chemical S/S process to meet the WAC of the selected disposal facility. Cement and pozzolonic-based materials have been used at different facilities to treat soil contaminated with metals and radionuclides. Additionally, there are many vendors who have successfully commercialized S/S technology that bonds leachable heavy metals to below RCRA toxicity limits and proposed Universal Treatment Standards, thus allowing disposal on site or off site as a nonhazardous waste.

Electrokinetic Technology can also be used for remediating soils contaminated with metals. This technology has not been fully commercialized. Electrokinetic remediation relies on the application of low intensity direct current between electrodes placed in soil. Contaminants are mobilized in the form of charged species, particles, or ions. Contaminants (metals) are transported to the electrodes where they are removed and subsequently treated aboveground. The electrode spacing and duration of remediation is site-specific. The process requires adequate soil moisture in the vadose zone, so the addition of a conducting pore fluid may be required (particularly due to a tendency for soil drying near the anode). Experience with this technology is limited to bench and pilot scales and only a few commercial applications in Europe.

TCE-Contaminated Areas

TCE-contaminated soil can be treated by thermal desorption systems. Thermal desorption is effective at separating organic from other hazardous wastes. Thermal desorption technology treats soil contaminated with hazardous wastes by heating the soil 200 to 1,000 °F to vaporize contaminants and, consequently, separate the organic compound from the soil. The other soil contaminants, if any, are treated by other methods. The vaporized contaminants are typically collected and treated by an air emissions treatment system.

Thermal desorption is a different treatment process than incineration. Thermal desorption uses heat to physically separate the contaminants from the soil. The contaminants then require further treatment. Incineration uses heat to actually destroy the contaminants.

Thermal desorption technology is commercially available and it can be leased. Based on the current volume of TCE-contaminated soil (approximately 100 to 200 cubic yards), the unit cost would be $1,100 to $1,300 per cubic yard including mobilization and demobilization of the equipment. However, based on the small quantity of material requiring treatment, it is more cost-effective to ship the soil to an appropriate off-site facility for treatment and disposal.

5.3 Waste Segregation

Waste segregation activities are integral part to proposed remedial activities. The RI/FS program identified various types of materials that will not meet the WAC for the OSDF and will require special handling, storage, treatment, and disposal activities. Waste generated during the segregation activities will be staged in approved storage areas (e.g., Plant 1 Pad, SP-7, or the future Area 7 Above WAC Storage Area) prior to shipment for off-site treatment and/or disposition. The following descriptions identify the major segregation activities required for the project.

1. Soil and debris that exceed the WAC for the OSDF will be excavated and staged for proper treatment and/or disposal.

2. Soil containing technetium-99 above the WAC limit will be excavated and staged for off-site disposal.

3. The identified RCRA areas and associated materials will be excavated to remove characteristic waste if the toxicity characteristic is demonstrated by TCLP test. The identified toxicity characteristic material can be placed at the OSDF if the material is properly treated to remove the toxicity characteristic and if radiological COCs are below WAC before treatment. TCLP tests will be conducted during predesign characterization activities to determine whether treatment is required before disposal at the OSDF. In addition, concrete excavated from these areas will be cleaned and sampled for contamination before to transportation to the OSDF.

4. Excavation of material from identified RCRA areas that are above WAC and exhibit toxicity characteristic properties will be segregated from other distinct above WAC material before off-site treatment and/or off-site disposal.

5. Excavation of soil that exhibits the toxicity characteristic and overlaps with an area delineated for technetium-99 excavation will be staged separately before shipment for treatment and off-site disposal.

6. Below-grade piping that is not process-related (e.g., storm sewers, steam lines, potable water lines, conduit) will be size-reduced, as necessary, in accordance with the WAC and

segregated. If these non-process pipes are excavated from areas of soil that do not meet the OSDF WAC, then the debris will be disposed of off site along with the above WAC soil.

7. Below-grade process piping (e.g., K-65 slurry line).

Excavation of other above WAC soil/material will be driven by concentrations of the COCs listed in Table 2-9 of the SEP. Soil containing these COCs at values above WAC will be excavated and sent to approved staging areas where the material will be segregated before disposal.

Excavation activities for HWMU and UST areas will be driven by the FRLs of all COCs present in the unit. Any above WAC material excavated from a HWMU area will be evaluated (sampled) to determine whether it contains a RCRA waste or exhibits a RCRA hazardous characteristic. If so, it will be segregated from other distinct above WAC material before off-site treatment and/or disposal.

When excavation activities encounter special materials or unexpected high levels of contamination, plans may be implemented to address pertinent safety and health concerns. Special materials are defined as:

- Asbestos
- Non-pressurized containers (drums)
- Pressurized containers
- Piping and pumps
- Non-soil residues
- Transformers
- Lead acid batteries
- Uranium metal
- Medical/infectious waste
- Tires
- Brick, including acid brick
- Miscellaneous debris

Portions of these waste streams will be eligible for the OSDF disposition after physical processing, sampling and analysis, or interim containerization. Materials that do not meet the OSDF WAC will be evaluated for off-site disposition. Protocols will be established for identifying, managing, and tracking special materials.

5.4 Waste Minimization

Waste minimization will be achieved by:

- avoiding cross-contamination,
- avoiding recontamination,
- properly sequencing remediation activities, and
- minimizing excavation of any clean area adjacent to contaminated area.

Cross-contamination is defined as elevated levels of contamination from one location being transported to another area where the contamination did not previously exist or was not previously present at the elevated concentration. Recontamination is the cross-contamination of a previously remediated area. This contamination can transport through wind erosion, wind-blown dust generated by excavation-related activities, vehicular traffic, and/or stormwater run-on.

A major consideration in the sequencing of remediation activities is to minimize cross-contamination and recontamination. These goals can be attained by:

- prioritizing excavation of contamination source areas,
- excavating from upgradient surface drainage areas to prevent cross-contamination and recontamination down gradient, and
- controlling haul routes to minimize cross-contamination of all areas and recontamination of clean areas.

5.5 WAO Oversight

The WAO project provides independent oversight of FEMP waste generation, handling, transportation, storage, and placement activities. The WAO project was established to ensure the FEMP owner (DOE), regulatory agencies (EPA and OEPA), and FEMP stakeholders the acceptability of a waste material for placement into the FEMP's OSDF or for shipment off site to a Permitted Commercial Disposal Facility (PCDF). In this capacity, WAO demonstrates the integrity, accountability, and defensibility of the remediation through an evidentiary record of the process.

WAO has programmatic control of the WAC attainment verification, handling, tracking, transport, and final placement of all waste material (soil, debris, and ancillary waste) intended for placement in the OSDF and for shipment to a PCDF. WAO has sole responsibility for final WAC verification and acceptance before final placement of any waste material at the OSDF and before shipment of any waste material to a PCDF. WAO is also responsible for compiling, maintaining, and archiving the final evidentiary records for FEMP compliance with the WAC Attainment Plan.

The scope of WAO project work encompasses both remedial design and remedial action activities at FEMP. WAO actively participates with the FEMP waste generation projects during the characterization, sampling, and design phases of a waste generation project as well as the OSDF-bound stockpiled debris from OU 3 decontamination and dismantling activities in progress. WAO also performs independent peer review of design basis, data, and documentation to ensure technical and administrative compliance with regulatory commitments. The independent peer review includes review of PSPs for sampling (prior to finalization), and review of the final IRDPs before transmittal of the documents to EPA and OEPA for review and approval.

During active waste generation activities (soils and at- or below-grade debris excavation, and above-grade D&D), WAO monitors excavation, material transport, and material storage activities to verify compliance with the approved design-based safe work plans. WAO field representatives are responsible for making the segregation and dispositioning decisions in accordance with the specific IRDP requirements for the types of debris that may be encountered in a respective remediation area. The waste generator projects have responsibility for waste material identification, segregation, handling, and inventory control and management. WAO performs oversight of project activities to monitor the integrity and accountability of those functions.

The WAO project works to the following procedures:

- EW-1021, *Preparation of the Project Waste Identification and Disposition (PWID) Report*
- EW-1022, *Tracking and Manifesting of Bulk Excavated Material*
- EW-1023, *Management of Stockpiles*
- EW-1024, *Management of Containers During Soil Excavations*
- EW-0006, *Management of Above-Grade Debris*
- 34-11-002
- 34-11-003

The WAC Attainment Plan (the basis for the WAO project and its charter document) describes the FEMP material-specific approaches for demonstrating attainment of radiological, chemical, and physical WAC for all materials intended for placement at the OSDF. As defined in the WAC Attainment Plan, three distinct functions contribute to successful attainment of the OSDF WAC: waste generation, waste acceptance, and waste placement. The FEMP remediation projects (principally SCEP, Facilities Closure and Demolition Projects, Aquifer Restoration Project, and the Waste Pits Remedial Action Project) are responsible for generation of waste material and assurance that the material complies with approved WAC for disposal. The OSDF project is then responsible for placement of these accepted waste materials. Consistent with other disposal facilities, an additional independent evaluation and review by WAO of all waste

materials intended for placement at the OSDF is performed to verify and assure WAC compliance.

WAO will review, for technical quality and compliance with WAC protocol, any site documents pertaining to the generation and placement of FEMP waste and will approve all associated engineering plans and documentation. WAO's primary responsibility is to ensure the technical quality, consistency, and implementability of the waste generation project's engineering documentation as it pertains to WAC attainment. WAO will review all technical changes to evaluate any impact to WAC attainment by directly participating in the predesign and design engineering process conducted by the FEMP waste generating projects. WAO will have representation on design teams and/or other groups formed for the purpose of integrating conceptual design into engineering deliverables and IRDPs. WAO will be responsible for reviewing relevant sections of the following deliverables:

- scope of services and facilities including feasibility, design, and functional requirements development including process flow diagrams, piping, concept sketches and layouts, as necessary;
- construction drawings and specifications;
- supplier drawings;
- architect/engineer reviews by during development of remediation drawings and specifications;
- reviews of installation and construction activities as required;
- constructability and maintainability reviews; and
- final project reports for engineering.

WAO also reviews manifests for the OSDF material placement and oversees the OSDF placement activities. Periodically, WAO personnel review waste generator project documentation to ensure appropriate and accurate evidentiary records are being generated and maintained. Assuming the material achieves WAC attainment and such evidence is adequately demonstrated and documented, WAO authorizes transport of the material to the OSDF. WAO then performs the final receipt inspection of waste material at the OSDF and validates the final acceptance and placement location for material at the OSDF. WAO is responsible for compiling the appropriate documentary evidence to demonstrate compliance with applicable RODs, remedial design/remedial action work plans, and other appropriate drivers; WAO is also responsible and for maintaining relevant information files for FEMP record purposes until project closeout.

WAO has developed and will maintain a PCDF WAC Attainment Plan (2500-PL-0007) which describes the FEMP approach for demonstrating attainment with the radiological/chemical and physical WAC for waste generated by FEMP for off-site disposal. The WAC attainment requirements are derived from the FEMP RODs and the PCDF WAC. The plan provides both

the prescribed guidance for WAC attainment and describes strategies for complying with the requirements for FEMP wastes to be shipped off site for disposal.

For FEMP projects generating waste materials intended for shipment to a PCDF, WAO's oversight involvement begins at the point of project design and continues through PCDF WAC verification for disposal. WAO acceptance of any waste material for shipment to a PCDF shall be contingent upon demonstration of traceability to the materials' point of origin.

6.0 Excavation Sequencing and Design

A phased excavation approach, as defined in Section B.3, Vol. II of the SEP (DOE 1998a), will be used to achieve the remedial objectives and to ensure that cost-saving measures, enhanced excavation techniques, and identified problems are incorporated into successive areas undergoing excavation.

Excavation of contaminated soil and at- and below-grade debris will be sequenced to minimize cross-contamination of areas and to allow utilization of the Plant 1 Pad for waste storage as long as possible. To achieve these objectives, the following sequencing criteria have been established:

1. Identify areas of risk near the OSDF footprint (i.e., the eastern boundary of Areas 3A and 4A). The risk of slope failure near the OSDF during excavation activities in Areas 3A and 4A should be investigated.

2. Identify existing and proposed drainage areas.

3. Prioritize potential RCRA and potential above WAC sources of contamination and select for early removal.

4. Prioritize areas from upgradiant to downgradiant. In most cases, excavation is planned to proceed from an upgradiant to a downgradiant surface water direction to minimize the potential of recontamination by contaminated surface runoff.

The SEP established the preliminary Sitewide Sequencing Plan (the order in which Remediation Areas will be remediated) as follows: Area 3, Area 4A, Area 4B, and Area 5. However, since release of the SEP, Area 3 has been broken into Areas 3A and 3B, with the Plant 1 Pad representing 3B. Due to the schedule extension for use of the Plant 1 Pad, remediation in the Former Plant Area is now scheduled as 3A, 4A, 3B, 4B and 5. Further, the OU 5 RI/FS report (DOE 1995) indicates that the perched groundwater surface "slopes to the west-southwest." Therefore, the remedial excavations within an area will be conducted generally from the northeast to the southwest to avoid the potential for perched groundwater to recontaminate previously remediated areas.

6.1 Site Preparation

Site preparation will begin after submission and approval of the IRDP, submission of bid package, and award of contract. Site preparation will consist of the construction activities and

tasks necessary to prepare the site for soil excavation and removal of at- and below-grade utilities and foundation structures. Site preparation will include the following items:

- Establishing limits of construction (boundaries) and access controls – Initial site preparation activities will include establishing defined construction areas and access controls in the field and posting appropriate signs at construction boundaries. The purpose of this activity is to control access and ensure that appropriate safety procedures are observed. Construction areas will be established based on potential radiological exposure, the type of work to be performed and location. Areas will be posted based on radiological requirements.

- Establishing support facilities – A portion of the existing Receiving/Incoming Materials Inspection Area (RIMIA) facility may be renovated to serve as a contractor support facility for all remediation areas within the Former Plant Area. The contractor support facility will include change-out rooms, showers, restrooms, break facilities, radiation access control, and decontamination (personnel and equipment) provisions. Mobile change facilities will be used for overflow conditions, as needed. A cool down trailer will be provided in each work area, and the location can vary within the work area.

- Establishing support areas – Within each work area, adjacent to the haul roads, vehicle access areas with portable wheel wash stations may be established. The primary objective of the wheel wash facility is to minimize material being transported from the tires of the trucks onto the haul road. Wheel wash collection areas will be located adjacent to the optional wheel wash stations. Collected water will be routed to the storm sewer. Other support areas needed within each area will include dewatering areas for staging soil containing free liquids and a staging area for stockpile and size reduction. The locations can be altered as work progresses.

- Establishing haul routes – Traffic routing as well as construction activities will be controlled to minimize haul routes through excavation areas. Minimizing haul routes through active excavation areas will minimize dust generated and cross-contamination of precertified clean areas. After exiting the active excavation area, traffic routing will be via paved roads, to the extent practical. Primary destinations for the haul routes will be the OSDF and SP-7 and Area 7 Above WAC Storage Area.

- Implementing surface water management systems – Surface water management systems will be installed during the site preparation phase to control surface water runoff/run-on, provide erosion and sedimentation control, minimize potential recontamination of remediated areas, and minimize discharges of potentially contaminated surface water during remediation. These systems will be monitored and may be modified during construction. Surface water management, erosion, and sediment control facilities will be designed for each specific area. The water management systems will continue until certification is complete.

- Clearing and grubbing (if required) – Clearing (i.e., cutting and removal of trees) will typically be the first step of excavation. Trees and shrubs will be cut at a level above-grade that corresponds to appropriate safety and health protocols. Removal and chipping

of tree trunks and upper branches may be stockpiled for later use as mulch. Stumps and roots of the trees will be considered organic matter and must be handled as the OSDF Category 4 material.

- Removing surface material (if required) – Surface material (i.e., gravel, pavement, railroad ties, and ballast) will be removed during excavation. The gravel and ballast may be used as a road surface for haul routes into the OSDF cells.

- Establishing survey controls – The contractor will establish project site survey control points (including baselines and temporary benchmarks) in the field based on the coordinate system shown on the drawings and/or furnished by FDF.

- Maintaining utilities – All area-specific underground utilities will be identified to the extent practicable before excavation begins. All active utilities within areas to be excavated will be protected, permanently shut off, or rerouted.

- Storage Area – An interim container storage area will be established to stage both single use and reuse waste containers.

6.2 Excavation Approach

The fundamental excavation sequencing for all areas will typically include the following steps.

- 0 ft to 3 ft depth: remove surface or isolated potential above WAC material;
- 0 ft to 3 ft depth: remove potential RCRA, UST, and/or HWMU material;
- 0 ft to 3 ft depth: remove gravel, shallow utilities, and shallow foundations;
- 0 ft to 3 ft depth: perform general excavation;
- 3 ft to 10 ft depth: remove potential above WAC material;
- 3 ft to 10 ft depth: remove potential RCRA, UST, and/or HWMU material;
- 3 ft to 10 ft depth: remove utilities and foundations;
- 3 ft to 10 ft depth: perform general excavation;
- greater than 10 ft depth: remove potential above WAC material;
- greater than 10 ft depth: remove potential RCRA, UST, and/or HWMU material;
- greater than 10 ft depth: remove remaining utilities and foundations;
- greater than 10 ft depth: perform general excavation.

Refer to Figures 6-1 to 6-5 at the end of Section 6.7 for excavation sequencing.

The purpose of Figures 6-1 through 6-5 is to provide an illustration of the excavation sequence required to remove the at-and below-grade foundations and the contaminated soil. The figures include the following information:

- The depth of excavation for any location within an area is indicated by the cross-hatched pattern as shown by the legend symbols of each figure.

- The figures show the sequence of excavation over the entire area to be from 0 ft to 3 ft, then as required, from 3 ft to 10 ft, and finally, all areas requiring removal of soil greater than 10 ft deep.

- The contour lines indicate the depth of required excavation, as determined by the 3-D model. (See Figures A-6 and A-7)

- The location of potential RCRA and potential above WAC areas are also shown in the sequence of excavation.

The IRDP and specifications for excavation will be developed based on data contained in the Sitewide Environmental Database (SED) and will include the proposed excavation limits and depths determined by the 3-D excavation model. The information will be presented to remediation contractors in construction drawings and technical specifications. Excavation will be performed in three distinct phases: 0 ft to 3 ft depth, 3 ft to 10 ft depth, and greater than 10 ft depth. Within each phase, multiple lifts may be required to remove the soil. During each phase, excavation activities will include, but are not limited to, the following:

- Excavation limits - Excavation limits shown on the drawings will be the basis for initial excavation; when these limits are achieved, precertification surveys will be performed to evaluate suitability of the area for final certification.

- Establishing existing benchmarks - Existing benchmarks and survey monuments will be shown on the drawings. All areas to be excavated will be staked in the field and approved by FDF before excavation begins.

- Identification of utilities - Utility lines include storm sewer, sanitary sewer, water, electric, gas, communication, and sump lines. Excavation of utilities will include the utility lines, contaminated soil, and backfill material. The remediation contractor will be responsible for protecting utilities in and around the excavation areas and removing utilities within the excavation as identified on the drawings. During excavation, if any utilities are found that were not identified before excavation, all excavation efforts will be stopped; per site procedures, FDF will then be contacted for proper identification and guidance.

- Remove potential above WAC material - The material will be excavated and transported to the SP-7 or Area 7 Above WAC Storage Area. This phase of excavation will require the greatest number of administrative and engineering controls. Excavation activities in these areas will be performed with dedicated pieces of equipment located inside the area. Materials will be loaded into trucks or containers staged in a buffer zone directly adjacent to the area.

- Remove potential RCRA, UST, and/or HWMU material – If elected, in situ treatment of RCRA material will be completed before the material is excavated and transported. Materials meeting the WAC will be transported to the OSDF. All remaining materials will be transported to the Plant 1 Pad. Material will be loaded into trucks or containers staged in a buffer zone directly adjacent to the area.

- Remove gravel, utilities, and foundations – The excavation will generally proceed from north to south (upgradient to downgradient) using standard excavating equipment, including backhoes, scrapers, dozers, loaders, or similar equipment. Excavated material will be managed according to waste disposition protocols. The material will be hauled directly to the OSDF or hauled to the OSDF after any potential resizing.

- Perform general excavation – After removal of gravel, utilities, and foundations, the remaining soil material will be removed using standard excavating equipment. Again, excavation will generally proceed from north to south. The material removed as part of the general excavation will be hauled directly to the OSDF.

- Additional considerations for slope stabilization will be required for the deeper excavations. Refer to Section 6.6 for a detailed discussion. The foundations in these zones will be removed by one of the methods discussed in Section 4.6.

The estimated volume of contaminated soil to be removed from the Former Plant Area is 1,245,181 cubic yards. The estimated volume was derived from the 3-D model and is distributed as follows:

Area 3A -	168,575 cubic yards
Area 4A -	150,355 cubic yards
Area 3B -	133,126 cubic yards
Area 4B -	744,702 cubic yards
Area 5 -	48,423 cubic yards

6.3 Deep Excavation and Slope Stabilization

Deep excavation involves the removal of below-grade building footings, slabs, grade beams, piles, and contaminated soil. Excavation of contaminated material will be accomplished with bulldozers, loaders, excavators, backhoes and other equipment, as necessary. It is recommended that minimum cover of approximately 5 ft of material be placed above the GMA. All areas not meeting the minimum cover of approximately 5 ft should be restored after removal of all impacted materials. The 5-ft total thickness of precertified material should be low permeable clay taken from the active excavation and placed in compacted lifts. The estimated volume of clean, clay material needed to maintain the 5-ft zone is 30,568 cubic yards. The number of cubic yards needed for Areas 3A, 4A, and 4B, respectively, are 245 cubic yards, 15,840 cubic yards, and 14,483 cubic yards.

Steep side walls will be avoided during deeper excavations (i.e., over 4 ft). The preferred approach is to construct multiple benches in the side slope as the excavation depth increases. The footprint of the excavation will encompass all the expected subsurface soil and debris that needs

excavation. Although subsurface contamination cannot be fully characterized before excavation, any unexpected contamination found by real time scanning during excavation will be removed during excavation. The benched side slope design will allow easier extension of the lower lateral excavation boundary when the need arises to remove additional contamination. Figure 6-6 illustrates a conceptual side slope configuration for a deep excavation.

Although the multistep side slope approach is preferred for deep excavations, it may not always be possible to slope all sides of an excavation due to limited area access. When necessary, driven vertical barriers or other means may be used.

Rough grading will be performed before precertification activities to remove ruts or projecting objects that could damage the real-time instruments used in the precertification survey. Interim grading will flatten slopes and prepare the remediated area for final restoration. Additionally, interim grading establishes the surface water drainage controls within the area and develops the site into the restored land use type. Regardless of the level of interim grading, temporary ground cover will be used to stabilize the soil in place until final grading and restoration begins.

6.4 Segregation, Staging, and Sizing Operations

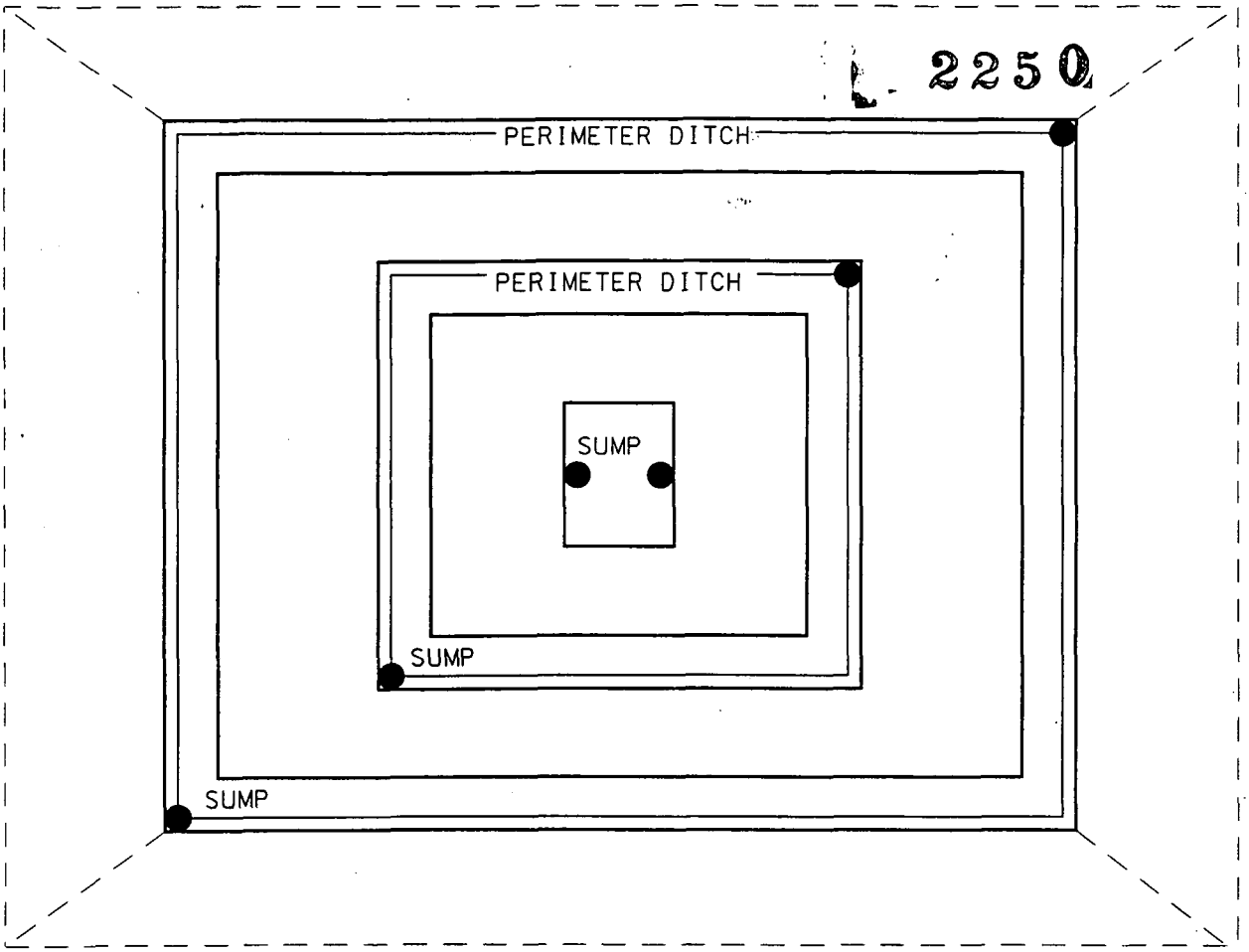
Remediation of the soil and at-and below-structures will generate a significant quantity of debris materials. These materials will consist of building foundations and slabs, underground utilities such as water, sewer, and electrical, roadway materials, and miscellaneous buried debris. All material will be dispositioned at the OSDF, with the exception of special materials identified in the OU 3 ROD that will require off-site disposal.

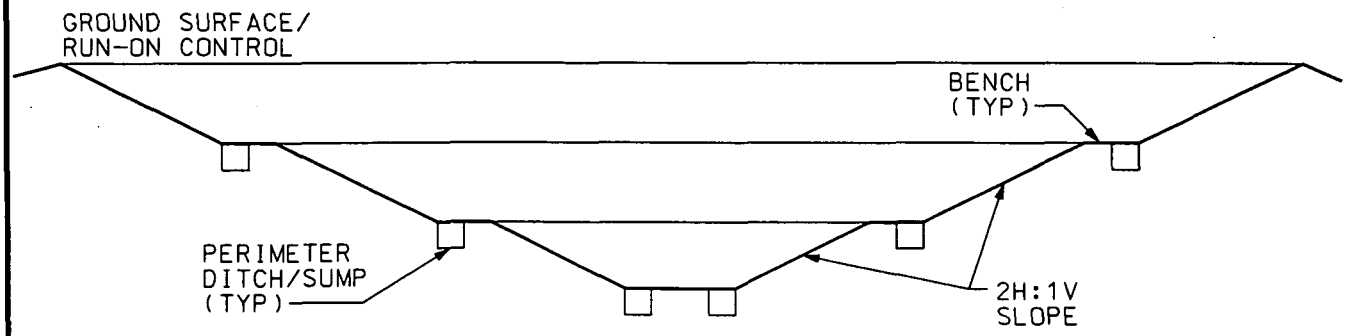
The generated debris will be segregated from the soil material and taken to a designated staging area within each work area prior to being sent to the OSDF.

Activities to be performed in these areas include:

- segregation, sizing and packaging of potential above WAC, potential RCRA, and the OSDF restricted materials for off-site disposal;
- segregation, sizing and packaging of materials in accordance with the WAC for the OSDF; and
- limited treatment activities may also be initiated to ensure WAC attainment for both the OSDF and off-site disposal.

Soil remediation activities will require all potential above WAC and potential RCRA toxicity characteristic soil to be segregated from above-FRL soil. The potential above WAC and potential RCRA toxicity characteristic soil will be sent to an approved staging or storage facility for off-site disposal.





TITLE

FIGURE 6-6
CONCEPTUAL SIDE SLOPE
CONFIGURATION FOR DEEP EXCAVATION

FLUOR DANIEL FERNALD

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The preferred approach for handling above-FRL soil is excavation and transportation to the OSDF. Additional soil staging and handling is anticipated should the soil require dewatering as a result of excessive rain or high moisture content caused by perched water. Soil staging may also be required to meet the OSDF 4:1 soil to debris requirement.

6.5 Seasonal Shutdown (Winterization)

Winterization includes activities necessary to ensure that an excavation area can be reentered and that construction can restart in minimal time following winter shutdown (from January through March). Winterization activities include:

- contractor observation of all exposed surfaces within the contractor's work limits, with follow-up stabilization as warranted;
- contractor observation of all drainage channels and sediment and erosion control devices, with follow-up maintenance as warranted;
- contractor identification of any water lines susceptible to freezing, with subsequent modification of those lines to prevent freezing or inclusion of those lines in the plan mentioned in the next activity;
- contractor submittal of a plan that itemizes winter maintenance actions and assigns those actions to appropriate personnel for those project systems and/or components that cannot be safely left unobserved and/or unmaintained over the winter;
- follow-up site inspection by FDF to ensure that the winterization steps are addressed; and
- modification of excavation slope by subcontractor to assure stability during winter shutdown.

6.6 Interim Stabilization

After individual work areas are precertified, additional maintenance activities must still be accomplished until final stabilization. These activities include, but are not limited to, the following:

- reseeding;
- repair of localized slope failures/sloughing;
- maintenance of pumps, lines, and tanks associated with pumping; and
- vegetative control (mowing).

Long-term cut slopes will result in unnecessary erosion, and the remediation contractor will be required to stabilize earthen slopes using seeding, spraying of crusting agents, or other suitable means.

- The crusting agent will be applied and reapplied to eroded and bare areas, as necessary to maintain proper erosion control.

- Slope stabilization using established habitat and/or grass growth will require bed preparation. Sloped areas should receive a protective matting after seed application. A broadcast seeder or hydroseeder may be used, and seeded areas will be mulched (with the exception of sloped areas with protection matting.)

Maintenance access provisions should be made to facilitate the postexcavation interim stabilization. The excavation contours should allow maintenance access to the affected areas. The access roads must have decontamination facilities (portable) at the boundary between contaminated areas and the precertification areas. Maintenance equipment must be decontaminated before entering a precertification area. Access provisions must also consider removal of surface and perched water, which comes in contact with the contaminated side slopes adjacent to precertified areas. Refer to Figures 6-7 to 6-11 at the end of Section 6.7 for maintenance access.

Figures 6-7 through 6-11 illustrate the extent of each area that may be precertified immediately after excavation and the facilities required to maintain precertification, including stormwater management and site access.

- The contour lines indicate the depth of required excavation as determined by the 3-D model. Parallel lines indicate where 2H:1V side slopes are required at the area boundary. The grading required for the buffer area and maintenance roads is not shown here.

- A precertification boundary will be located 50 ft inside the area boundary or 50 ft inward from the bottom of the 2H:1V side slope. The boundary will provide a buffer zone for a perimeter road to allow access for site inspection and maintenance. The buffer area will be graded to slope away from the precertified area. A ditch will be provided as close to the area boundary as possible to allow collection of stormwater that will flow to a sump and be pumped out of the area to the nearest active sediment trap.

- Decontamination facilities will be provided at all locations where it is necessary for vehicles to enter the precertified areas from the buffer zone.

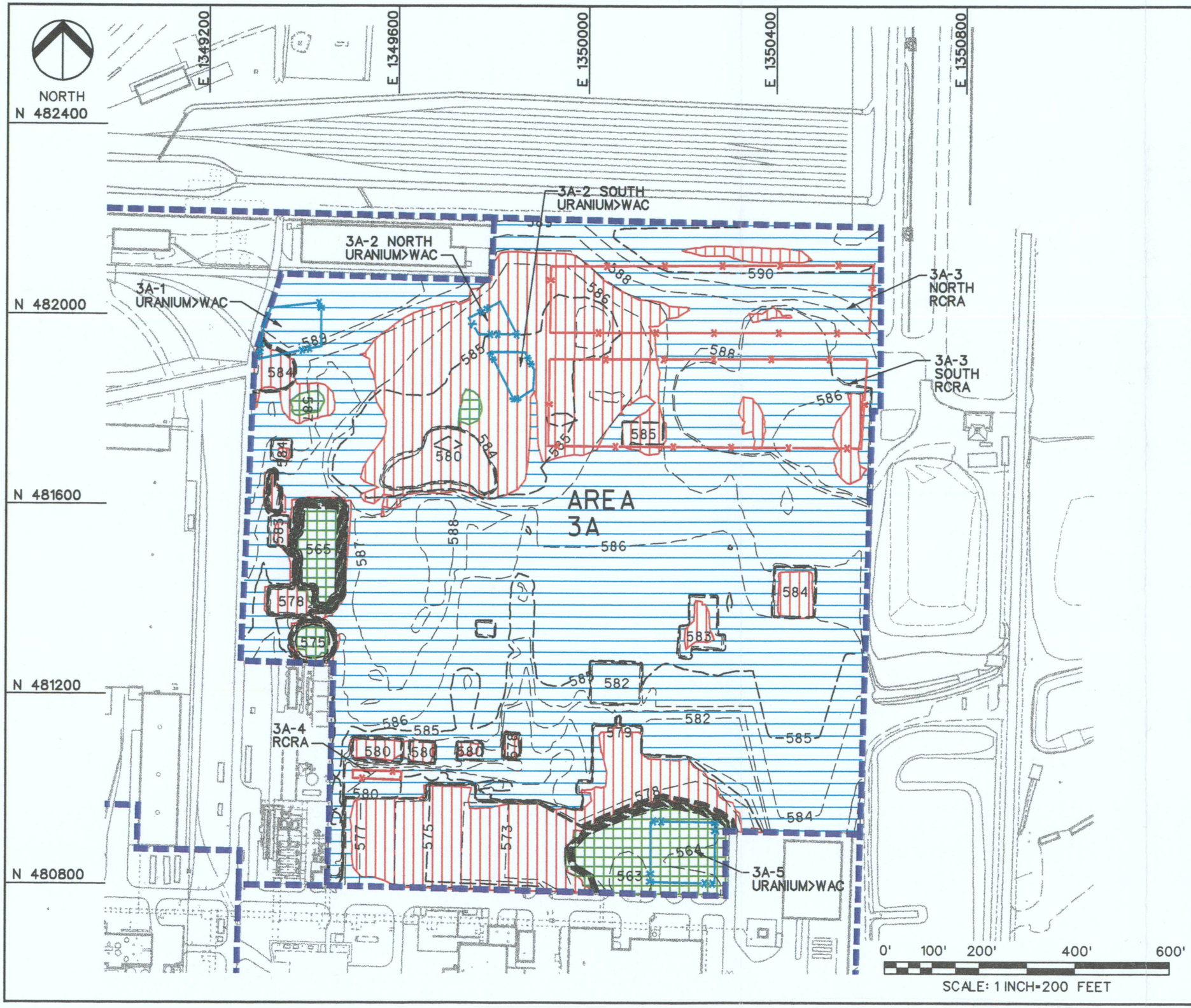
- Dewatering pumps will be installed at low points within the certified area, and stormwater diversion dikes will divert water from uncertified areas. Channels will be provided between low points to provide a common collection, point minimizing the number of dewatering pumps that will be required.

6.7 Alternate Sequencing and Design

The anticipated sequencing of work areas from 3A to 4A to 3B to 4B to 5 meets the sequencing objectives previously stated. If alternate sequencing of work areas is chosen, the proper design considerations should be given to the revised order. Alternate sequencing can be accommodated, but the sequencing objectives must still be met, and the additional engineering and construction costs must be considered.

Specifically, Area 3B may be the last area to be remediated because of shipping delays associated with existing containerized waste located on the Plant 1 Pad. Because Area 3B is upgradient from Area 4B, additional engineered controls must be placed in Area 3B to prevent contaminated surface water and perched water from recontaminating remediated or certified zones in Areas 3A, 4A and 4B. Also, the existing storm drain through Areas 4B and 5 would need to remain or Area 3B waters would need to be pumped through surface piping. Other disadvantages include the need to establish a corridor to Area 3B through previously precertified areas, and reestablishment of haul routes to the OSDF and the OSDF Material Transfer Area (OMTA).

An advantage is SP-7 would not have to be relocated to the Area 7 Above WAC Storage Area. Also, excavating Area 4B before Area 3B may be a viable option for attaining required soil to debris ratios for the OSDF.



LEGEND

AREA BOUNDARY

MAJOR CONTOUR (5 FT INTERVAL) — — 585 — —

MINOR CONTOUR (1 FT INTERVAL) — — 584 — —

POTENTIAL RCRA

POTENTIAL ABOVE WAC

0'–3' EXCAVATION

3'–10' EXCAVATION

>10' EXCAVATION

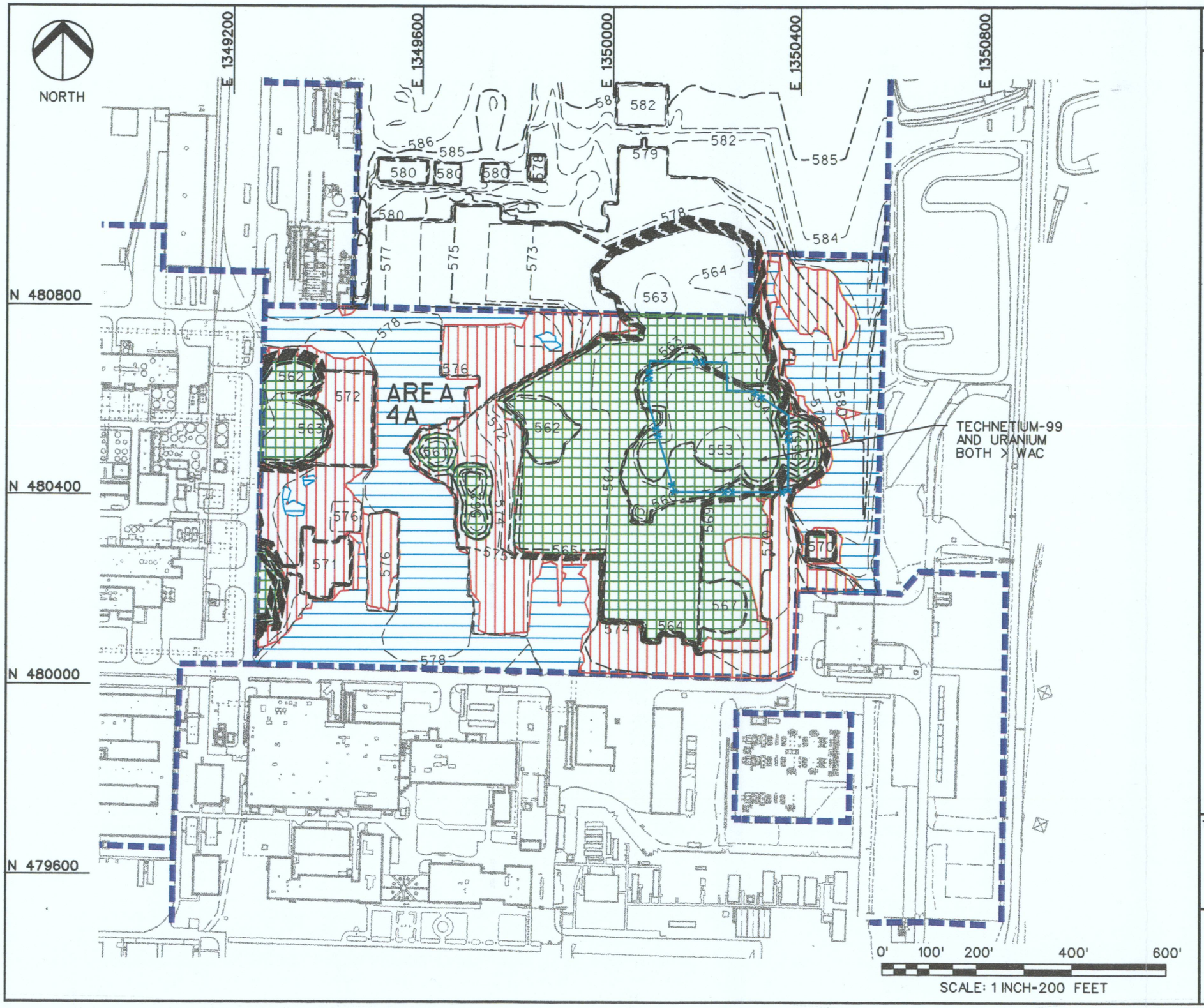
2250

000058

TITLE

FIGURE 6-1
EXCAVATION SEQUENCING
FOR AREA 3A

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY

MAJOR CONTOUR (5 FT INTERVAL) — 585 —

MINOR CONTOUR (1 FT INTERVAL) — 584 —

POTENTIAL ABOVE WAC

0'–3' EXCAVATION

3'–10' EXCAVATION

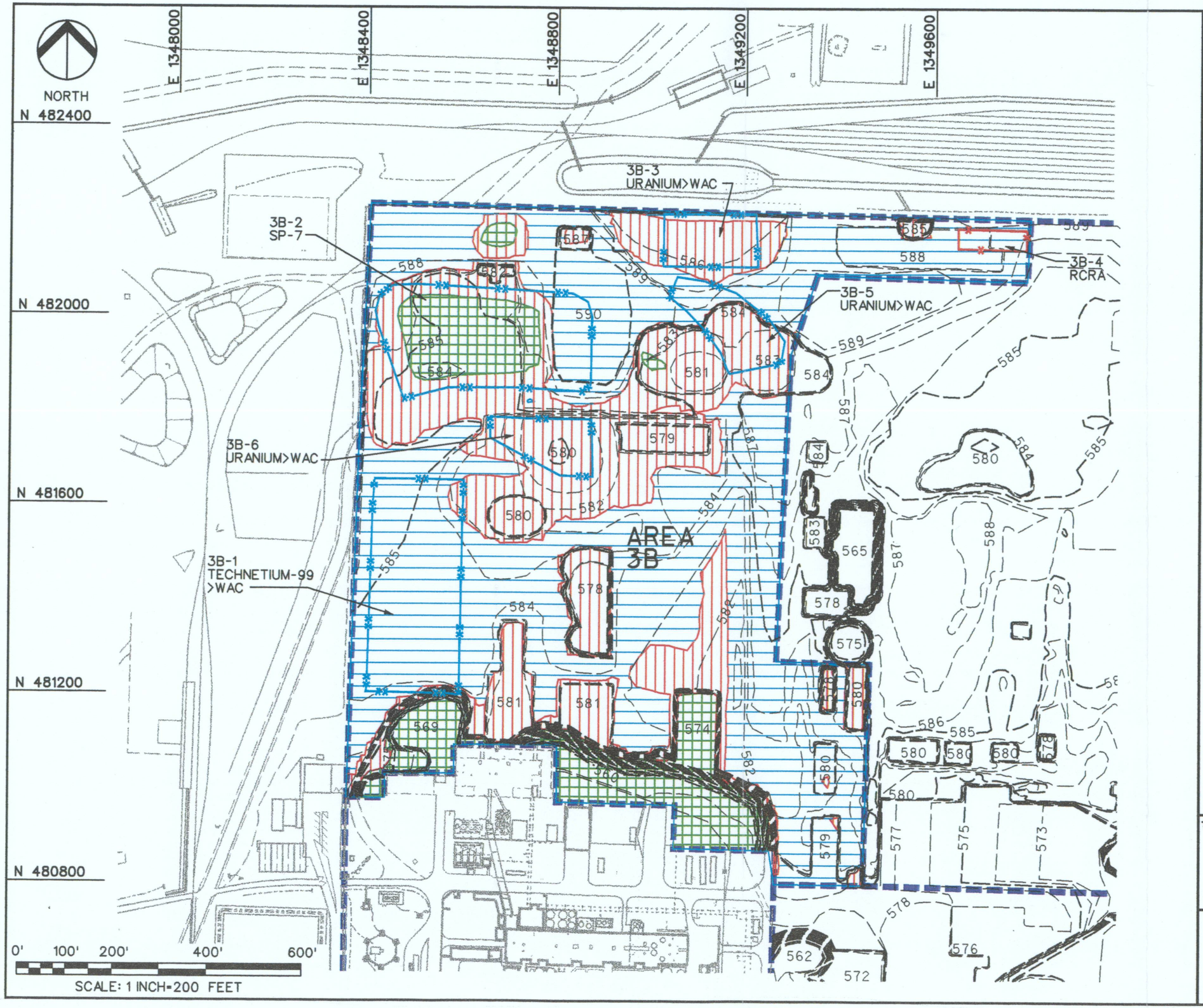
>10' EXCAVATION

000059

TITLE

FIGURE 6-2
EXCAVATION SEQUENCING FOR AREA 4A

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY

MAJOR CONTOUR (5 FT INTERVAL) 585

MINOR CONTOUR (1 FT INTERVAL) 584

POTENTIAL RCRA

POTENTIAL ABOVE WAC

0'–3' EXCAVATION

3'–10' EXCAVATION

>10' EXCAVATION

2250

OC0060

TITLE

FIGURE 6-3
EXCAVATION SEQUENCING FOR AREA 3B

FLUOR DANIEL FERNALD

LEGEND

AREA BOUNDARY

MAJOR CONTOUR (5 FT INTERVAL) 585

MINOR CONTOUR (1 FT INTERVAL) 584

POTENTIAL RCRA

POTENTIAL ABOVE WAC

0'–3' EXCAVATION

3'–10' EXCAVATION

>10' EXCAVATION

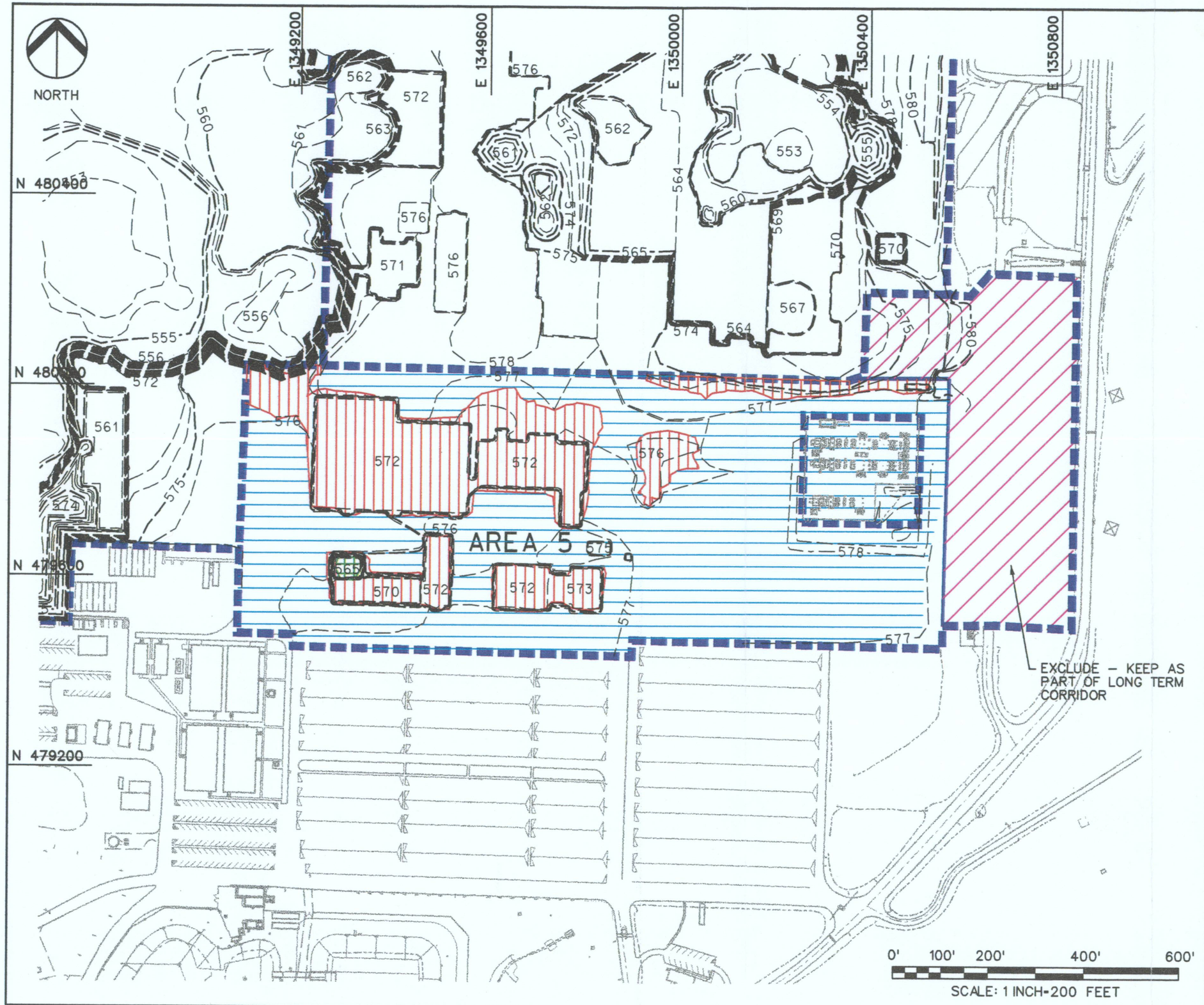
2250

000061

TITLE

FIGURE 6–4
EXCAVATION SEQUENCING FOR AREA 4B

FLUOR DANIEL FERNALD



LEGEND

2250

AREA BOUNDARY

MAJOR CONTOUR (5 FT INTERVAL) — — 585 — —

MINOR CONTOUR (1 FT INTERVAL) — — 584 — —

0'–3' EXCAVATION

3'–10' EXCAVATION

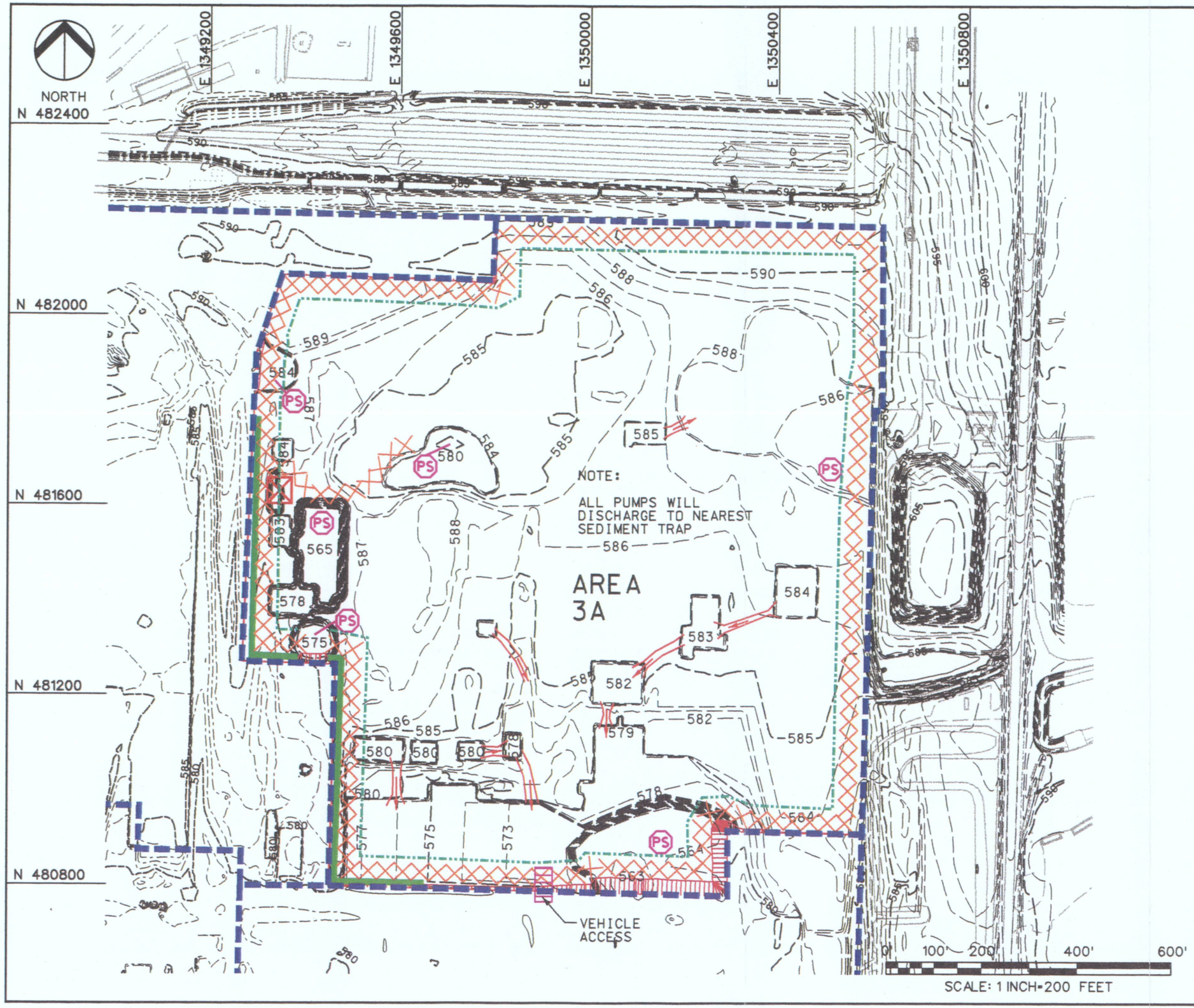
>10' EXCAVATION

000062

TITLE

FIGURE 6–5
EXCAVATION SEQUENCING FOR AREA 5

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY 2250

MAJOR CONTOUR (5 FT INTERVAL) — — 585 — —

MINOR CONTOUR (1 FT INTERVAL) — — 584 — —

PUMP STATION MAINTENANCE ROAD

PUMP STATION

STORM WATER DIVERSION DIKE

PRECERTIFICATION BOUNDARY

2H:1V SLOPE LINE

DECON FACILITY

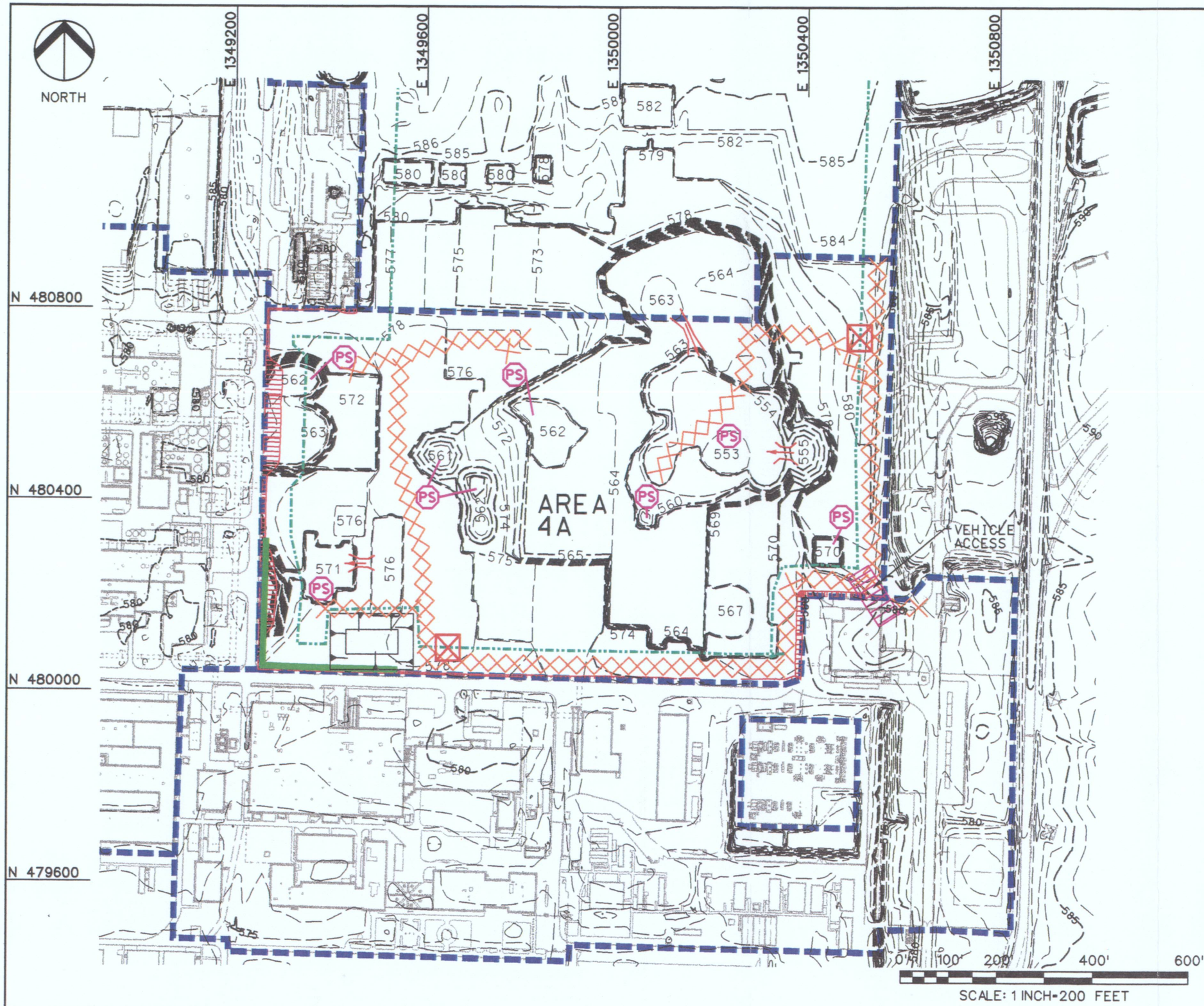
DRAINAGE CHANNEL

000063

TITLE

FIGURE 6-7
PRECERTIFICATION AND MAINTENANCE ROADS FOR AREA 3A

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY

MAJOR CONTOUR (5 FT INTERVAL) — 585 —

MINOR CONTOUR (1 FT INTERVAL) — 584 —

PUMP STATION MAINTENANCE ROAD

PUMP STATION

STORM WATER DIVERSION DIKE

PRECERTIFICATION BOUNDARY

2H:1V SLOPE LINE

DECON FACILITY

DRAINAGE CHANNEL

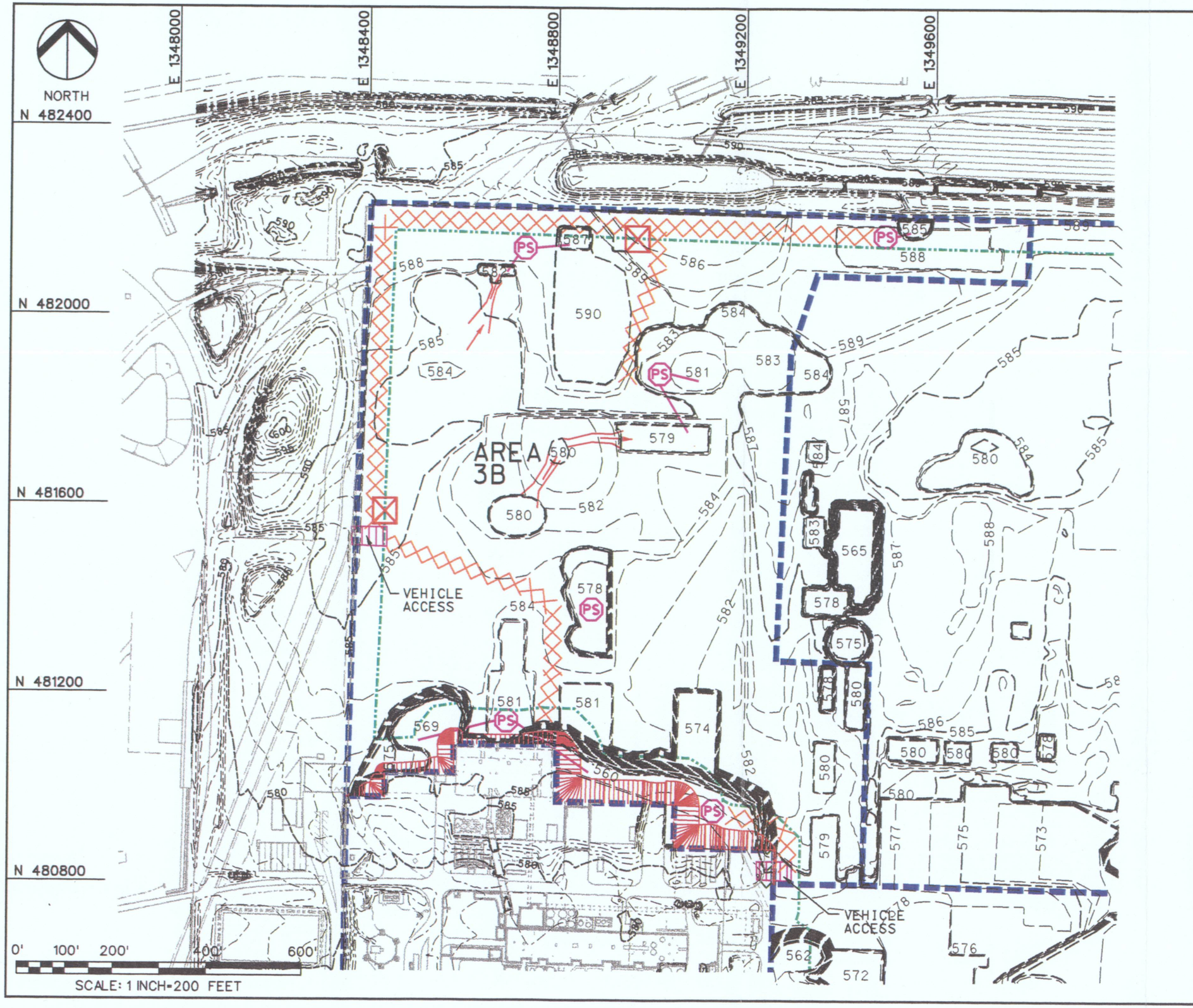
2250

000064

TITLE

FIGURE 6-8
PRECERTIFICATION AND MAINTENANCE ROADS FOR AREA 4A

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY 2250

MAJOR CONTOUR (5 FT INTERVAL) — 585 —

MINOR CONTOUR (1 FT INTERVAL) — 584 —

PUMP STATION MAINTENANCE ROAD

PUMP STATION

STORM WATER DIVERSION DIKE

PRECERTIFICATION BOUNDARY

2H:1V SLOPE LINE

DECON FACILITY

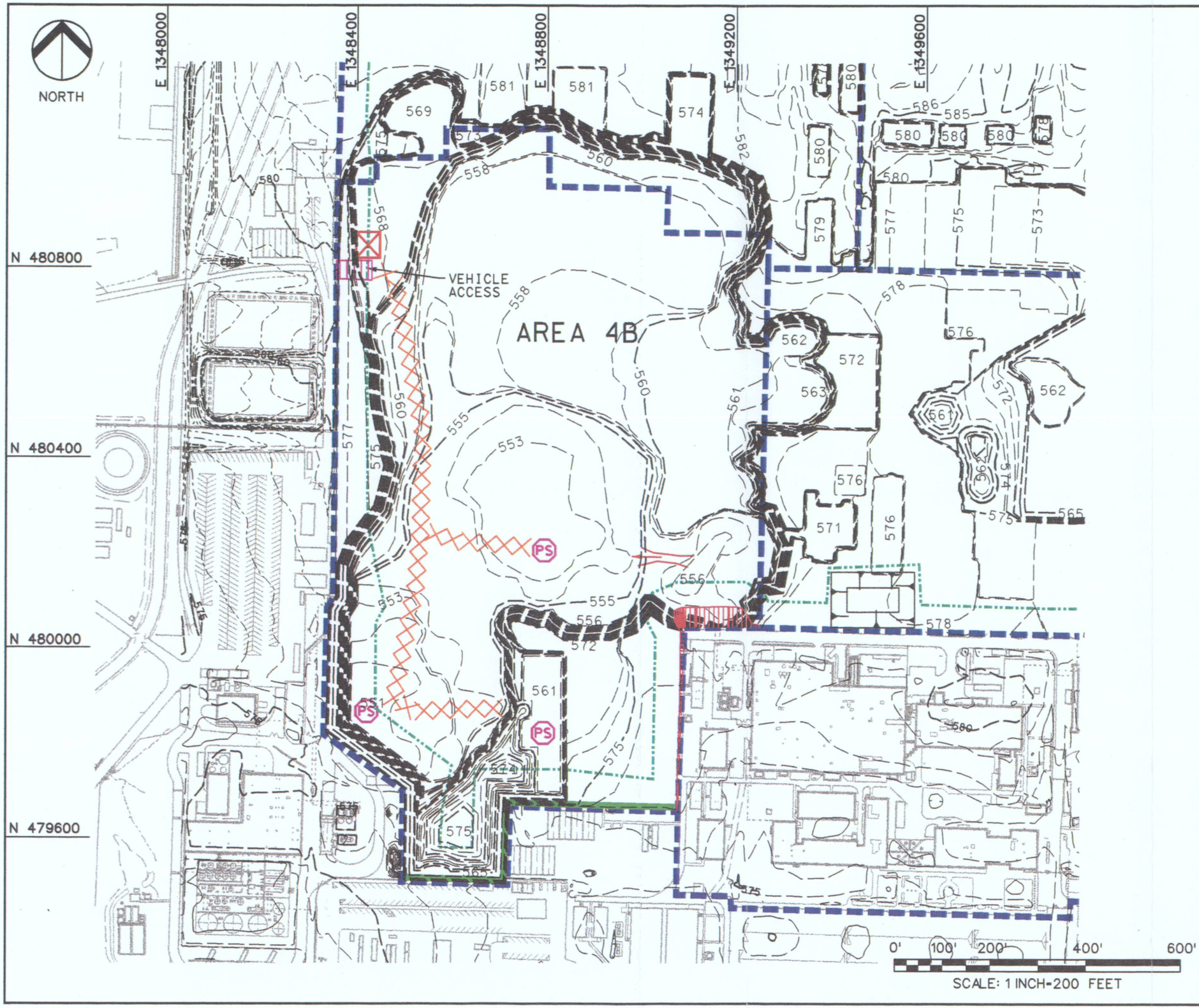
DRAINAGE CHANNEL

000065

TITLE

FIGURE 6-9
PRECERTIFICATION AND MAINTENANCE ROADS FOR AREA 3B

FLUOR DANIEL FERNALD



LEGEND

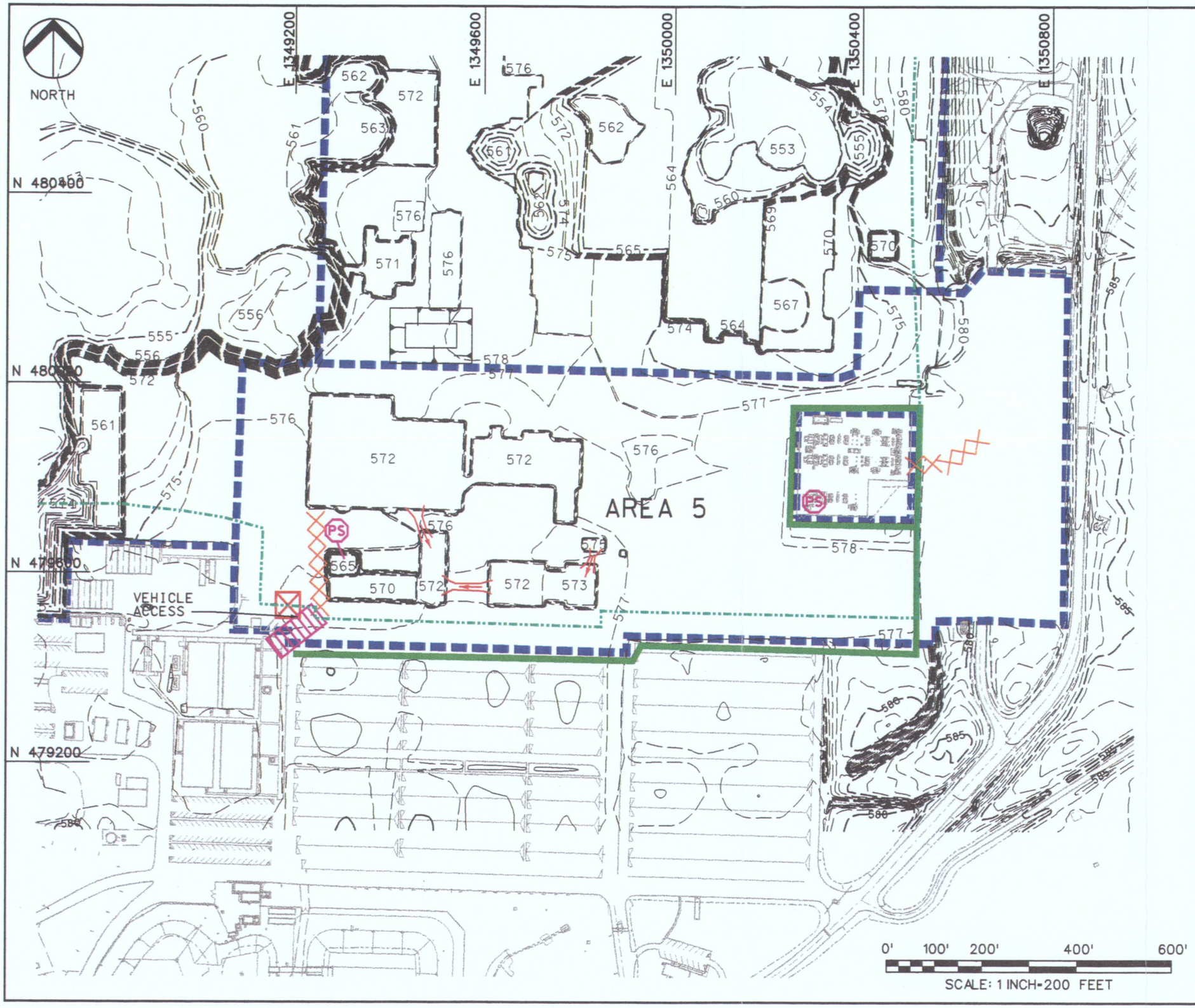
AREA BOUNDARY	
MAJOR CONTOUR (5 FT INTERVAL)	2250 — 585 —
MINOR CONTOUR (1 FT INTERVAL)	— 584 —
PUMP STATION MAINTENANCE ROAD	
PUMP STATION	PS
STORM WATER DIVERSION DIKE	
PRECERTIFICATION BOUNDARY	
2H:1V SLOPE LINE	
DECON FACILITY	
DRAINAGE CHANNEL	

000066

TITLE

FIGURE 6-10
PRECERTIFICATION AND MAINTENANCE ROADS FOR AREA 4B

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY	2250
MAJOR CONTOUR (5 FT INTERVAL)	585
MINOR CONTOUR (1 FT INTERVAL)	584
PUMP STATION MAINTENANCE ROAD	
PUMP STATION	PS
STORM WATER DIVERSION DIKE	
PRECERTIFICATION BOUNDARY	
2H:1V SLOPE LINE	
DECON FACILITY	
DRAINAGE CHANNEL	

000067

TITLE

FIGURE 6-11
PRECERTIFICATION AND MAINTENANCE ROADS FOR AREA 5

FLUOR DANIEL FERNALD

7.0 Conceptual Design

2250

Site preparation and excavation activities specific to Areas 3A, 4A, 3B, 4B, and 5 are described in Sections 7.1, 7.2, 7.3, 7.4, and 7.5, respectively. Site preparation activities common to all remediation areas are described in Section 6.1.

The site preparation figures (Figures 7-1 through 7-5 at the end of Section 7.5) illustrate the components of site preparation necessary before major excavation may begin. The figures include the following information:

- Stormwater management construction components including sediment traps, diversion dikes, ditches, existing concrete channels, and existing storm sewers.
- Potential RCRA areas and potential above WAC areas are shown to be removed, and facilities will be located for soil dewatering.
- Pumps are shown as a means of dewatering the excavations of RCRA and above WAC areas.
- Water from excavated areas will be pumped to existing storm sewers or force mains will be installed that discharge to sediment traps.
- Optional wheel wash stations are shown at points where vehicles may exit the area.
- Vehicle access points and haul routes to the OMTA, SP-7, Area 7 Above WAC Storage Area, and the OSDF are also shown.

Excavation activities common to all remediation areas are described in Section 6.2.

The site excavation figures (Figures 7-6 through 7-10 at the end of Section 7.5) show the limits of excavation required for removal of the at-and below-grade foundations and the contaminated soil. The figures include the following information:

- Limits of excavation contours and existing contours for adjacent areas are shown.
- Haul routes to the OMTA, SP-7, Area 7 Above WAC Storage Area, and the OSDF are shown; however, the grading required for these roads is not shown.
- Parallel lines indicate where 2H:1V side slopes are required at the Area boundary. The parallel slope lines are shown where the actual 2H:1V contour lines would be too congested to interpret.
- Dewatering pumps will be installed at low points within the excavated area and stormwater diversion dikes will divert water from off site.

000068

- Channels will be provided between excavation low points to provide a common collection point. The common collection point will minimize the number of dewatering pumps required.

- Dewatering pumps will discharge to the nearest sediment trap.

Figures A-1 to A-5 in Appendix A depict plan and sections of the limits of excavation.

7.1 Area 3A

Site Preparation for Area 3A (Figure 7-1)

Site preparation activities will consider all activities noted in Section 6.1, with emphasis on the following:

- Establish construction boundaries and access controls for the potential RCRA and potential above WAC areas. The areas are:

  1. 3A-1, potential above WAC - located at the northwest corner of Area 3A.

  2. 3A-2, potential above WAC - located at the north end of Area 3A. This above WAC area is divided into a north and south area by the existing haul road. Above WAC material is anticipated to be below the haul road.

  3. 3A-3, potential RCRA - located at the northeast corner of Area 3A. The area is divided into a north and south area by the existing haul road. Potential RCRA material is anticipated to be located below the haul road. Lead is the primary constituent of concern (PCOC) for this area.

  4. 3A-4, a potential RCRA site is located at the southwest corner of Area 3A and TCE is the PCOC for this area.

  5. 3A-5, potential above WAC - located at the southeast corner of Area 3A.

- The main haul road through the north end of Area 3A will remain until initiation of excavation activities in the northeast corner of Area 3A. Other existing roads that will be used for haul roads are B Street and 2nd Street.

- The existing concrete channel located along the north boundary of Area 3A will be used to prevent surface water from migrating into or out of Area 3A.

- The Area 3A Tank Farm sediment trap (19) will be enlarged to serve as a sedimentation trap for stormwater surface flow from Area 3A. Runoff from the west half of Area 3A excavation will be routed through the Tank Farm sediment trap and then pumped to the existing storm sewer and allowed to gravity flow into the existing storm sewer and to the SWRB.

2250

- A new sediment trap will be constructed at the southeast boundary of Area 3A to capture sediment from stormwater runoff on the east half of Area 3A.

- A new sediment trap will also be constructed at the northwest portion of Area 4A adjacent to 2nd Street. Water collected at the sediment trap at the southeast boundary of Area 3A will be pumped to the sediment trap adjacent to 2nd Street and gravity flow to the existing storm sewer.

- 3A-1, potential above WAC.

  Above WAC material removed from Area 3A-1 will be transported to SP-7 along the main haul road that runs across the north end of Areas 3A and 3B. Surface water collected within the area will be pumped to the ditch along B Street. The water will gravity flow through the ditch to the Tank Farm sediment trap to allow settling of sediment and then released (or pumped) from the sediment trap to the existing storm sewer system to gravity flow to SWRB.

- 3A-2 North, potential above WAC, and 3A-2 South, potential above WAC.

  The two areas will be roped off separately to allow the main haul road that runs between them to remain open. Above WAC material removed from 3A-2 North and South will be transported to SP-7. The sump pumps in these two areas will discharge to a common force main that will run along the south side of the main haul road to the ditch that runs north and south along B Street. Above WAC material located below the haul road will be removed and transported to SP-7 once the haul road is taken out of service.

- 3A-3 North, and 3A-3 South, potential RCRA for lead (based on characterization activities these areas may be above WAC areas only).

  The two areas will be roped off separately to allow the main haul road that runs between them to remain open. If these areas remain RCRA areas, they may receive in situ treatment prior to excavation activities. RCRA material removed from Area 3A-3 North and South will be transported to the Plant 1 Pad (no treatment) or the OSDF (in situ treatment). If these areas are determined to be above WAC only, the above WAC material will be transported to SP-7. The sump pumps that serve these two areas will connect to the common force main provided for 3A-2 North and South. The existing fire water line may be used to pump excavation water to the Tank Farm sediment trap. When the main haul road is removed, the portion of the haul road adjacent to these areas having RCRA material will be removed and transported to the Plant 1 Pad or the OSDF.

- 3A-4, potential RCRA area for TCE.

  On-site treatment for the TCE contaminated material will not be performed due to high treatment cost and the small estimated volume of material. The material will be packaged and transported to the Plant 1 Pad for off-site treatment and disposal. The sump pump that serves this area will discharge by force main directly to the north/south ditch along B Street.

000070

- 3A-5, potential above WAC.

  Above WAC material removed from 3A-5 will be transported to SP-7. The sump pump will discharge by force main directly to the sediment trap located on the south boundary of Area 3A. If additional settlement is required, the sediment trap south of 2nd Street will be utilized before release to the storm sewer.

Site Excavation for Area 3A (Figure 7-2 and Figure A-1)

Site excavation will consider all activities noted in Section 6.2, with emphasis on the following:

- The stormwater diversion ditch installed along the north side of the main haul road will be used during excavation. Water collected in the ditch will discharge to the existing storm drain at B Street. This will isolate runoff to the north side of the haul road and prevent it from entering the excavation on the south side of the haul road.

- Install a stormwater diversion dike along the western boundary of Area 3A.

- The main haul road can remain as long as is practical, but should be removed prior to deep excavations adjacent to the haul road.

- Excavate the deep foundations located east of the stormwater diversion dike in sequence or simultaneously with the excavation previously described. The major excavation in this area will be as follows.

  Along the western boundary, water will be pumped to the sediment trap in the southeast corner of Area 3A for the following foundations:

  10A Boiler Plant
  10B Boiler Plant Maintenance Bldg.
  10C Wet Salt Storage Bin
  20H Process Water Storage Tank

  Along the southern boundary, water will be pumped to the Area 4A sediment trap for the following foundations:

  9A Special Products Plant (Groundwater containing VOCs may be found below the south portion of Plant 9. If encountered, the water would be pumped to the WMF.)
  12A Main Maintenance Bldg.
  12B Cylinder Storage Bldg.
  12C Lumber Storage Bldg.
  12D Maintenance Bldg. Warehouse

- Complete all remaining excavation within Area 3A, including removal of the temporary sediment trap along the southeast boundary, haul roads, and soil to the grades indicated

on the excavation contours. Sequencing consideration will determine timing for haul road removal. This will require sumps and pumping within the low points of the excavated areas as needed to provide necessary dewatering. The pumps will discharge to storm sewers along the south boundary of Area 3A and along B Street.

- Several low points will be excavated during removal of contaminated soil. These low points will be connected by open channels that will allow the surface water to be collected at the lowest excavation. A sump pump will be located at the lowest excavation and will pump the collected water to the sediment traps.

- At the south end of Area 3A, a drainage swale will be constructed to direct surface flow to the east side of Area 3A.

7.2 Area 4A

Site Preparation for Area 4A (Figure 7-3)

Site preparation will consider all activities noted in Section 6.1, with emphasis on the following:

- Establish construction boundaries and access controls for 4A-1, Potential above WAC area for both technetium-99 and uranium, located in the northeast corner of Area 4A.

- Install a stormwater diversion dike along the south boundary of Area 4A.

- A sediment trap will be required at the southwest corner of Area 4A, and a surface drainage ditch will be required along B Street.

- 4A-1, potential above WAC.

  Above WAC material excavated from 4A-1 will be transported to SP-7. The suggested route will be west on 2nd Street to B Street, north on B Street to the haul road, and then west on the haul road to SP-7. The sump pump will discharge by force main to the WMF.

Site Excavation for Area 4A (Figure 7-4 and Figure A-2)

Site excavation will consider all activities noted in Section 6.2, with emphasis on the following:

- Excavation within Area 4A will begin and proceed from north to south with the site preparation sediment trap remaining in-place until all other excavation efforts within Area 4A have been completed. Because of the detection of VOCs in the groundwater under Plant 6, surface water flowing into the deep excavation that intersects the VOC groundwater must be minimized, and all water must go through Phase II treatment via WMF and BSL.

- Pumps will be located at the excavation low points and will pump surface water to the sediment trap located at the southwest corner of Area 4A.

- The deep excavation south of 2nd Street will be accomplished using 2nd Street as a haul road to the OSDF. Debris will be size reduced and hauled to the OSDF.

- Excavation of the southern half of Area 4A will use 1st Street and E Street for haul roads to the OSDF. Debris will be size reduced and hauled to the OSDF.

- In accordance with the excavation 3-D model, soil contamination in Area 4A is shown at depths deeper than the concrete foundation and/or the basement areas of the building facilities within Area 4A. The GMA is anticipated to be breached during excavation of the contaminated soil and then backfilled with clay (Section 6.3).

- Berms and perimeter ditches will be constructed around the perimeter of these deep excavation areas to prevent infiltration of surface flow. The redirected drainage will be graded to drain to a sump where it will be pumped to the Area 4A sediment trap.

- The Area 4A sediment trap will be used by Area 4B and should remain in place until excavation of Area 4B allows removal.

- After completion of excavation, the open sumps and pumping will be relocated to collect groundwater seepage and rainwater that collects in the excavation. The water will continue to be pumped to the sediment trap until the area has been precertified to FRLs. When the area is precertified to the FRLs, the water will be pumped off site by relocating the force main to the open channel on the eastside of Area 4A.

7.3 Area 3B

Site Preparation for Area 3B (Figure 7-5)

Site preparation will consider all activities noted in Section 6.1, with emphasis on the following:

- Establish construction boundaries and access controls for the potential RCRA, and potential above WAC areas. The areas are:

  1. 3B-1, potential above WAC, located along the west boundary of Area 3B; technetium -99 is the PCOC for this area.

  2. 3B-2, potential above WAC, located at the northwest corner of Area 3B, the former SP-7 above WAC Storage Area.

  3. 3B-3, potential above WAC, located along the north boundary of Area 3B, near Quonset Hut #1.

  4. 3B-4, potential RCRA, located at the northeast corner of Area 3B off the northeast corner of the KC-2 warehouse. Lead is the PCOC for this area.

  5. 3B-5, potential above WAC, located at the northwest corner of the intersection of the main haul road and B Street.

2250

6. 3B-6, potential above WAC, located south of the main haul road across from the SP-7 area.

- Use the existing concrete channel located along the north boundary of Area 3B to prevent surface water from migrating into or out of Area 3B.

- The Tank Farm sediment trap will serve as a sediment trap for surface flow from Area 3B.

- A dedicated overhead electric power line will be routed from the west to serve as the power source for Building 20A.

- 3B-1, potential above WAC.

  Above WAC material removed from Area 3B-1 will be transported to the Area 7 Above WAC Storage Area. Surface water collected in the area will be pumped to the Tank Farm sediment trap to allow settling of sediment. The water will then be released from the sediment trap to the existing storm sewer system to gravity flow to SWRB.

- 3B-2, potential above WAC.

  The above WAC material from SP-7 will be transported to the Area 7 Above WAC Storage Area. Water collected in the area will be pumped to the Tank Farm sediment trap and released to the existing storm sewer to gravity flow to SWRB.

- 3B-3, potential above WAC.

  The above WAC material will be transported to the Area 7 Above WAC Storage Area. Open sumps and pumping will control surface water runoff. A collection low point will be excavated at the south end of the area and the water will be pumped to the Tank Farm sediment trap. The water will be released to the existing storm sewer to gravity flow to SWRB.

  3B-4, potential RCRA area for lead.

  This area may receive in situ treatment prior to excavation activities. The RCRA material removed from the area will be transported to the Plant 1 Pad (no treatment) or the OSDF (in situ treatment). Open sumps and pumping will control surface water runoff. A collection low point will be excavated at the southwest corner of the area, and the water will be pumped to the Tank Farm sediment trap. The water will be released to the existing storm sewer to gravity flow to the SWRB.

- 3B-5, potential above WAC.

  The above WAC material will be transported to the Area 7 Above WAC Storage Area. Open sumps and pumping will control surface water runoff. A collection low point will

be excavated at the south end of the area and the water will be pumped to the Tank Farm sediment trap. The water will be released to the existing storm sewer to gravity flow to the SWRB.

- 3B-6, potential above WAC.

  The above WAC material will be transported to the Area 7 Above WAC Storage Area. Open sumps and pumping will control surface water runoff. A collection low point will be excavated at the southeast corner of the area, and the water will be pumped to the Tank Farm sediment trap. The water will be released to the existing storm sewer to gravity flow to the SWRB.

Site Excavation for Area 3B (Figure 7-6 and Figure A-3)

Site excavation will consider all activities noted in Section 6.2, with emphasis on the following:

- Excavation of contaminated material within Area 3B will be contingent on the shutdown of the Plant 1 Pad. Containerized materials that are to be shipped off site are currently being stored on the Plant 1 Pad. If during the planned sequence of activities for remediation, the Plant 1 Pad operations delay excavation of Area 3B, revisions to the sequence and remediation activities will be required. See Section 6.7 for a complete discussion on this alternative.

- Transportation of contaminated material to the OSDF will be south on B Street to 1st Street, then east to the OSDF. The main haul road to B Street will be used for excavation located north of the main haul road. In order to use the existing and main haul roads, excavation of the northern portion of Area 3B will begin first and proceed south. Demolition of the main haul road will progress as the site excavation continues south.

- Sump pumps will be located at the lowest level in the excavation to pump the collected water to the sediment trap. These low points will be connected by open channels that will reduce the number of required pumps.

7.4 Area 4B

Site Preparation for Area 4B (Figure 7-7)

Site preparation will consider all activities noted in Section 6.1, with emphasis on the following:

- Establish construction boundaries and access controls for potential RCRA, and potential above WAC areas. The areas are:

  1. 4B-1, potential above WAC - Plant 2, located in the north section of Area 4B.

  2. 4B-2, potential RCRA - abandoned sump located in the southwest section of Area 4B. Barium is the PCOC in this area.

000075

3. 4B-3, potential above WAC - located in the east central section of Area 4B.

4. 4B-4, potential above WAC - located in the southeast section of Area 4B.

- Install a diversion dike along portions of the south and east boundaries of Area 4B.

- Install a sediment trap along the south boundary of Area 4B.

- Materials excavated from the potential RCRA and potential above WAC areas will be transported to the Area 7 Above WAC Storage Area by using the existing roads.

- 4B-1, potential above WAC.

  The above WAC material will be transported to the Area 7 Above WAC Storage Area. Open sumps and pumping will control surface water runoff. A collection low point will be excavated in the south end (midway) of the area. All water entering the excavation will be pumped to the WMF because of the detection of VOCs in the areas groundwater.

- 4B-2, potential RCRA area for barium.

  Due to the small estimated volume of RCRA material (e.g., less than 50 cubic ft) in situ treatment is not anticipated. The excavated material from the sump area will be transported to the Plant 1 Pad. A surface flow control sump pump area (collection low point) will be excavated in the south end (midway) of the area, and the water will be pumped to the sediment trap along the south boundary of Area 4B.

- 4B-3, potential above WAC.

  The above WAC material will be transported to the Area 7 Above WAC Storage Area. Open sumps and pumping will control surface water runoff. A collection low point will be excavated at the south end of the area. The sediment trap in the southwest corner of Area 4A will be used for water pumped from 4B-3.

- 4B-4, potential above WAC.

  The above WAC material will be transported to the Area 7 Above WAC Storage Area. Open sumps and pumping will control surface water runoff. A collection low point will be excavated at the south end of the area and the water will be pumped to the sediment trap along the south boundary of Area 4B.

<u>Site Excavation for Area 4B (Figure 7-8 and Figure A-4)</u>

Site excavation will consider all activities noted in Section 6.2, with emphasis on the following:

- The GMA is anticipated to be breached during excavation of the contaminated soil below the Pilot Plant. These excavations will receive the clay fill as discussed in Section 6.3.

- Use the stormwater diversion dikes installed during site preparation located along the south boundary of Area 4B. The dikes will be extended along a portion of the eastside of Area 4B. These dikes will prevent surface water from flowing into Area 5 and will prevent flow of water into Area 4B from the east. Water collected along the dikes will be pumped to the sediment trap. Surface water and seepage collected during mass excavation of the contaminated materials will be collected at the low point elevations and pumped to the sediment trap. Existing roads within Area 4B will be adequate for providing access to the excavation areas, and contaminated material will be transported to the OSDF and OMTA using 1st Street.

7.5 Area 5

Site Preparation for Area 5 (Figure 7-9)

Site preparation will consider all activities noted in Section 6.1, with emphasis on the following:

- Soil containing COCs greater than WAC and hazardous constituents have not been identified for Area 5. If, during future sampling, soil is determined to contain COCs above WAC or hazardous constituents, then the appropriate RCRA or above WAC areas will be delineated.

- Existing roads will be used for transporting soil and debris from excavated areas to the OSDF or OMTA.

- SWRB will serve as a sediment trap for Area 5.

- Stormwater diversion dikes will be installed along the north side of the parking lot and west of D Street. The dike will collect surface water at the southwest corner of the substation where it will be pumped into an existing storm sewer.

Site Excavation for Area 5 (Figure 7-10 and Figure A-5)

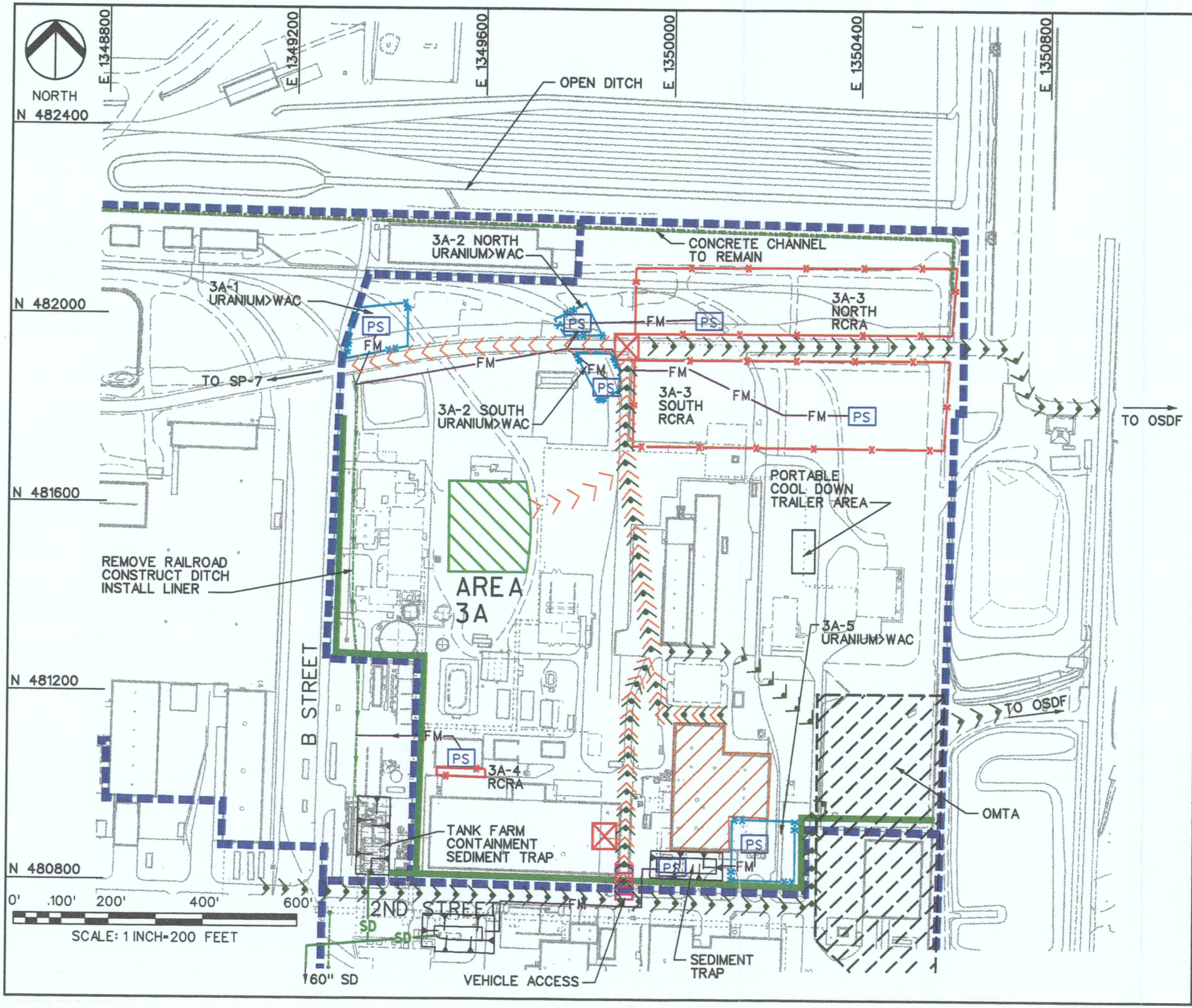
Site excavation will consider all activities noted in Section 6.2, with emphasis on the following:

- Use existing stormwater diversion dikes constructed during the site preparation to contain surface water and excavation seepage. Water will collect at the southwest corner of Area 5 and be pumped to the SWRB.

- Drainage channels will route the water collected in the excavations for 11, 28A, 28B, 44E, and 53A to the southwest corner of Area 5. The collected water will be pumped to the SWRB.

- Existing roads within Area 5 will provide access for the removal of contaminated material. The haul road constructed for transporting material from Area 4B to the OSDF will also be used for Area 5.

- Protect and keep in place during excavation the existing main electrical substation (16A), the trailers along the south boundary, the Emergency Response Building, and the Vehicle Repair Building.



LEGEND

- POTENTIAL RCRA
- 2250
- POTENTIAL ABOVE WAC
- WHEEL WASH STATION (OPTIONAL)
- DEWATERING AREA FOR SOIL W/ FREE LIQUIDS
- HAUL ROAD TO OSDF AND OSDF MATERIAL TRANSFER AREA
- HAUL ROAD TO SP-7
- SEDIMENT TRAP
- AREA BOUNDARY
- PUMP STATION
- FORCE MAIN
- EXISTING STORM DRAIN
- CONTRACTOR'S STOCKPILE & SIZE REDUCTION
- STORM WATER DIVERSION DIKE
- DITCH LINE
- EXISTING CONCRETE CHANNEL

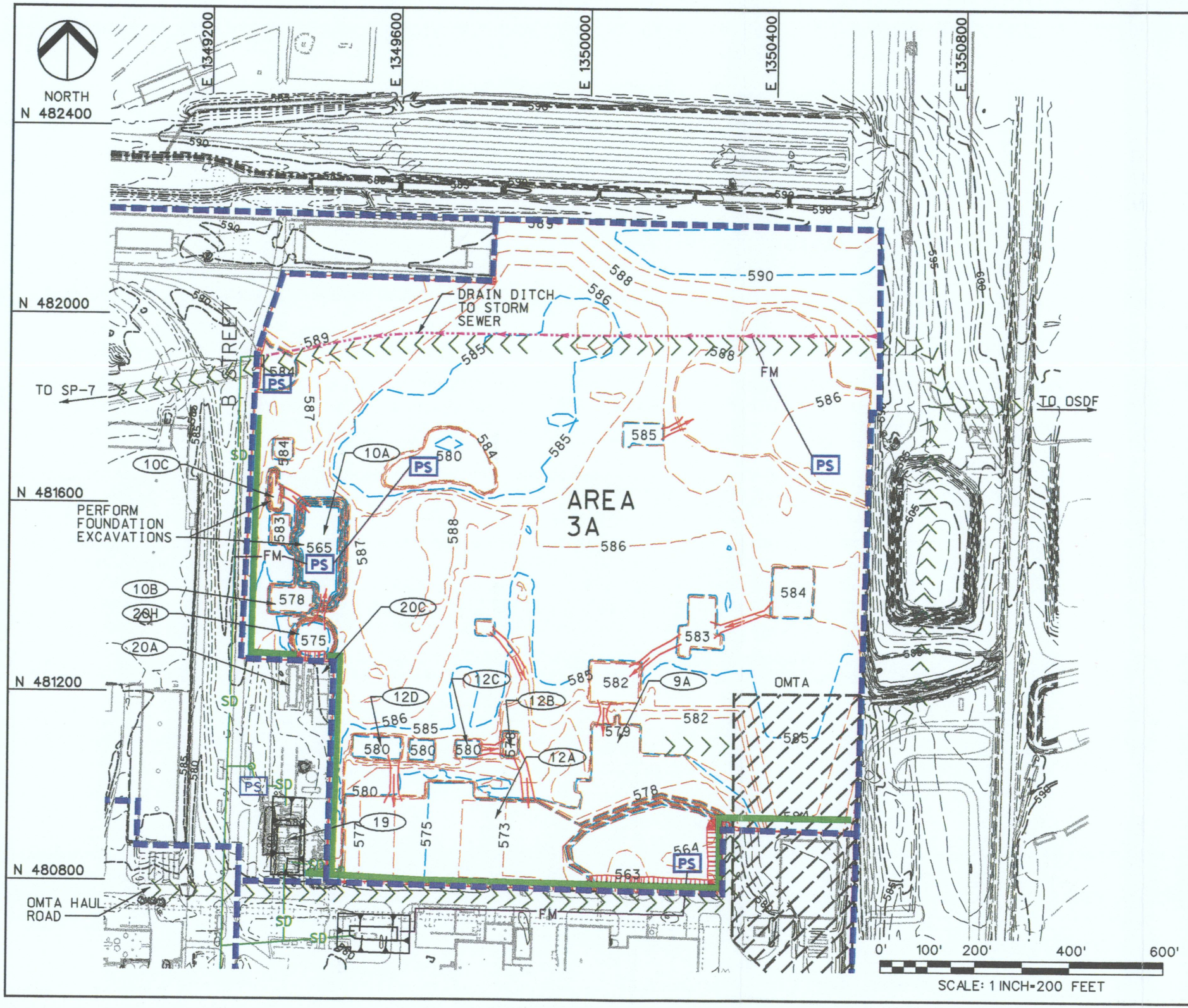
TITLE

FIGURE 7-1

SITE PREPARATION FOR AREA 3A

000079

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY

2250

EXISTING MAJOR CONTOUR (5FT INTERVAL) — 585

EXISTING MINOR CONTOUR (1FT INTERVAL) — 584

EXCAVATION MAJOR CONTOUR (5FT INTERVAL) — 585

EXCAVATION MINOR CONTOUR (1FT INTERVAL) — 584

HAUL ROAD

FORCE MAIN — FM

STORM DRAIN — SD

PUMP STATION — PS

STORM WATER DIVERSION DIKE

DIVERSION DITCH

SEDIMENT TRAP

BUILDING NUMBER — 20A

2H:1V SLOPE LINE

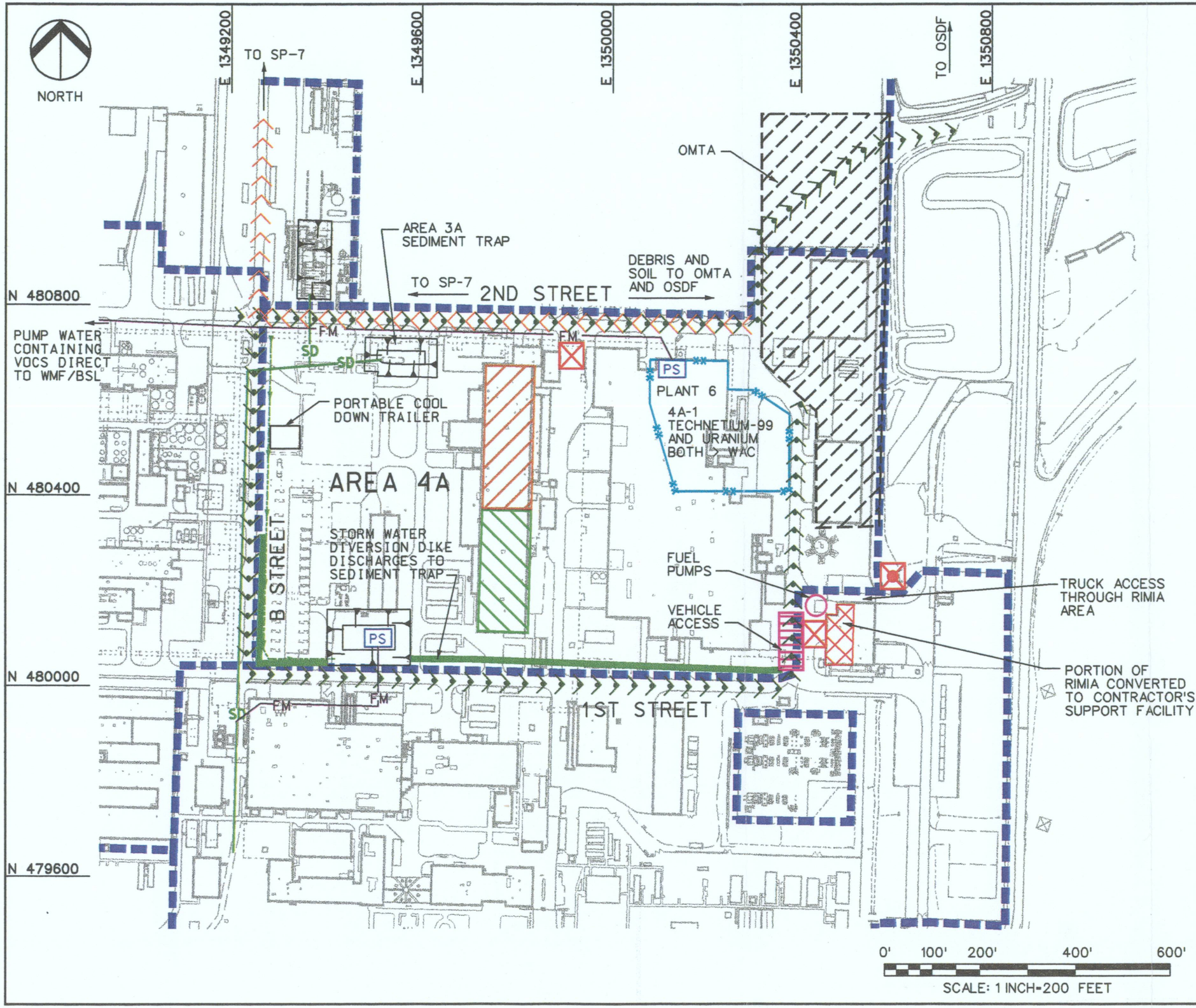
DRAINAGE CHANNEL

TITLE

FIGURE 7-2
SITE EXCAVATION FOR AREA 3A

000080

FLUOR DANIEL FERNALD



LEGEND

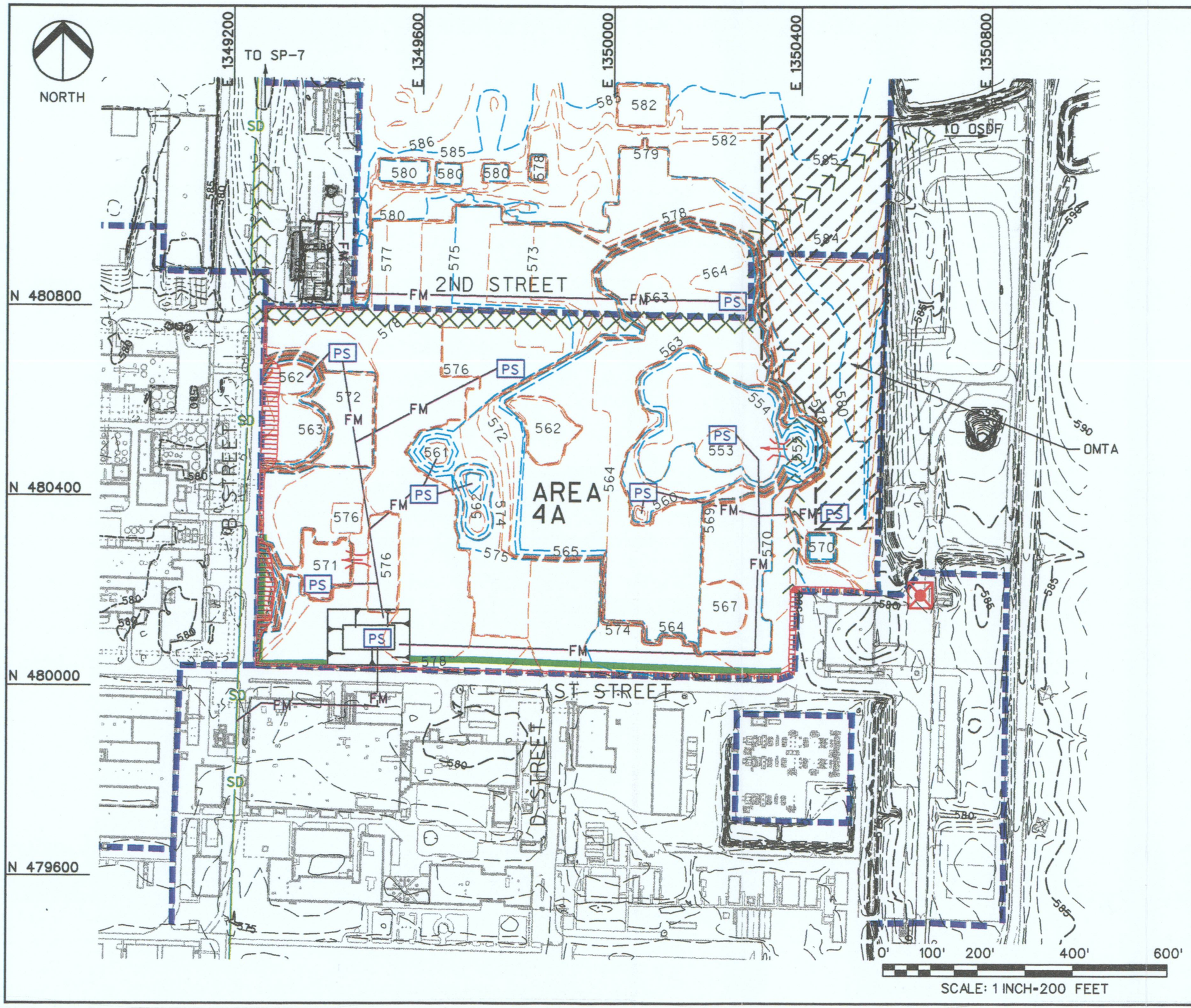
- POTENTIAL ABOVE WAC
- FREE RELEASE WASH FACILITY 2250
- WHEEL WASH STATION (OPTIONAL)
- DEWATERING AREA FOR SOIL W/ FREE LIQUIDS
- HAUL ROAD TO OSDF AND OSDF MATERIAL TRANSFER AREA
- HAUL ROAD TO SP-7
- SEDIMENT TRAP
- AREA BOUNDARY
- PUMP STATION (PS)
- FORCE MAIN (FM)
- EXISTING STORM DRAIN (SD)
- CONTRACTOR'S STOCKPILE & SIZE REDUCTION
- STORM WATER DIVERSION DIKE
- DITCH LINE

TITLE

FIGURE 7-3
SITE PREPARATION FOR AREA 4A

000081

FLUOR DANIEL FERNALD



LEGEND

AREA BOUNDARY

2250

EXISTING MAJOR CONTOUR (5FT INTERVAL) — 585

EXISTING MINOR CONTOUR (1FT INTERVAL) — 584

EXCAVATION MAJOR CONTOUR (5FT INTERVAL) — 585

EXCAVATION MINOR CONTOUR (1FT INTERVAL) — 584

HAUL ROAD

FORCE MAIN — FM

STORM DRAIN — SD

PUMP STATION — PS

FREE RELEASE WASH FACILITY

STORM WATER DIVERSION DIKE

DIVERSION DITCH

SEDIMENT TRAP

2H:1V SLOPE LINE

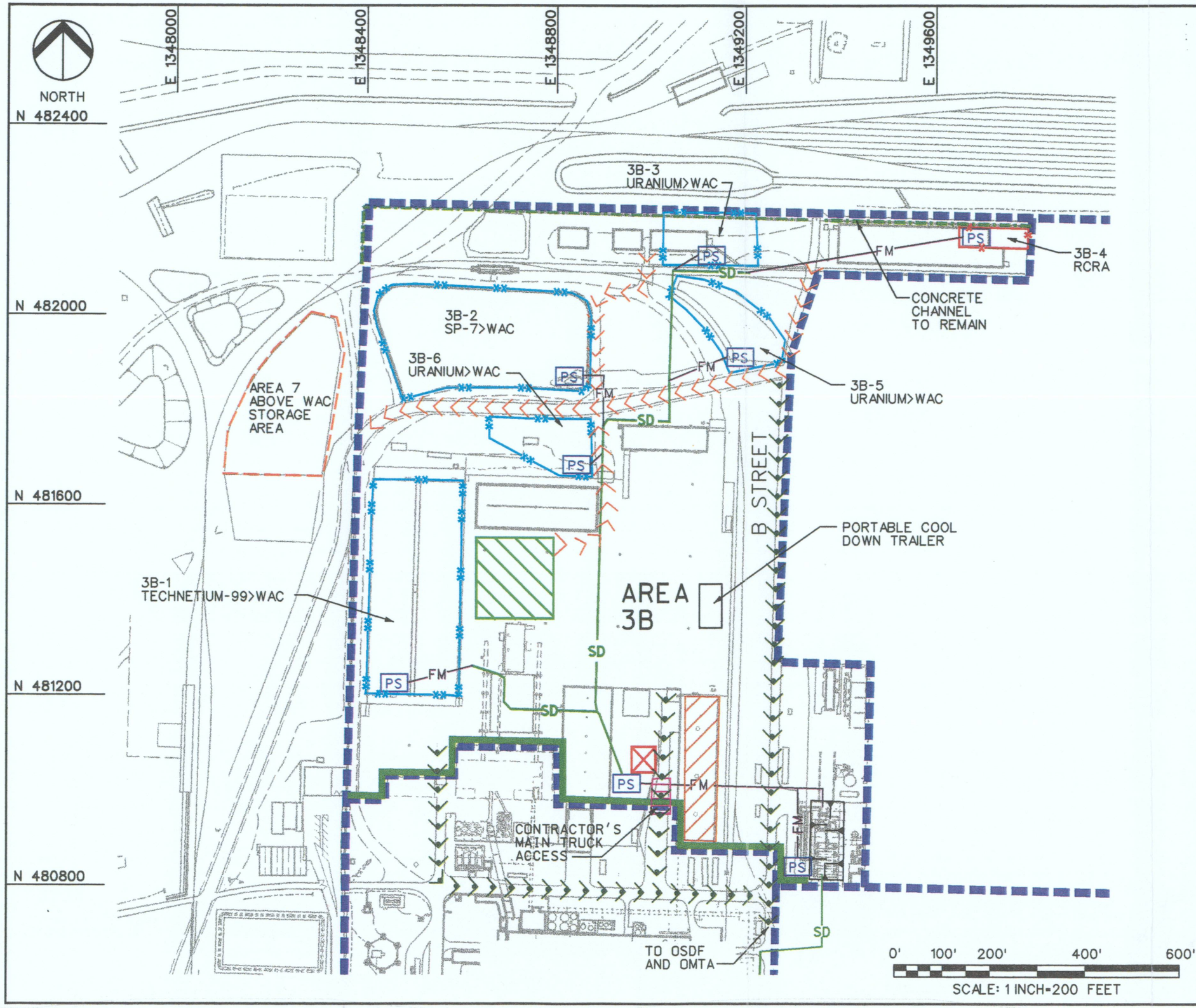
TITLE

FIGURE 7-4

SITE EXCAVATION FOR AREA 4A

000082

FLUOR DANIEL FERNALD



2250 LEGEND

- POTENTIAL RCRA
- POTENTIAL ABOVE WAC
- WHEEL WASH STATION (OPTIONAL)
- DEWATERING AREA FOR SOIL W/ FREE LIQUIDS
- HAUL ROAD TO OSDF AND OSDF MATERIAL STORAGE AREA
- HAUL ROAD TO AREA 7 ABOVE WAC STORAGE AREA
- SEDIMENT TRAP
- AREA BOUNDARY
- PUMP STATION (PS)
- FORCE MAIN (FM)
- EXISTING STORM DRAIN (SD)
- CONTRACTOR'S STOCKPILE & SIZE REDUCTION
- STORM WATER DIVERSION DIKE
- EXISTING CONCRETE CHANNEL
- LIMITS OF AREA 7 ABOVE-WAC STORAGE AREA

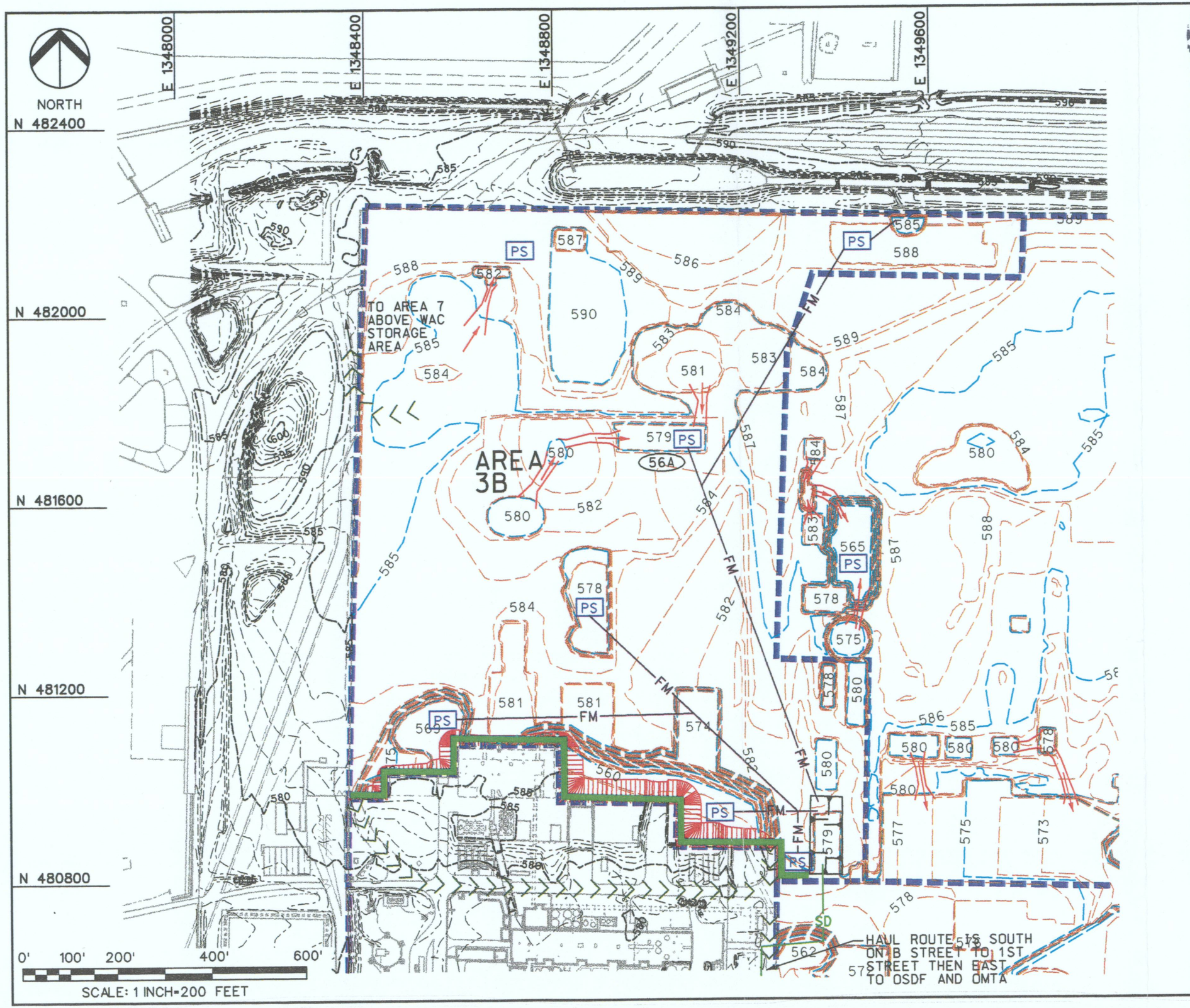
TITLE

FIGURE 7-5

SITE PREPARATION FOR AREA 3B

000083

FLUOR DANIEL FERNALD



2250 LEGEND

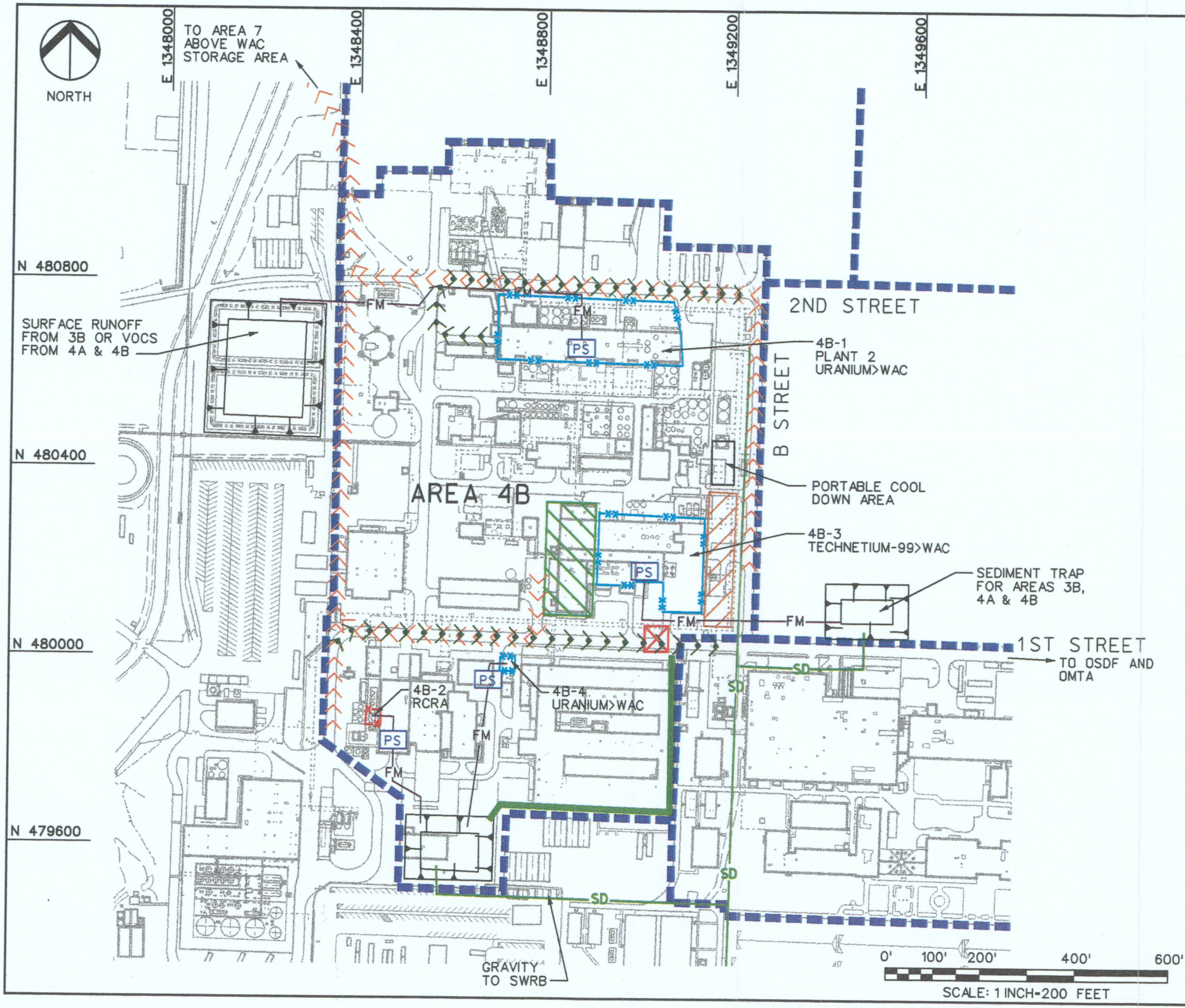
- AREA BOUNDARY
- EXISTING MAJOR CONTOUR (5FT INTERVAL) — 585
- EXISTING MINOR CONTOUR (1FT INTERVAL) — 584
- EXCAVATION MAJOR CONTOUR (5FT INTERVAL) — 585
- EXCAVATION MINOR CONTOUR (1FT INTERVAL) — 584
- HAUL ROAD
- FORCE MAIN — FM
- STORM DRAIN — SD
- PUMP STATION — PS
- STORM WATER DIVERSION DIKE
- DIVERSION DITCH
- SEDIMENT TRAP
- BUILDING NUMBER — 56A
- 2H:1V SLOPE LINE
- DRAINAGE CHANNEL

TITLE

FIGURE 7-6
SITE EXCAVATION FOR AREA 3B

000084

FLUOR DANIEL FERNALD



2250 LEGEND

- POTENTIAL RCRA
- POTENTIAL ABOVE WAC
- WHEEL WASH STATION (OPTIONAL)
- DEWATERING AREA FOR SOIL W/ FREE LIQUIDS
- HAUL ROAD TO OSDF AND OSDF MATERIAL STORAGE AREA
- HAUL ROAD TO AREA 7 ABOVE WAC STORAGE AREA
- SEDIMENT TRAP
- AREA BOUNDARY
- PUMP STATION (PS)
- FORCE MAIN (FM)
- EXISTING STORM DRAIN (SD)
- STORM WATER DIVERSION DIKE
- CONTRACTOR'S STOCKPILE & SIZE REDUCTION

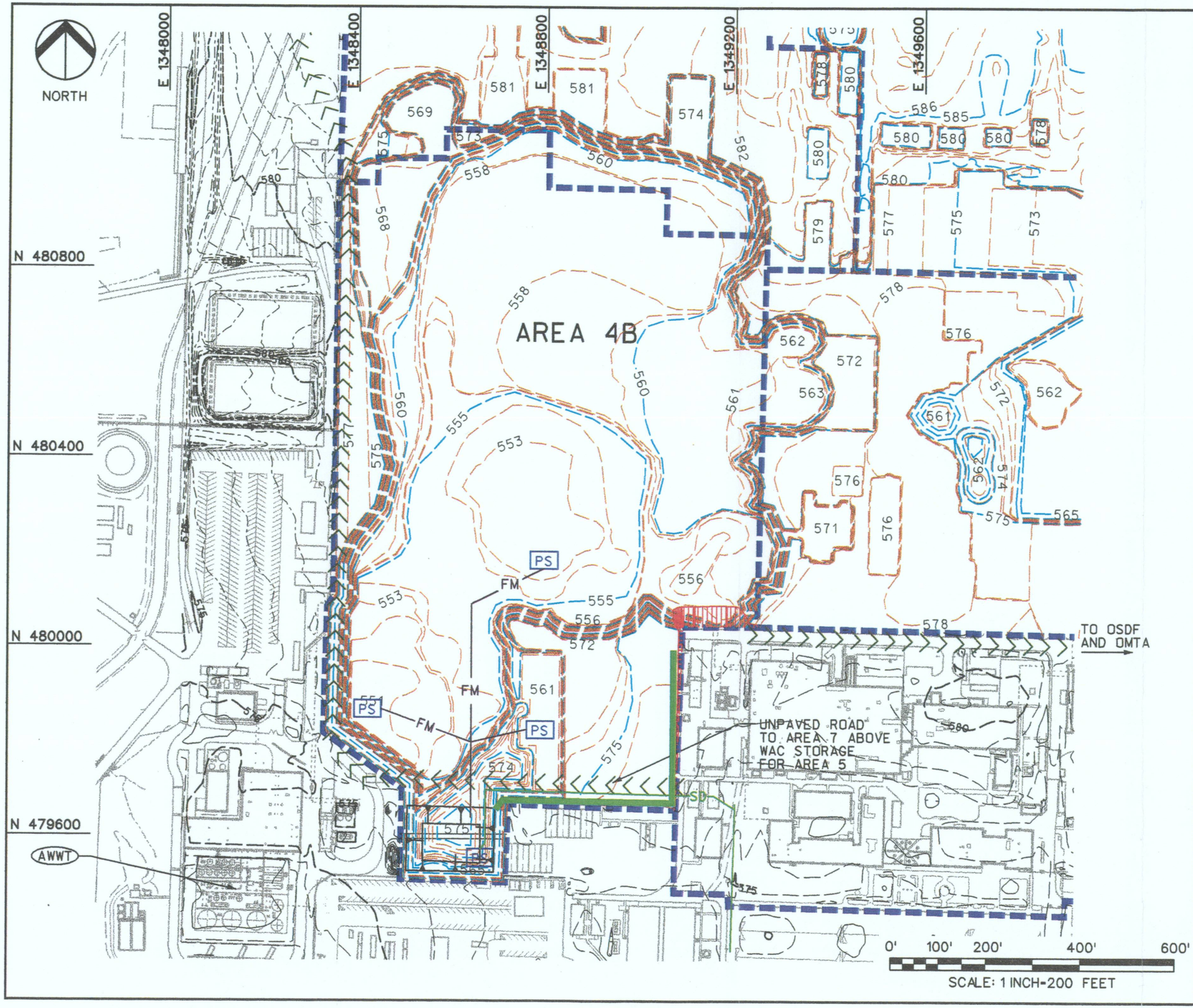
TITLE

FIGURE 7-7

SITE PREPARATION FOR AREA 4B

000085

FLUOR DANIEL FERNALD



2250 LEGEND

AREA BOUNDARY

EXISTING MAJOR CONTOUR (5FT INTERVAL) — 585

EXISTING MINOR CONTOUR (1FT INTERVAL) — 584

EXCAVATION MAJOR CONTOUR (5FT INTERVAL) — 585

EXCAVATION MINOR CONTOUR (1FT INTERVAL) — 584

HAUL ROAD

FORCE MAIN — FM

STORM DRAIN — SD

PUMP STATION — PS

STORM WATER DIVERSION DIKE

DIVERSION DITCH

SEDIMENT TRAP

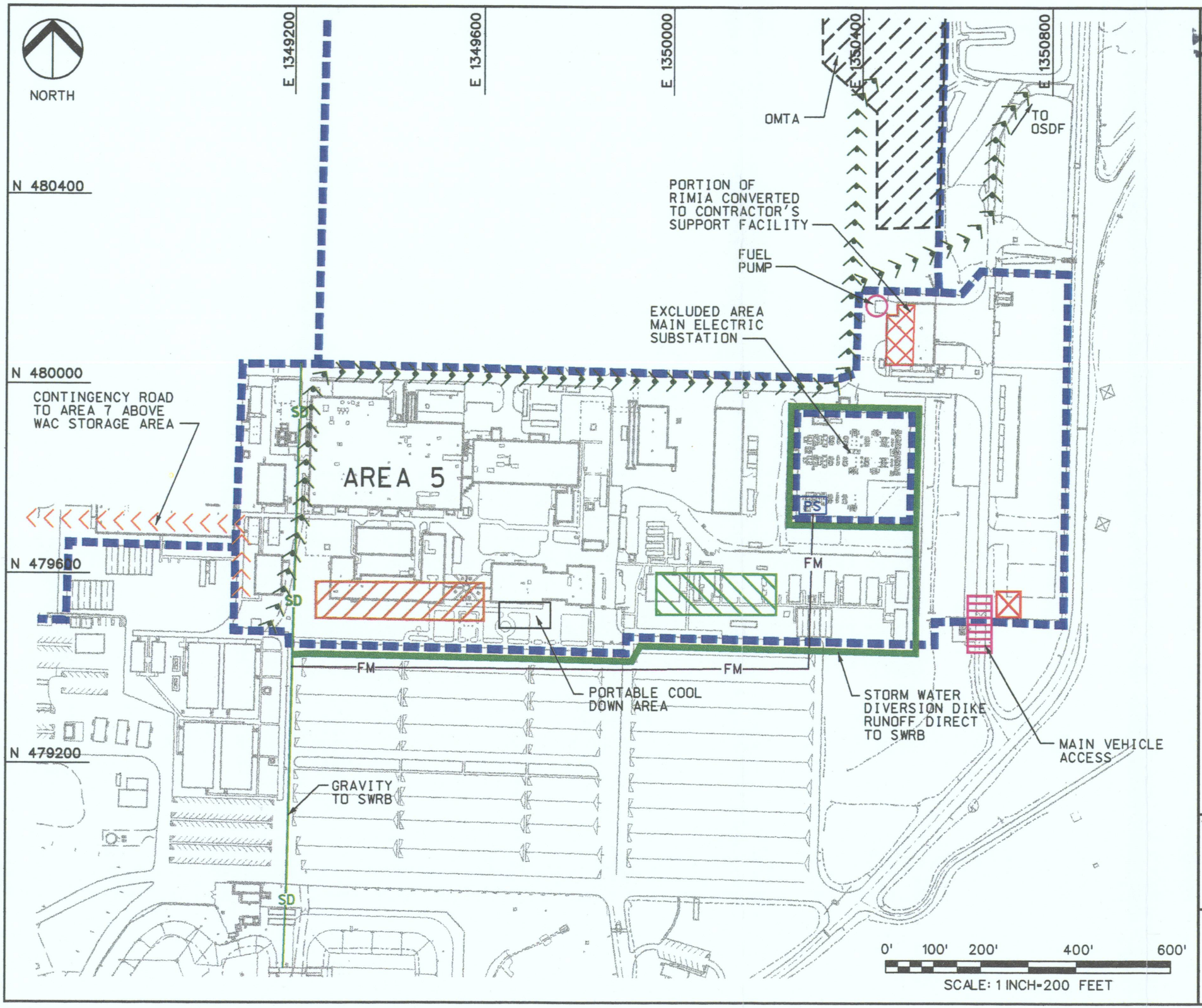
2H:1V SLOPE LINE

TITLE

FIGURE 7-8
SITE EXCAVATION FOR AREA 4B

000086

FLUOR DANIEL FERNALD



2250 LEGEND

- DEWATERING AREA FOR SOIL W/ FREE LIQUIDS
- WHEEL WASH STATION (OPTIONAL)
- HAUL ROAD TO OSDF OR OSDF MATERIAL TRANSFER AREA
- HAUL ROAD TO AREA 7 ABOVE WAC STORAGE AREA
- AREA BOUNDARY
- PUMP STATION (PS)
- FORCE MAIN (FM)
- EXISTING STORM DRAIN (SD)
- CONTRACTOR'S STOCKPILE & SIZE REDUCTION
- STORM WATER DIVERSION DIKE

TITLE

FIGURE 7-9
SITE PREPARATION FOR AREA 5

CC0087

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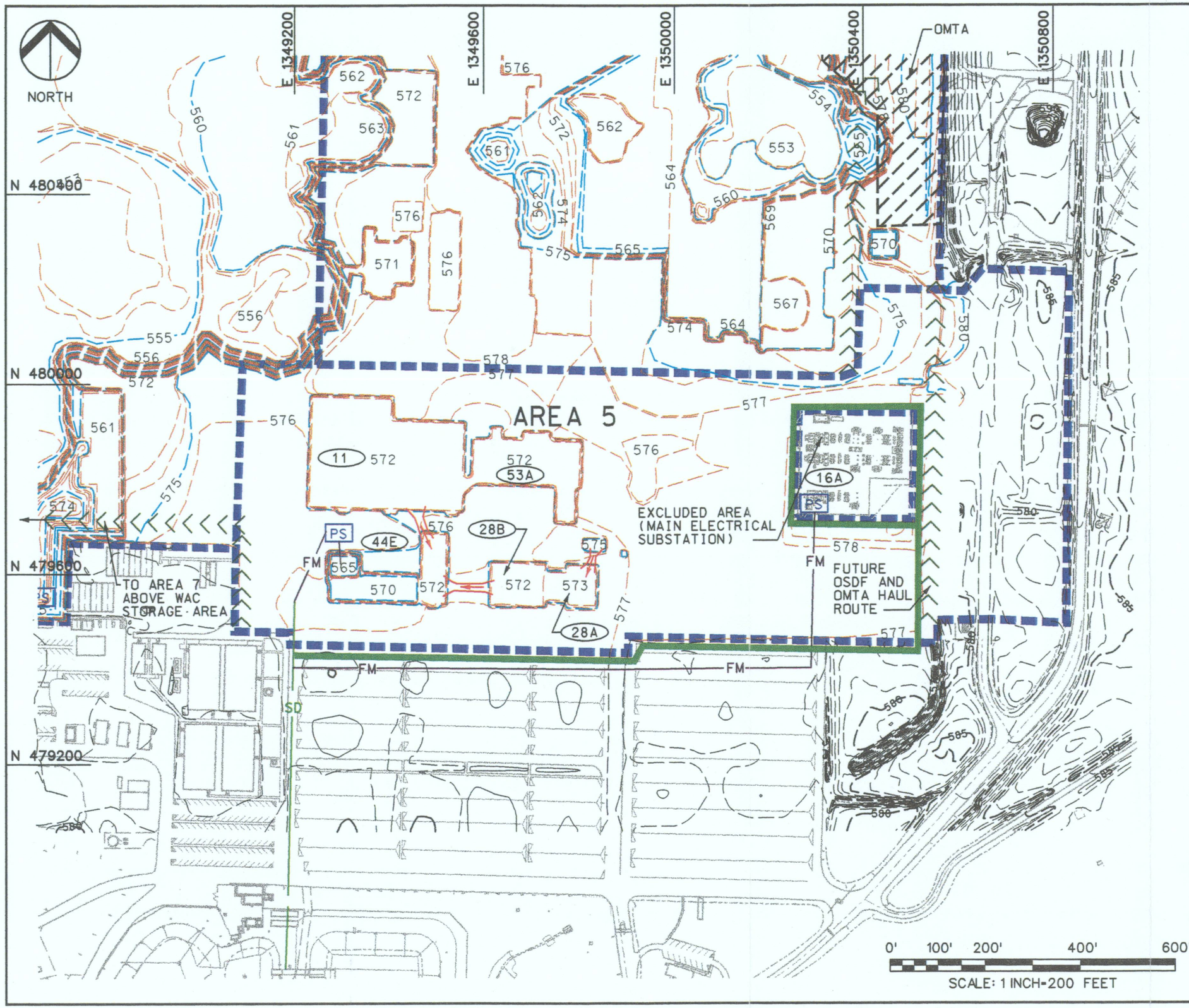


2250 LEGEND

AREA BOUNDARY

EXISTING MAJOR CONTOUR (5FT INTERVAL) — 585
EXISTING MINOR CONTOUR (1FT INTERVAL) — 584

EXCAVATION MAJOR CONTOUR (5FT INTERVAL) — 585
EXCAVATION MINOR CONTOUR (1FT INTERVAL) — 584

HAUL ROAD

FORCE MAIN — FM

STORM DRAIN — SD

PUMP STATION — PS

STORM WATER DIVERSION DIKE

DIVERSION DITCH

SEDIMENT TRAP

BUILDING NUMBER — 20A

TITLE

FIGURE 7-10
SITE EXCAVATION FOR
089088 AREA 5

FLUOR DANIEL FERNALD

8.0 Cost Estimate

The cost estimate provides an estimated construction cost (ECC) of all activities required to successfully complete the at- and below-grade remediation of the Former Plant Area. The estimate includes direct construction costs that would typically be incurred by a general contractor in performance of this work. FDF will determine other project costs (OPC) required to support this work as well as contractor indirect costs, safety and training, engineering, escalation, and contingency. OPC, engineering, and other indirect costs are indicated on the FDF estimate summary sheet included in Appendix C.

The estimate format matches the project work breakdown structure (WBS). The WBS segregates the work by remediation area at Level 3. The fourth level WBS provides logical work packages for each area. The WBS is shown on Figure 8-1.

Soil excavation quantities and clay fill quantities used in the estimate were derived from the project 3-D computer model. Quantities for other materials were extracted from the OU 3 RI/FS.

The estimate is based on the assumption that three fixed-price contracts will be awarded. Work is assumed to be performed using commercially available equipment and standard construction methods.

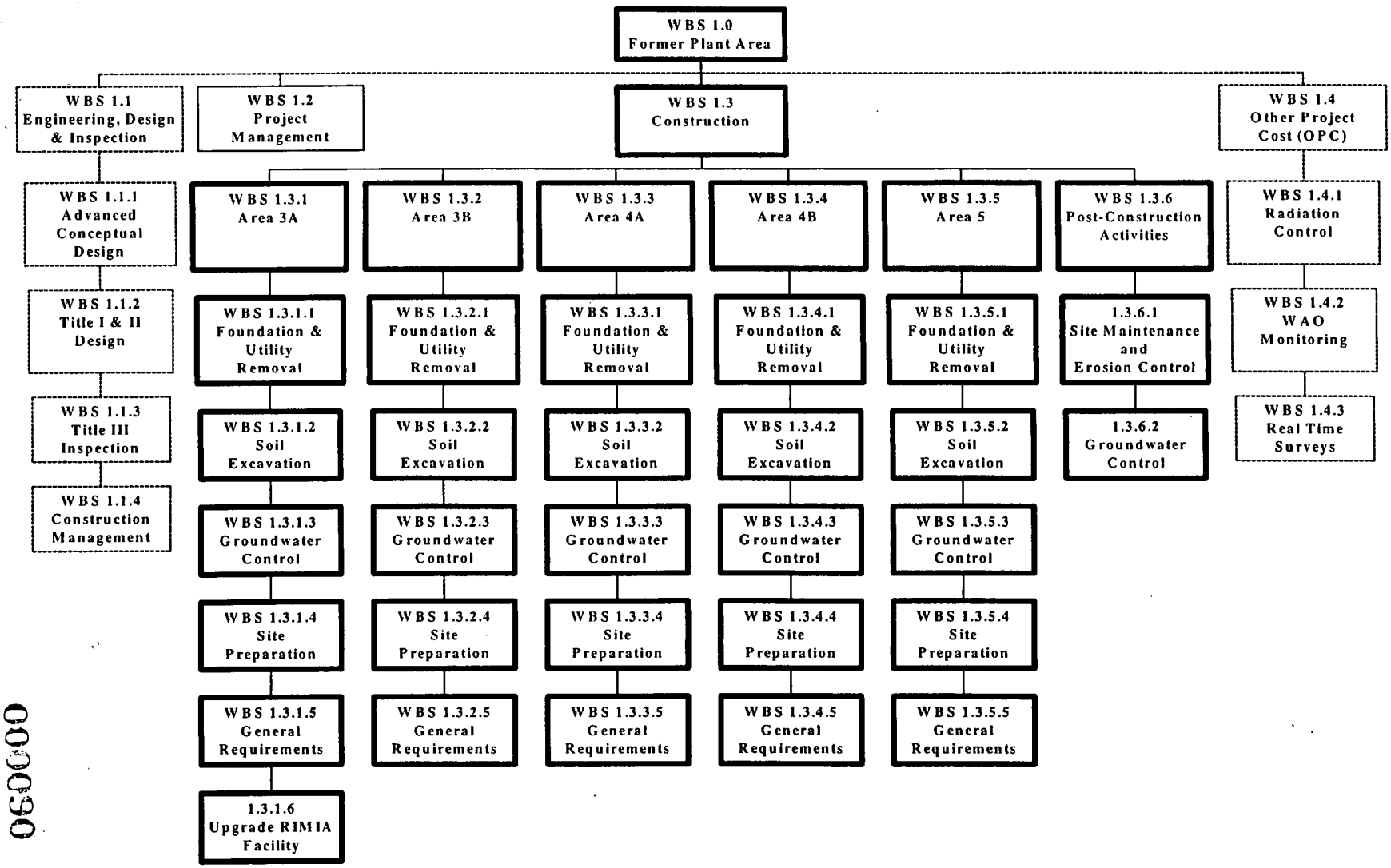
The following table summarizes the ECC by WBS Level 3.

Table 8-1
Estimated Construction Cost Summary

WBS Element	Estimated Construction Cost *
1.3.1 Area 3A	$ 8,933,000
1.3.2 Area 3B	$ 4,727,000
1.3.3 Area 4A	$ 6,339,000
1.3.4 Area 4B	$11,002,000
1.3.5 Area 5	$ 3,654,000
1.3.6 Post Construction Activities	$ 642,000
Estimated Construction Cost	**$35,297,000**

* Note: Totals do not include OPC, indirects, safety and training, engineering, escalation, or contingency costs.

FIGURE 8 - 1
Work Breakdown Structure for Cost Estimate
Advanced Conceptual Design - Former Plant Area



Dashed lines indicate FDF supplied cost elements

000090

Assumptions used to prepare the ECC are outlined here.

General Assumptions

1. This is an ECC.
2. The estimate is structured according to the WBS illustrated in Figure 8-1.
3. Three fixed-price contractors (FPCs) selected by competitive bid will perform the work. The work will be performed using commercially available earthmoving equipment and standard construction methods.
4. The FPC will rent construction equipment. Rental rates are based on U.S. Army Corps of Engineers data or quotes from area equipment dealers.
5. The labor rates are subcontract composite wage rates for 1999 as supplied by FDF cost engineering.
6. Direct costs are estimated using the Automated Estimating System. Direct costs are tabulated on the FDF estimate summary sheets in Appendix C. The summary sheets apply all project indirect costs per FDF guidelines.
7. The assumed construction start date is April 2001.
8. Costs are included for the renovation of the RIMIA facility.
9. The contractors will provide "cool down trailers" inside the general excavation areas. Portable generators will supply power to the trailers.

Work Element Specific Assumptions

1. The potential above WAC and potential RCRA soil volumes are based on the areas shown on the Section 7 figures.
2. Per FDF, all concrete located inside the potential above WAC and potential RCRA areas will be cleaned before disposition in the OSDF. The excavation contractor will not clean the concrete.
3. The potential RCRA soil (not including TCE soil) will be treated by in situ methods. Upon completion of this treatment the soil can be disposed at the OSDF.
4. The OU 3 RI/FS was used as a basis for all quantities other than the soil. The soil quantity was calculated using the project 3-D model.
5. The quantities shown in the OU 3 RI/FS are assumed to be bank cubic ft (BCF) or in-place (no swell applied).
6. The material quantities contained in OU 3 RI/FS were tabulated into each respective excavation area by building number. The only exception to this was the road quantities, which were evenly distributed between Areas 3A, 3B, 4A, 4B and 5.
7. The clay backfill quantity was computed using the project 3-D model. The volume was computed by multiplying the projected area of intrusion at the GMA interface times 5 ft. The estimate assumes that the clean clay fill material, for this backfill, will come from the active excavation.
8. The following conversion factors were used in quantity calculations for BCY and loose cubic yards (LCY).
   - Soil: 1 BCY = 1.25 LCY = .84 fill cubic yards (FCY)
   - Concrete: 1 BCY = 1.5 LCY
9. New haul road lengths are based on the ACD figures.

10. Production rates for this work are based on various estimating manuals such as: *Earthmoving Equipment Production Rates and Costs*, *R.S. Means Estimating Manual*, and *Richardson's Estimating Standards*.
11. The construction season is assumed to be from April through December or 9 months. Therefore, the winter shutdown season will be January through March or 3 months.
12. During winter shutdown, only minimal work will be performed (e.g., erosion control and dewatering).
13. The average work week is assumed to be 5 days per week at 10 hours per day, with a 50-minute work hour.
14. The following labor job factors will be applied to cover such things as breaks, transport in and out of work areas, personnel monitoring, dressout, tool-up and tool-down, etc:
    - A 26 percent job factor was applied to cover loss time due to personal protective equipment (PPE) dressout requirements and breaks and transport of workers in the general excavation areas.
    - A 34 percent job factor was applied to cover loss time due to personal protective equipment (PPE) (two layers) dressout requirements, breaks and transport of workers in the above WAC and potential RCRA areas.
    - A 4 percent job factor was applied for heat stress.
15. This estimate assumes all of the heavy equipment will be cleaned and demobilized at the end of the construction season and then remobilized at the beginning of the next construction season.
16. It was assumed that all of the heavy equipment needed for this project can be located and rented by the FPC from the adjoining states.
17. The same contractor before closeout will demolish all temporary facilities or structures built during construction.
18. All workers will use RIMIA as the entry point to the excavation areas.
19. Each contractor will be responsible for providing transportation for workers from RIMIA to excavation areas and back to RIMIA. This will be required at start of shift, morning break, lunch break, afternoon break, and end of shift.
20. Per FDF, only the workers outside of enclosed equipment will be required to have PPE in the general excavation areas. It is assumed workers in enclosed equipment will be in company supplied coveralls.
21. PPE materials will be supplied by FDF.
22. All above WAC soils will be excavated, loaded in dump trucks, and hauled to the Area 7 Above WAC Storage Area (for 3B, 4B and 5).
23. Per FDF, the OSDF can receive six trucks per hour per open cell (maximum of three) from this project.
24. Per FDF, trucks will not be decontaminated during excavation and hauling activities.
25. This estimate does not include costs for any delays caused by the contractor responsible for placement of waste at the OSDF.
26. According to the materials lists in the OU 3 RI/FS, the underground piping is considered to be made of clay. Therefore, it is assumed that the clay pipe will be removed during soil excavation. It is also assumed that the clay pipe will be broken and crushed during excavation because of its age and type.
27. This estimate assumes that all existing above-ground waste and debris (stockpiles and containers) will be removed by others before this contract.
28. All water from dewatering and pumping operations will be transported or pumped to holding ponds before water treatment at AWWT. FDF will pay for treatment costs.

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29. Most all concrete will be removed using conventional methods such as hoe rams, shears, and crushers mounted on hydraulic excavators. An exception to this will be large subsurface foundations, where an allowance has been included for drilling and blasting. Once the large foundations are cracked and broken by blasting, the pieces will be size-reduced with the conventional equipment.
30. Concrete rubble will be loaded in Caterpillar D 400E articulated dump trucks and hauled to the OSDF.
31. Costs are included for erosion control from the start of interim remediation until the start of final remediation. This duration is assumed to be 12 months beyond the completion of Area 5.
32. Costs are included for pumping of groundwater from the start of interim remediation until start of final remediation.
33. Costs are included to construct maintenance roads, which will allow the erosion control crews access to the "Certified Areas" during the period between interim and final remediation.
34. Haul production rates for soil are based on using Caterpillar D 400E articulated dump trucks.
35. Per the LGT design team, assume that all above WAC and RCRA soil must be dewatered before hauling to Area 7 Above WAC Storage Area.
36. Per FDF, assume that 30 percent of the total volume of general excavation soil must be dewatered.
37. The TCE-contaminated soil will be excavated and packaged into a shipping container. The containers will be hauled to the Plant 1 Pad for disposition by others.
38. The haul production rates are based on using the struck capacity to prevent spillage during transport over haul roads.

The exclusions used to prepare the ECC are outlined here.

1. Costs for packaging and disposal of the above WAC soil are not included in this estimate.
2. This estimate does not include the cost for placement (spread and compaction) of the soil and concrete at the OSDF.
3. Costs for treatment of the wastewater are not included in this estimate.
4. Costs have not been included for the removal of any existing waste stockpiles and boxes located within the boundaries of this project.
5. The masonry quantities shown in the OU 3 RI/FS were not included in the cost estimate. It was assumed that this material will be removed during building removal.
6. FDF will calculate contingency.
7. FDF will calculate the escalation.

9.0 Schedule

The construction schedule on Figure 9-1 reflects work activities identified in the ECC for the at- and below-grade remediation of the Former Plant Area. Activity start and completion dates were provided by FDF. Based on the assumptions of this estimate there exists a problem during fiscal year (FY) 04 and FY05. This schedule requires that a greater quantity of soil be hauled and placed at the OSDF than can be reasonably performed based on FDF guidelines. A list of

potential changes is noted here for consideration. The feasibility and cost impact of these changes have not been evaluated.

This schedule follows the project WBS shown in Figure 8-1. The following table summarizes schedule activities by WBS Level 3.

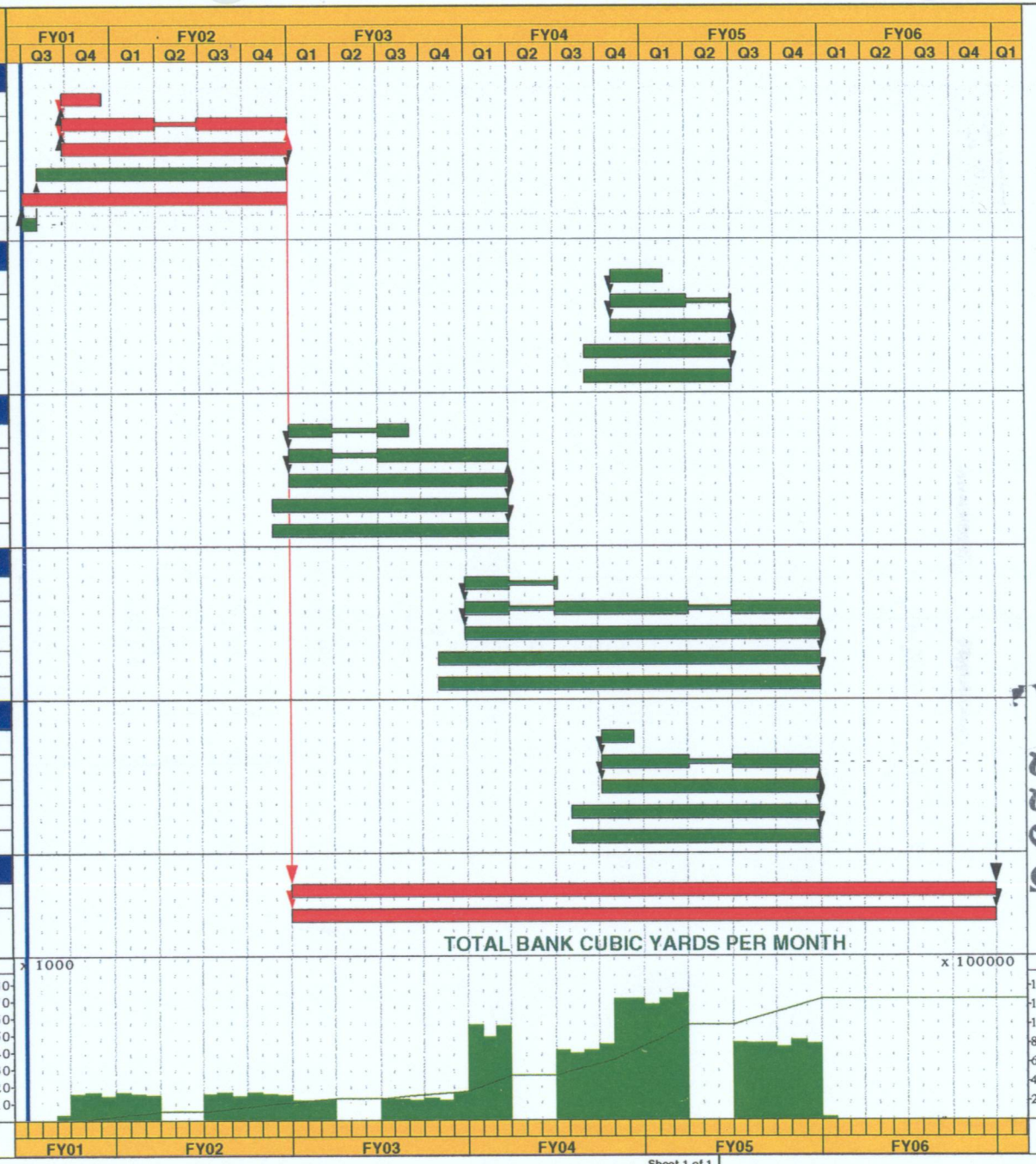
Table 9-1
Schedule Summary

WBS Element	Excavation Start Date	Excavation Finish Date
1.3.1 Area 3A	25 JUN 2001	30 SEP 2002
1.3.2 Area 3B	02 AUG 2004	04 APR 2005
1.3.3 Area 4A	03 OCT 2002	30 DEC 2003
1.3.4 Area 4B	29 SEP 2003	03 OCT 2005
1.3.5 Area 5	06 JUL 2004	28 SEP 2005
1.3.6 Post-Construction Activities	01 OCT 2002	29 SEP 2006

Potential changes to reduce the schedule duration include the following:

- Add a second work shift to increase daily production and reduce haul road congestion. This would require the OSDF to be operated during 2nd shift hours.
- Increase the work week from five days per week to six days per week to increase weekly production. This would increase cost due to overtime premiums.
- Crush concrete foundations to allow material to be used as fill. This would require a crusher and related facilities be added to project. This would provide additional fill material that in turn would allow additional debris to be placed.
- Review methods of construction that would increase the daily productivity. Possibly establish a closer point where workers could take breaks.
- Increase the waste acceptance rate into the OSDF. Possibly by adding additional the OSDF crews or additional entrance.
- Increase the number of the OSDF cells that can be open simultaneously.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Area 3A				
1311	3A - Foundation & Utility Removal	59	25JUN01*	13SEP01
1312	3A - Soil Excavation	267	25JUN01	30SEP02
1313	3A - Groundwater Control	331*	25JUN01	30SEP02
1314	3A - Site Preparation	370	01MAY01	30SEP02
1315	3A - General Requirements	391*	02APR01	30SEP02
1316	3A - Upgrade RIMIA Facility	21	02APR01	30APR01
Area 3B				
1321	3B - Foundation & Utility Removal	77	02AUG04*	16NOV04
1322	3B - Soil Excavation	112	02AUG04	04APR05
1323	3B - Groundwater Control	176*	02AUG04	04APR05
1324	3B - Site Preparation	216	07JUN04	04APR05
1325	3B - General Requirements	216	07JUN04	04APR05
Area 4A				
1331	4A - Foundation & Utility Removal	113	03OCT02*	06JUN03
1332	4A - Soil Excavation	260	03OCT02	30DEC03
1333	4A - Groundwater Control	324*	03OCT02	30DEC03
1334	4A - Site Preparation	350	28AUG02	30DEC03
1335	4A - General Requirements	350	28AUG02	30DEC03
Area 4B				
1341	4B - Foundation & Utility Removal	75	29SEP03*	09APR04
1342	4B - Soil Excavation	397	29SEP03	03OCT05
1343	4B - Groundwater Control	526*	29SEP03	03OCT05
1344	4B - Site Preparation	566	04AUG03	03OCT05
1345	4B - General Requirements	566	04AUG03	03OCT05
Area 5				
1351	5 - Foundation & Utility Removal	48	06JUL04*	09SEP04
1352	5 - Soil Excavation	258	06JUL04	28SEP05
1353	5 - Groundwater Control	322*	06JUL04	28SEP05
1354	5 - Site Preparation	365	06MAY04	28SEP05
1355	5 - General Requirements	365	06MAY04	28SEP05
Post - Construction				
1361	Site Maintenance & Erosion Control	1,044*	01OCT02	29SEP06
1362	Groundwater Control	1,044*	01OCT02	29SEP06



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Resource/Cost Profile Legend

Resource: BCY

Total early usage per Month (Current Estimate)

Current estimate curve

Detail scale (left): X 1000

Cumulative scale (right): X 100000

Project Start	23MAR99
Project Finish	29SEP06
Data Date	02APR01
Run Date	13MAY99

Early Bar

Progress Bar

Critical Activity

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FDF1

Sheet 1 of 1

FIGURE 9-1

Fluor Daniel Fernald

ACD - Former Plant Area

0522

10.0 References

L- 2250

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DOE, 1998b, "Geotechnical Engineering Report for Project Order 177 A-E Support Services for Geotechnical Investigation of the Former Plant Area," Draft Revision C, FEMP, DOE, Fernald Area Office, Cincinnati, OH, March.

ODNR, 1996, "Ohio's Standards for Stormwater Management Land Development and Urban Stream Protection," Second Edition.

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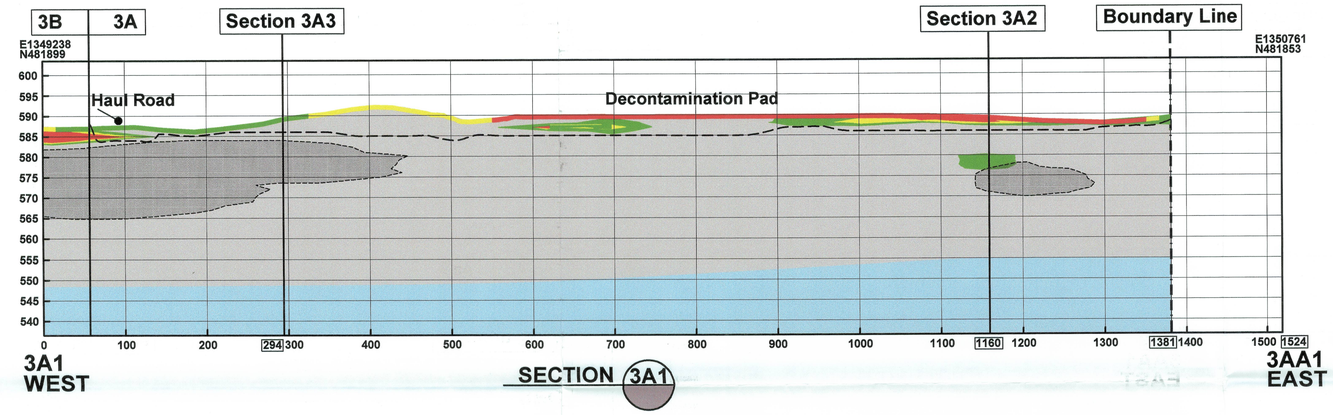
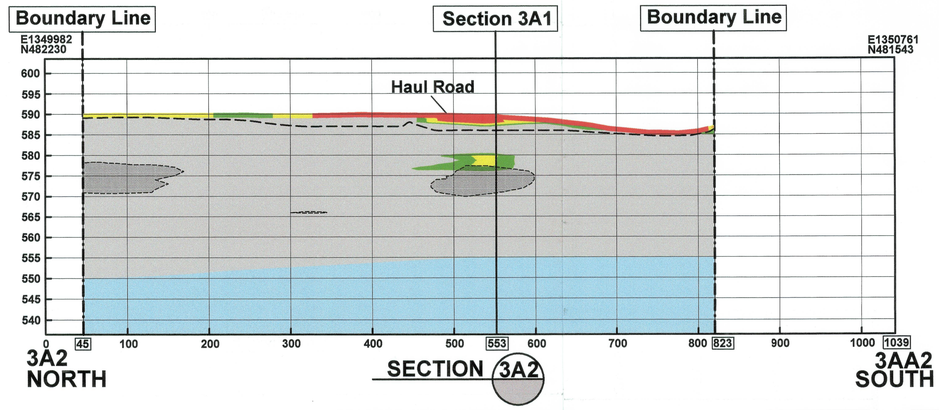
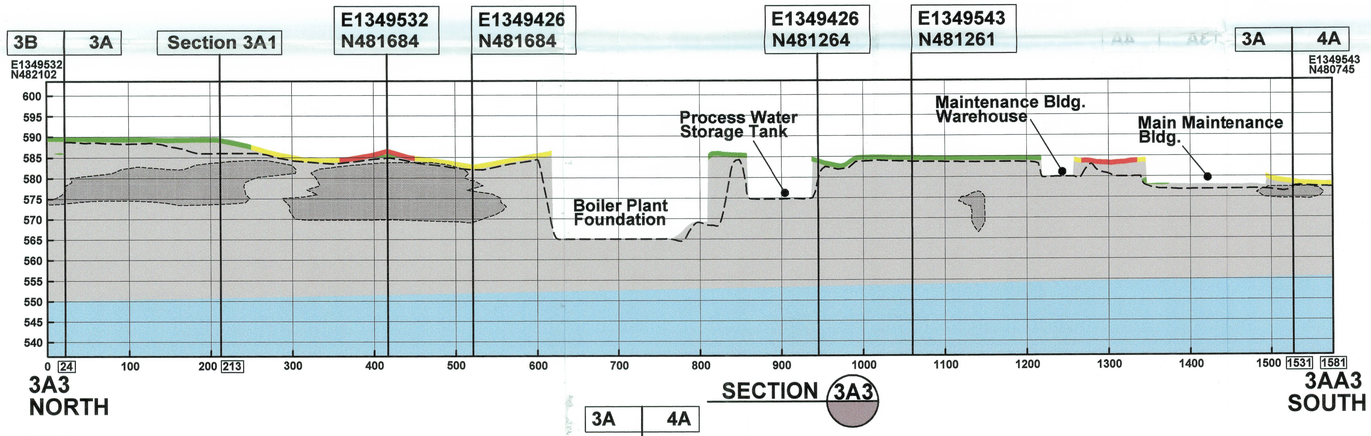
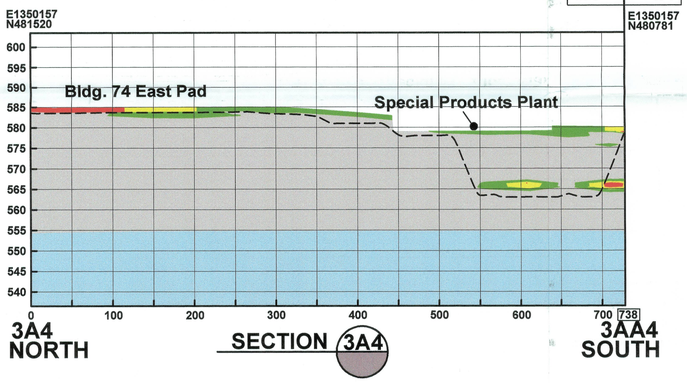
APPENDIX A

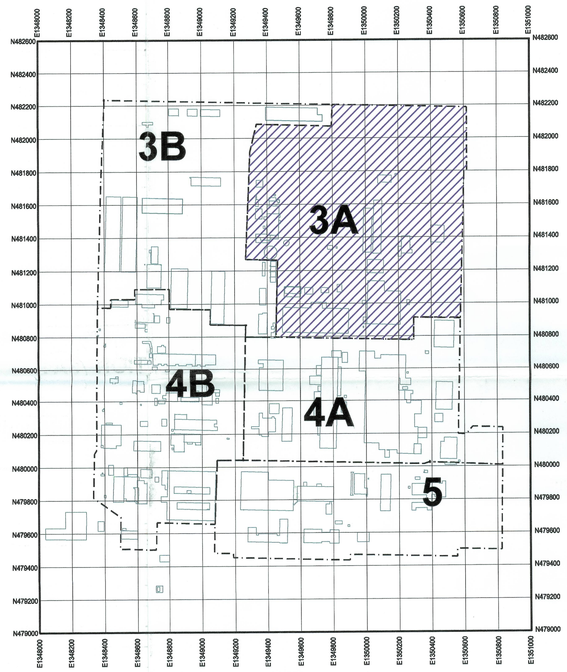
3-D Model Figures



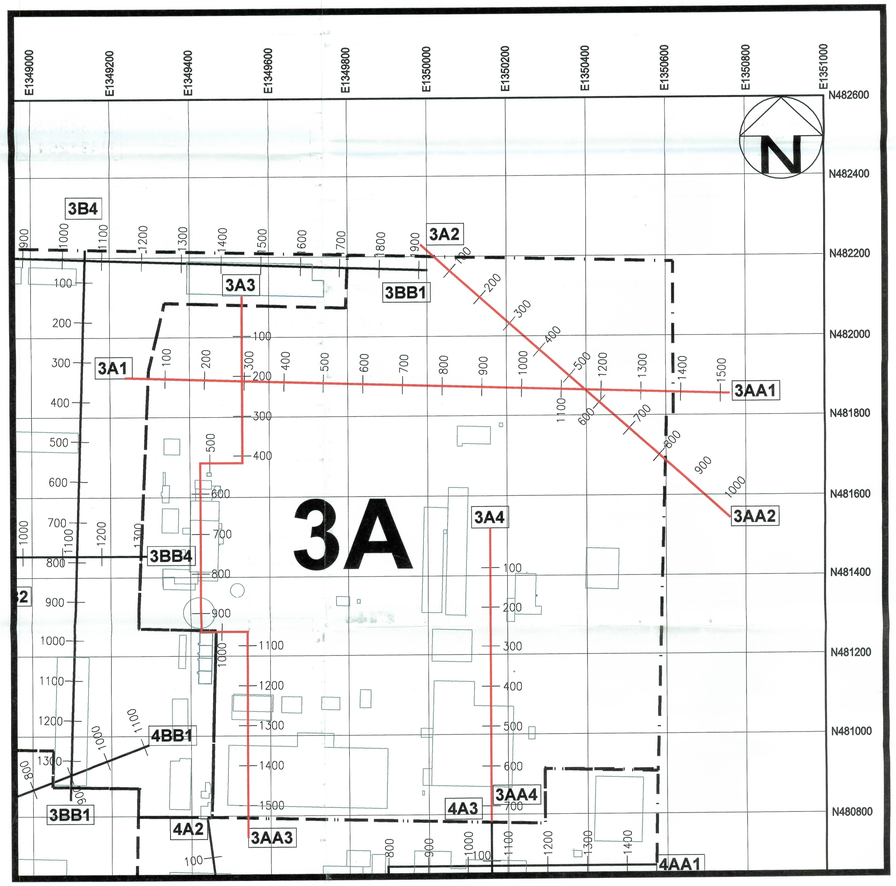








AREA 3A KEY PLAN



AREA 3A PLAN

COLOR LEGEND
TOTAL URANIUM CONCENTRATION

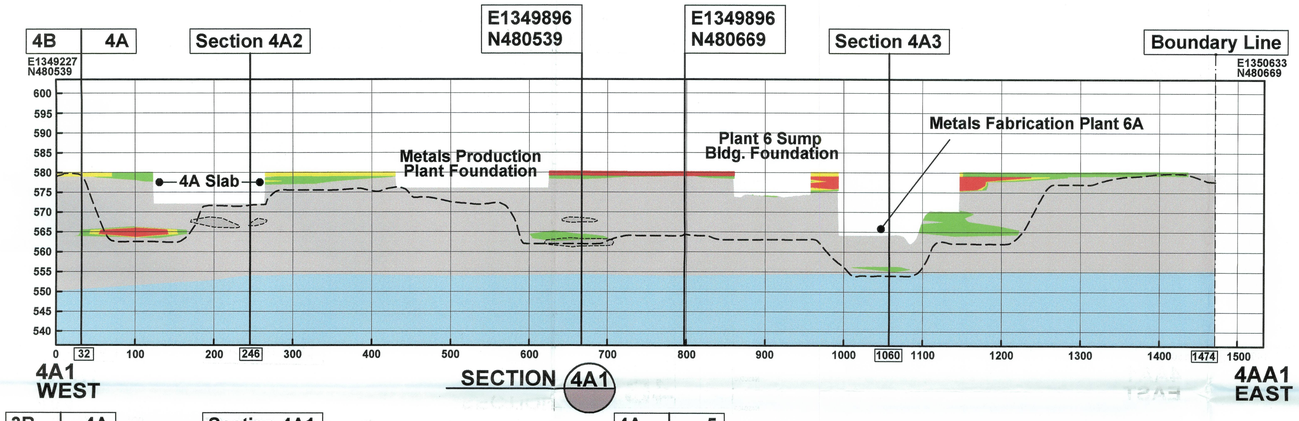
- ≥ 1030 mg/kg
- ≥ 82 mg/kg
- ≥ 50 mg/kg
- ≥ 20 mg/kg

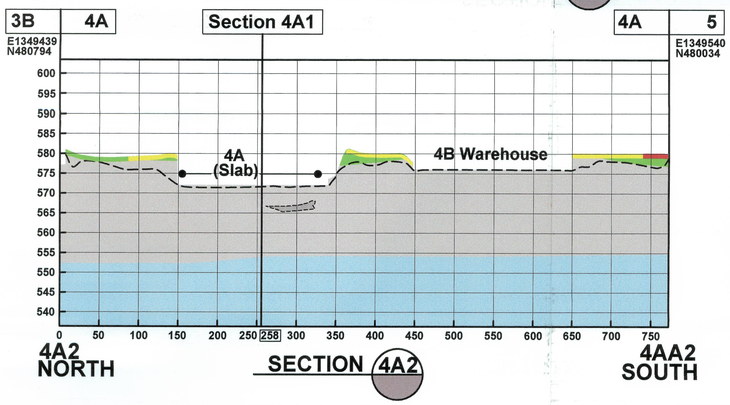
- SILT/SAND LENSES
- CLAY
- GMA
- EXCAVATION PROFILE

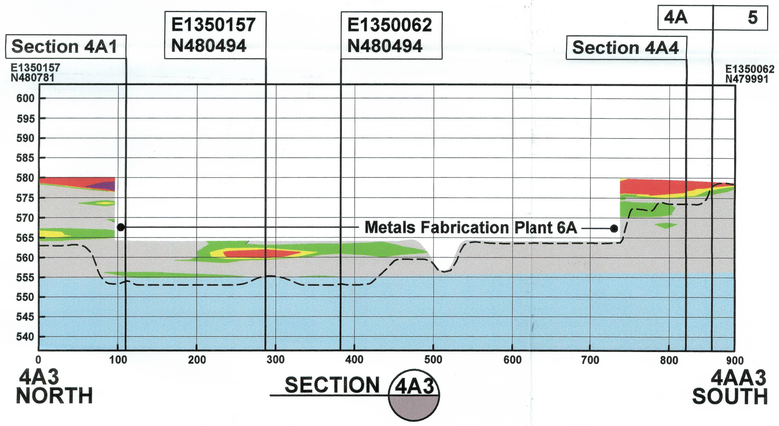
AREA 3A CROSS SECTIONS

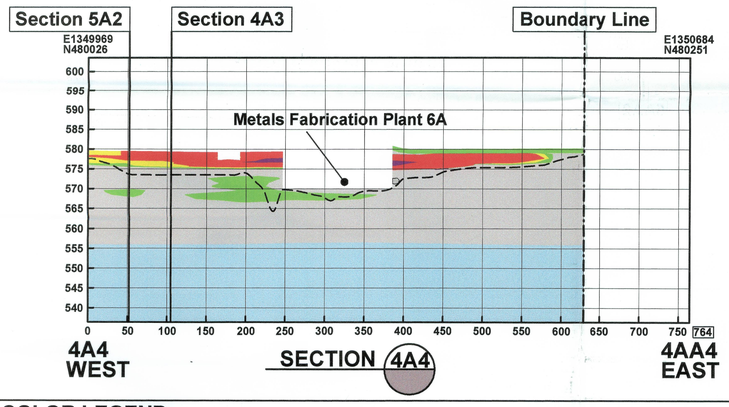
FIGURE A

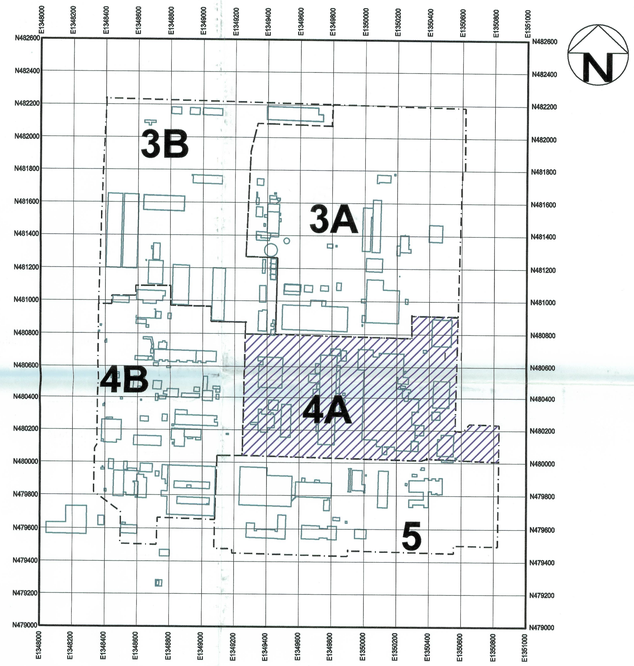
MAY 24, 1999 FINAL ISSUE



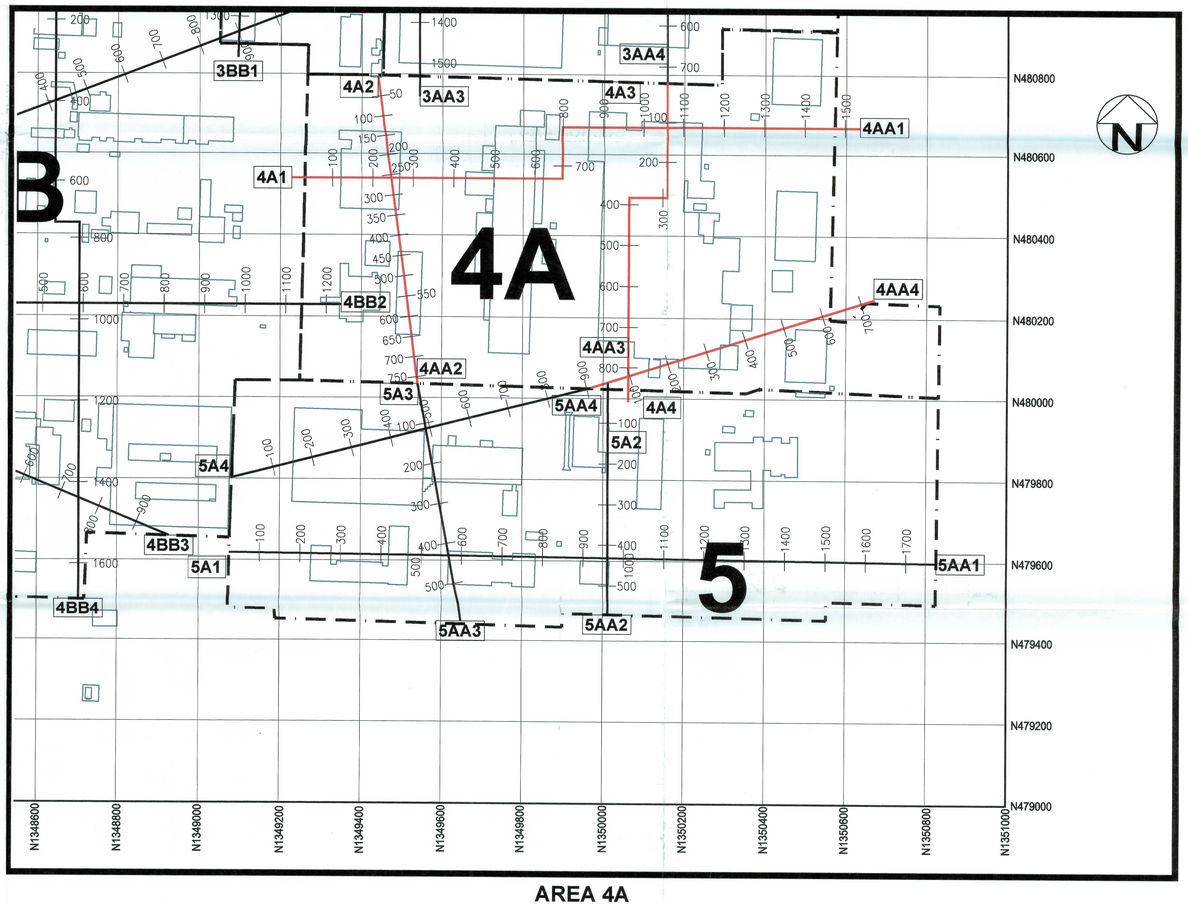








AREA 4A KEY PLAN



AREA 4A

COLOR LEGEND
TOTAL URANIUM CONCENTRATION

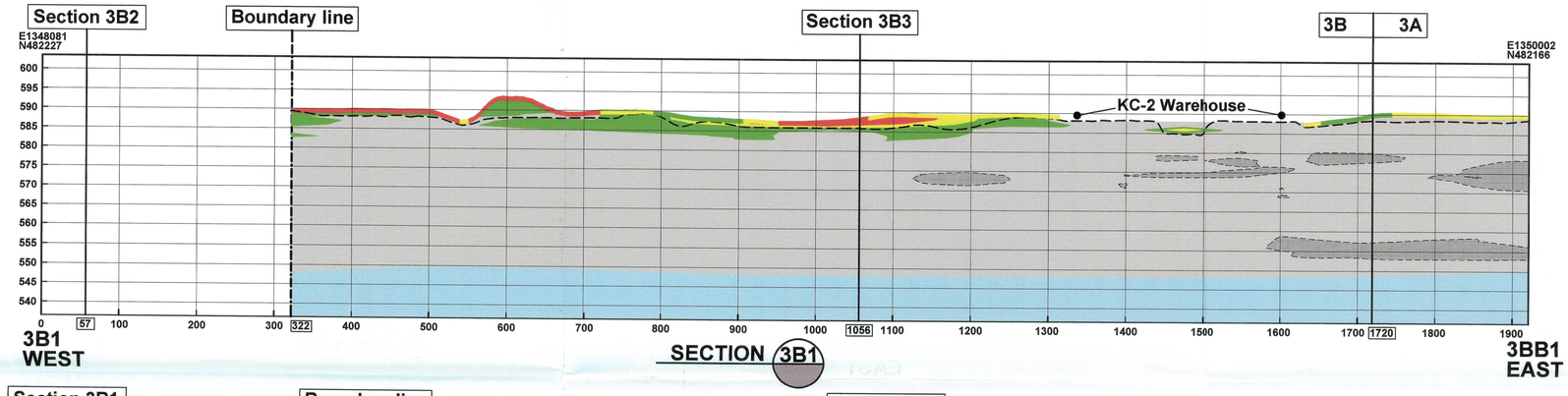
- ≥ 1030 mg/kg
- ≥ 82 mg/kg
- ≥ 50 mg/kg
- ≥ 20 mg/kg

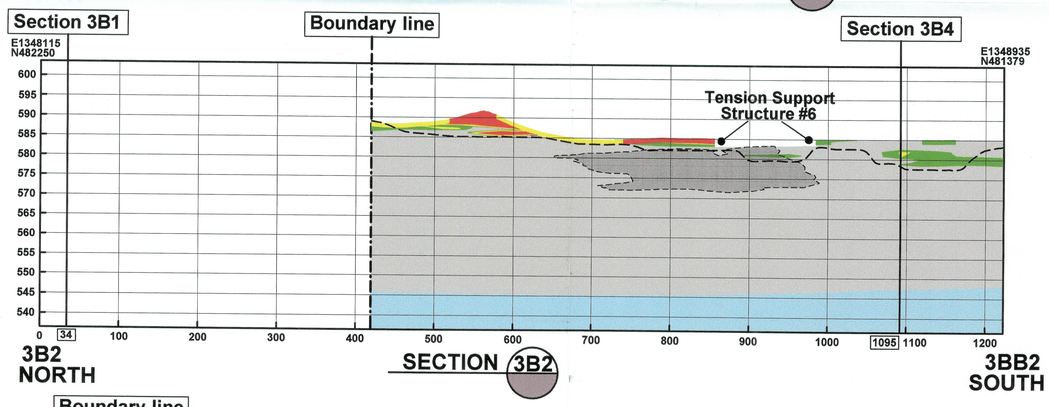
- SILT AND SAND LENSES
- CLAY
- GMA
- EXCAVATION PROFILE

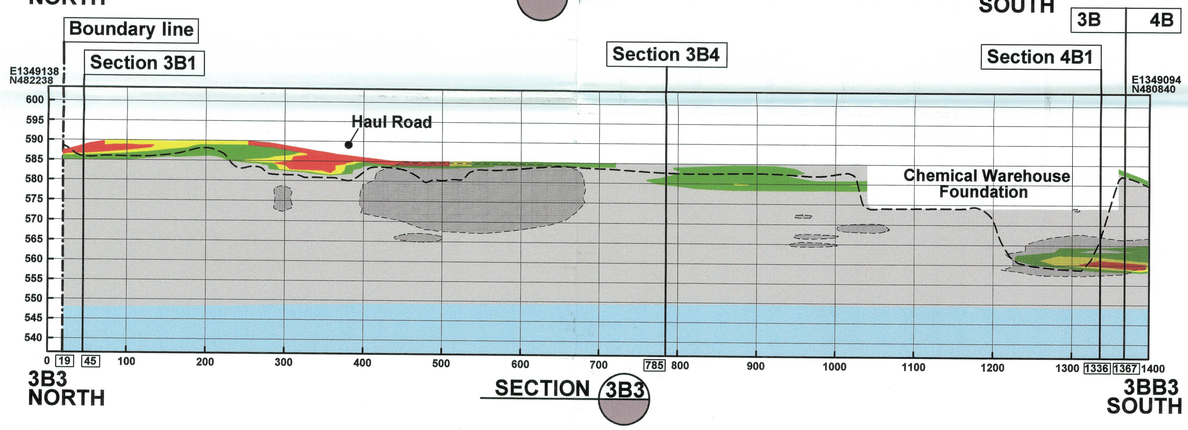
AREA 4A CROSS SECTIONS

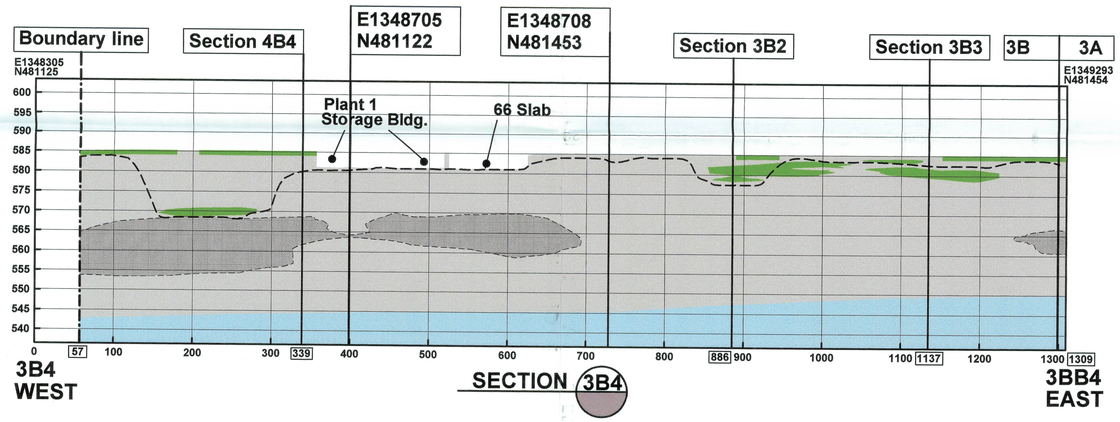
FIGURE A-2

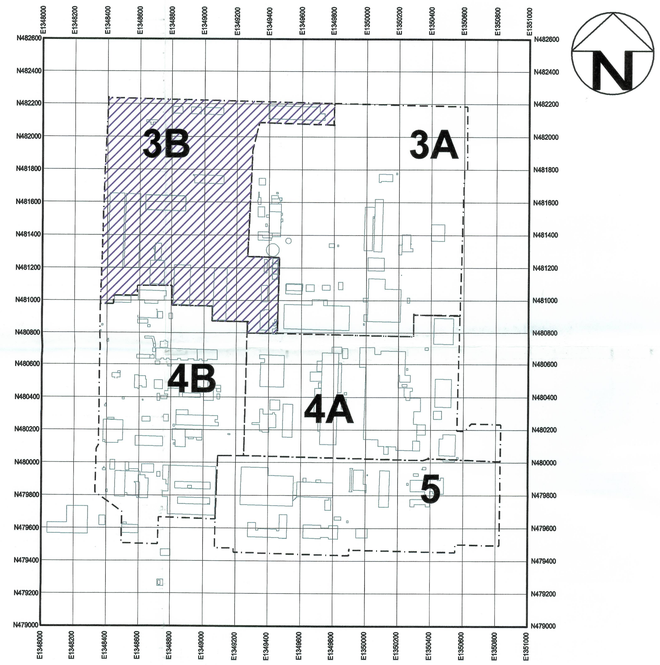
MAY 24, 1999 FINAL ISSUE REV. 0



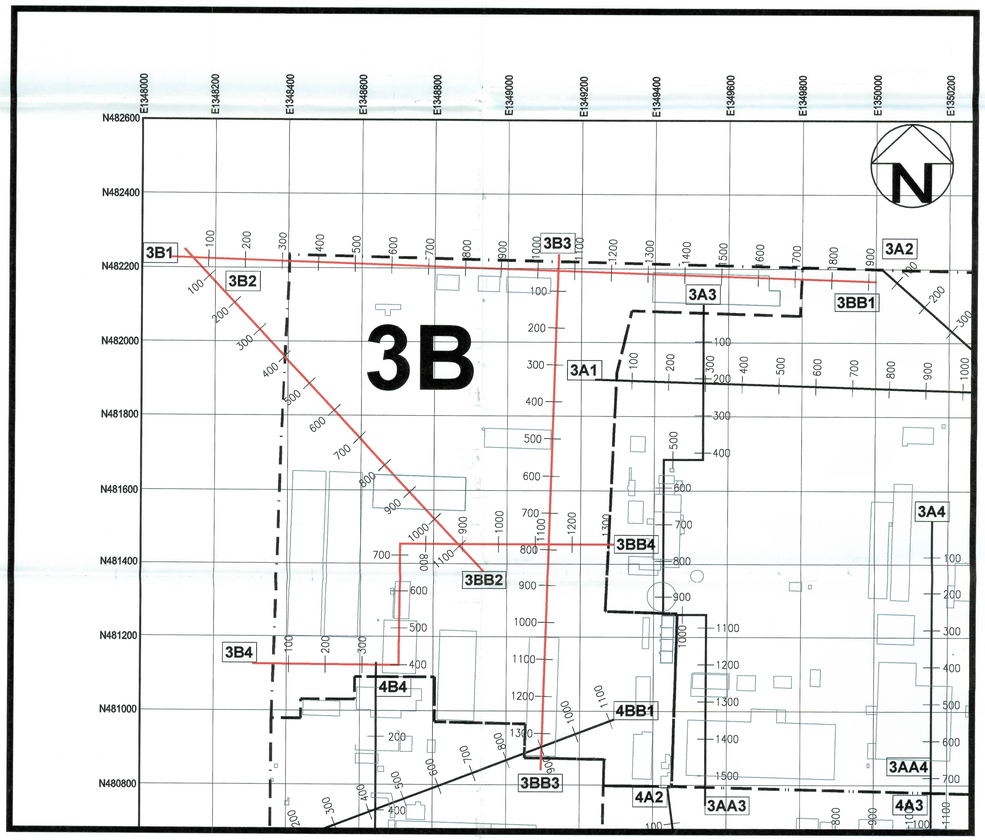








AREA 3B KEY PLAN



AREA 3B

COLOR LEGEND
TOTAL URANIUM CONCENTRATION

- ≥ 1030 mg/kg
- ≥ 82 mg/kg
- ≥ 50 mg/kg
- ≥ 20 mg/kg

- SILT AND SAND LENSES
- CLAY
- GMA
- EXCAVATION PROFILE

AREA 3B CROSS SECTIONS

000100

FIGURE A-3

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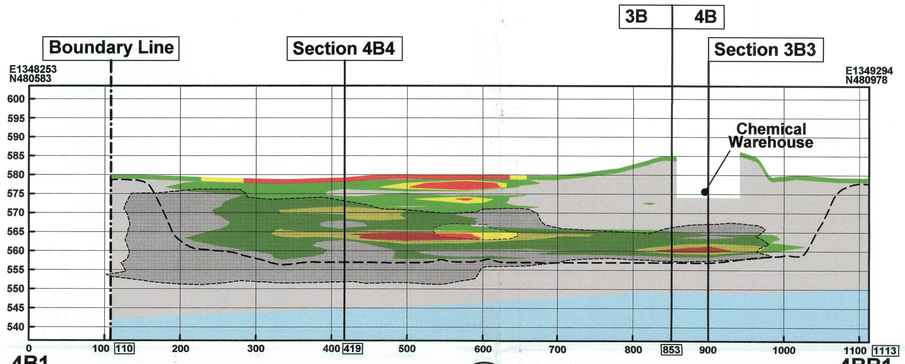

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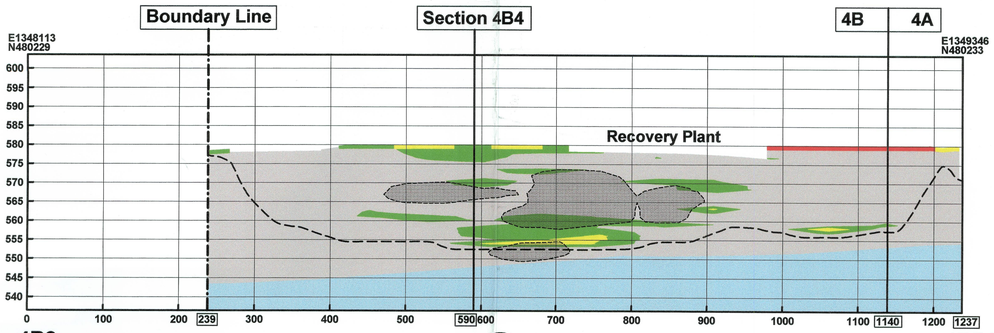

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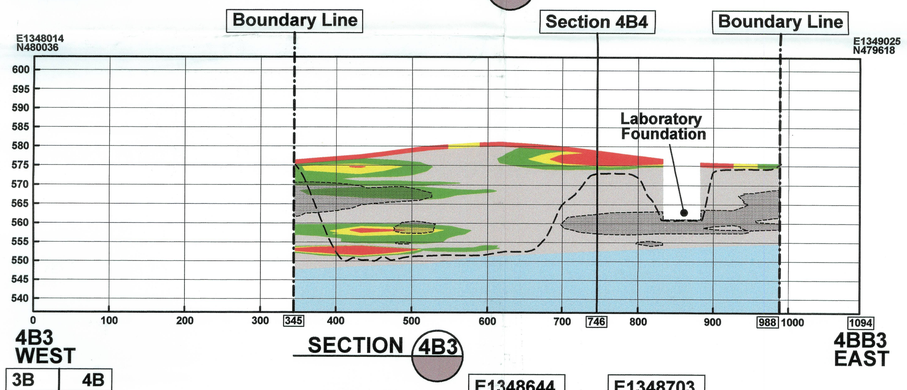

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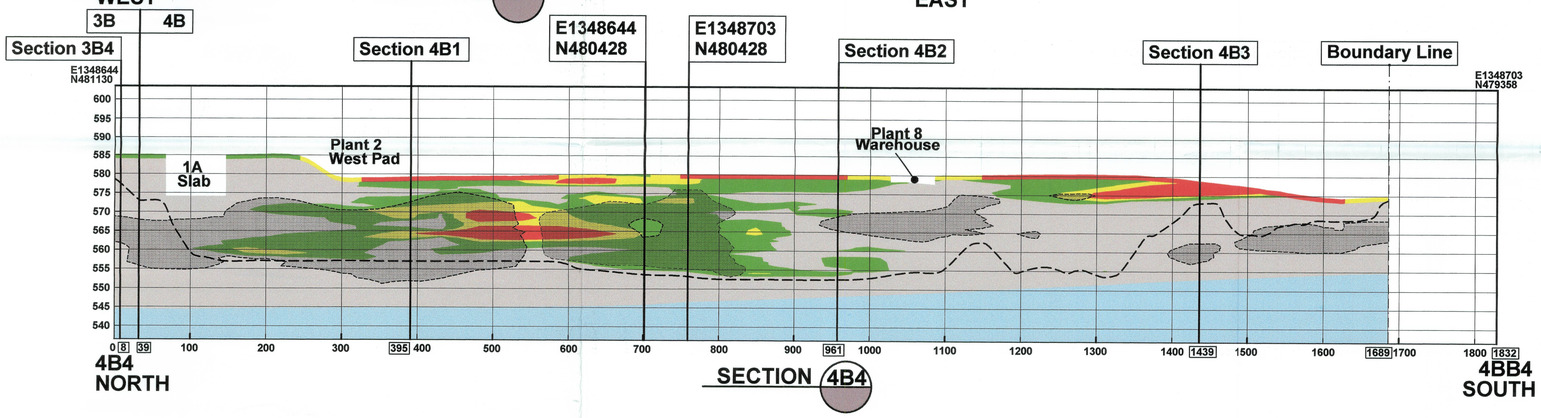

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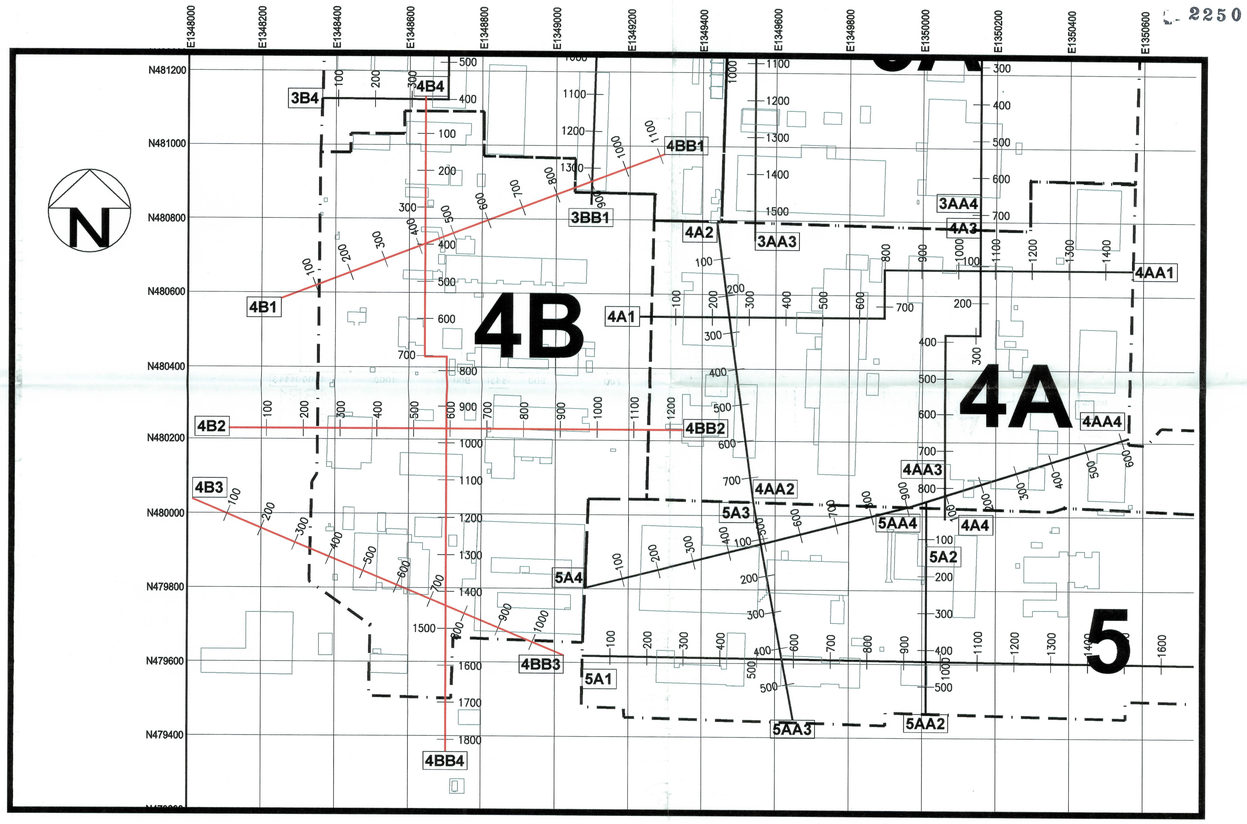
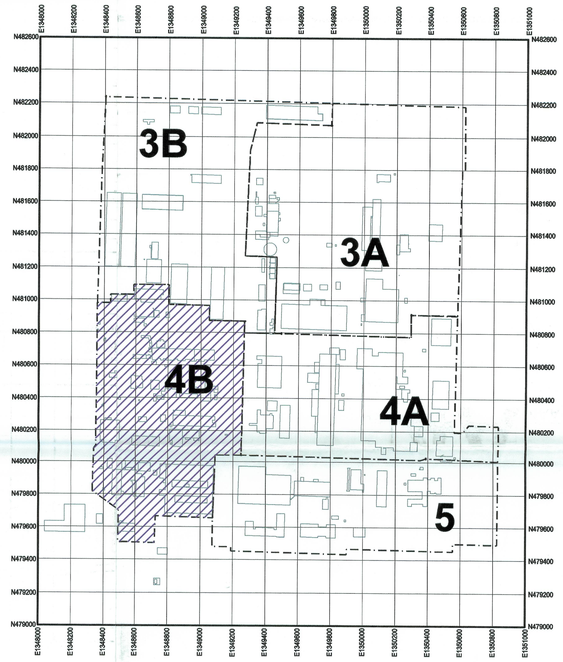


AREA 4B



AREA 4B KEY PLAN

COLOR LEGEND

TOTAL URANIUM CONCENTRATION

- ≥ 1030 mg/kg
- ≥ 82 mg/kg
- ≥ 50 mg/kg
- ≥ 20 mg/kg

- SILT AND SAND LENSES
- CLAY
- GMA
- EXCAVATION PROFILE

AREA 4B CROSS SECTIONS

000101

FIGURE A-4

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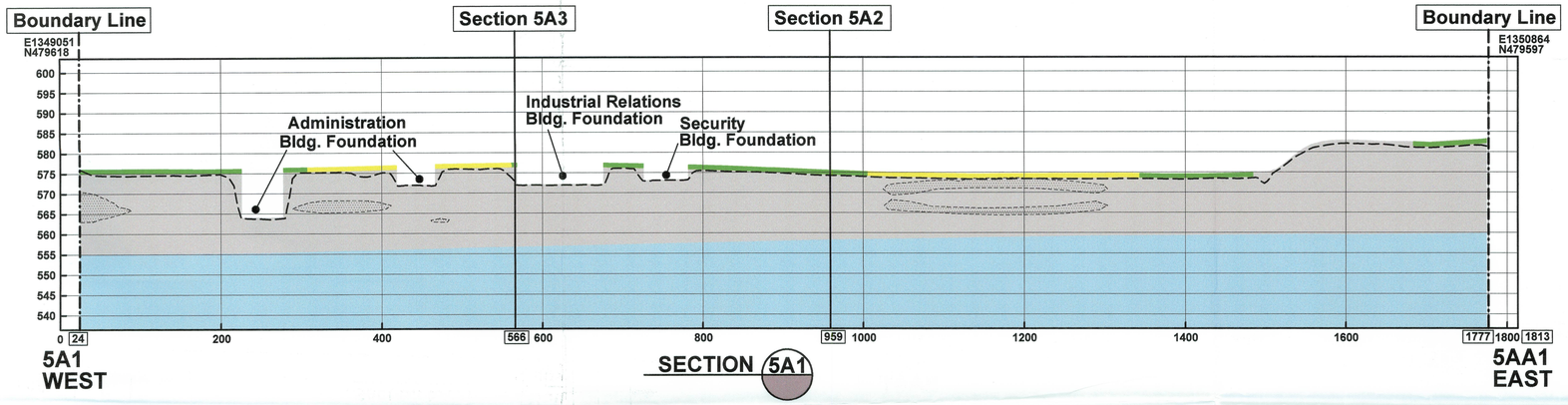
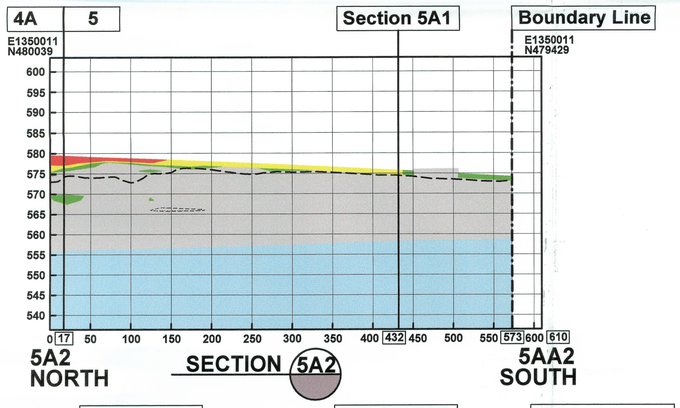
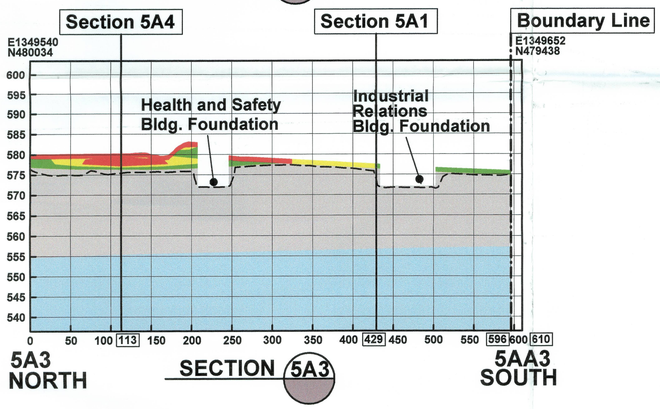
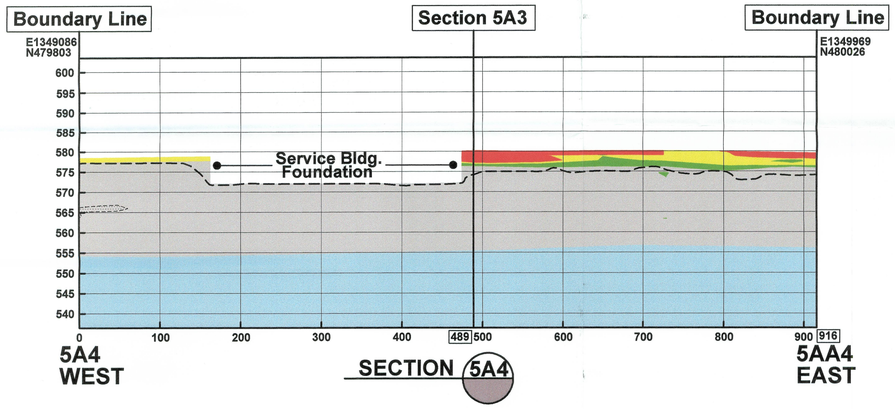
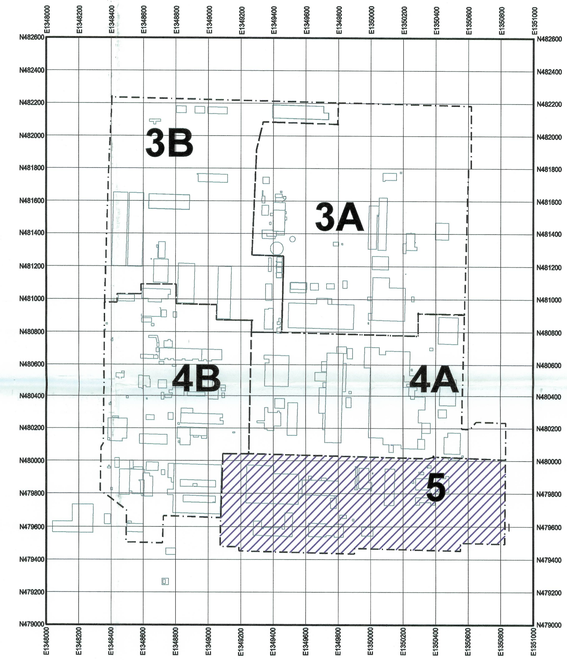


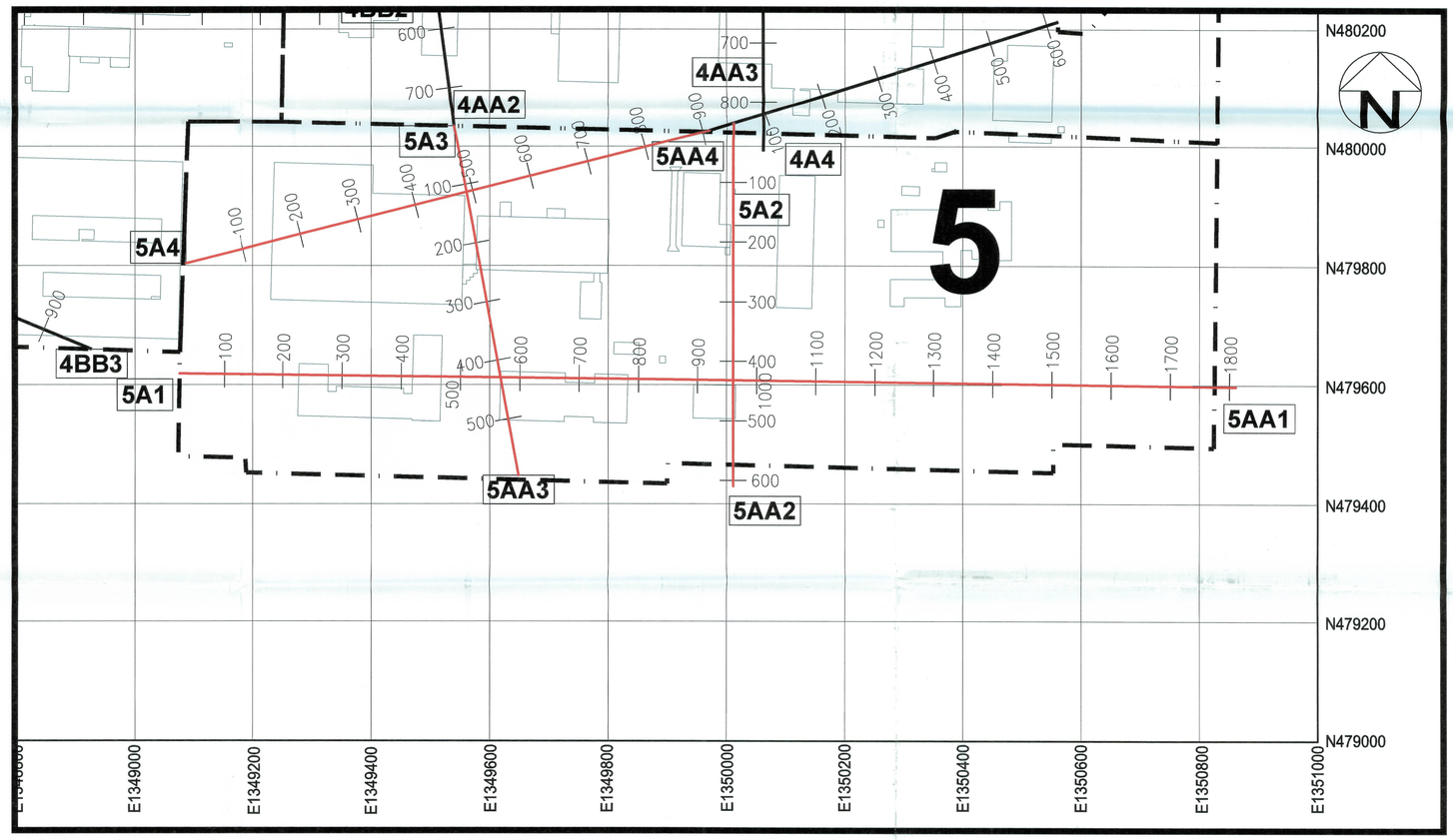








AREA 5 KEY PLAN



AREA 5

COLOR LEGEND

TOTAL URANIUM CONCENTRATION

- ≥ 1030 mg/kg
- ≥ 82 mg/kg
- ≥ 50 mg/kg
- ≥ 20 mg/kg

- SILT AND SAND LENSES
- CLAY
- GMA
- EXCAVATION PROFILE

AREA 5 CROSS SECTIONS

000102

FIGURE A-5

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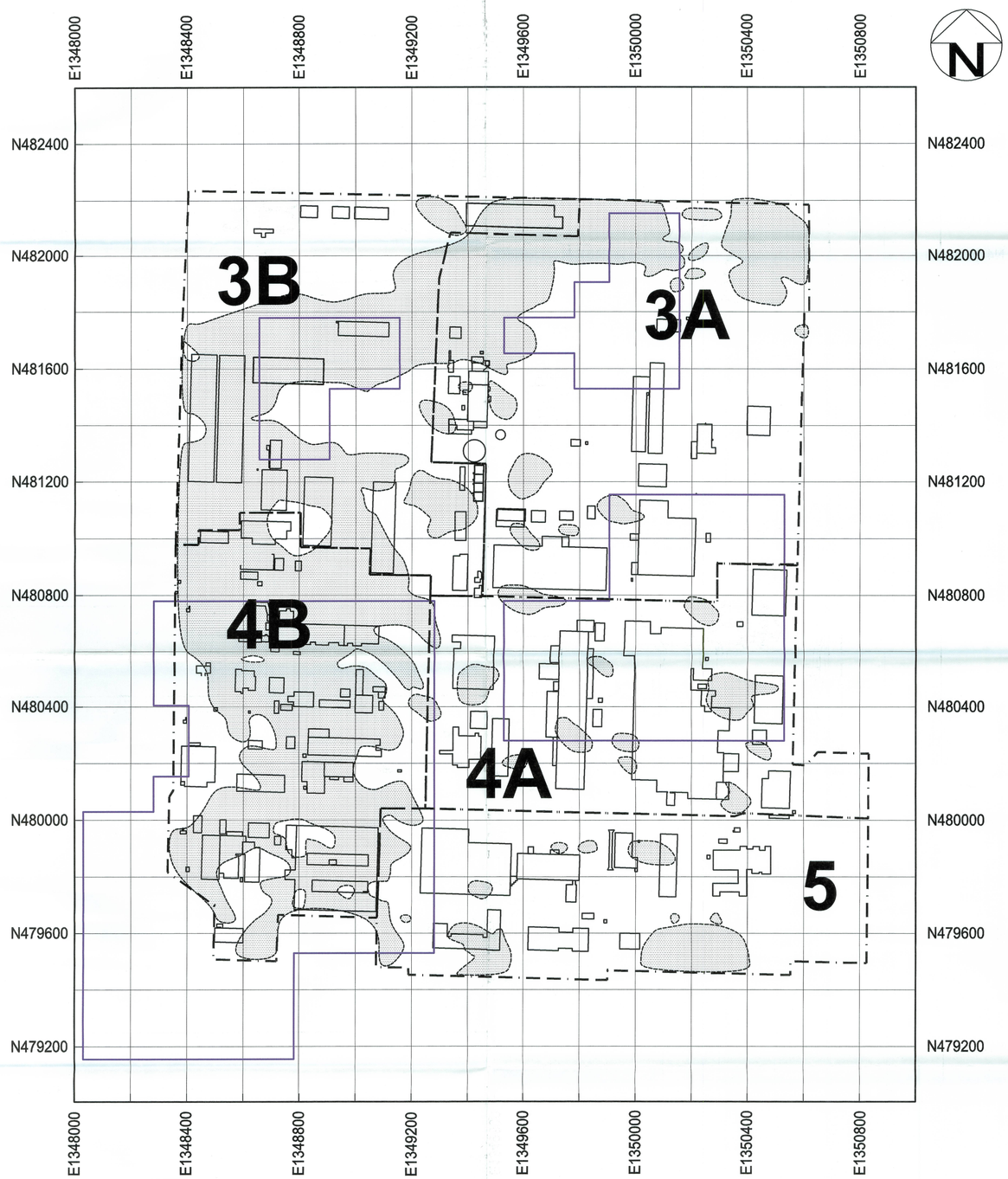
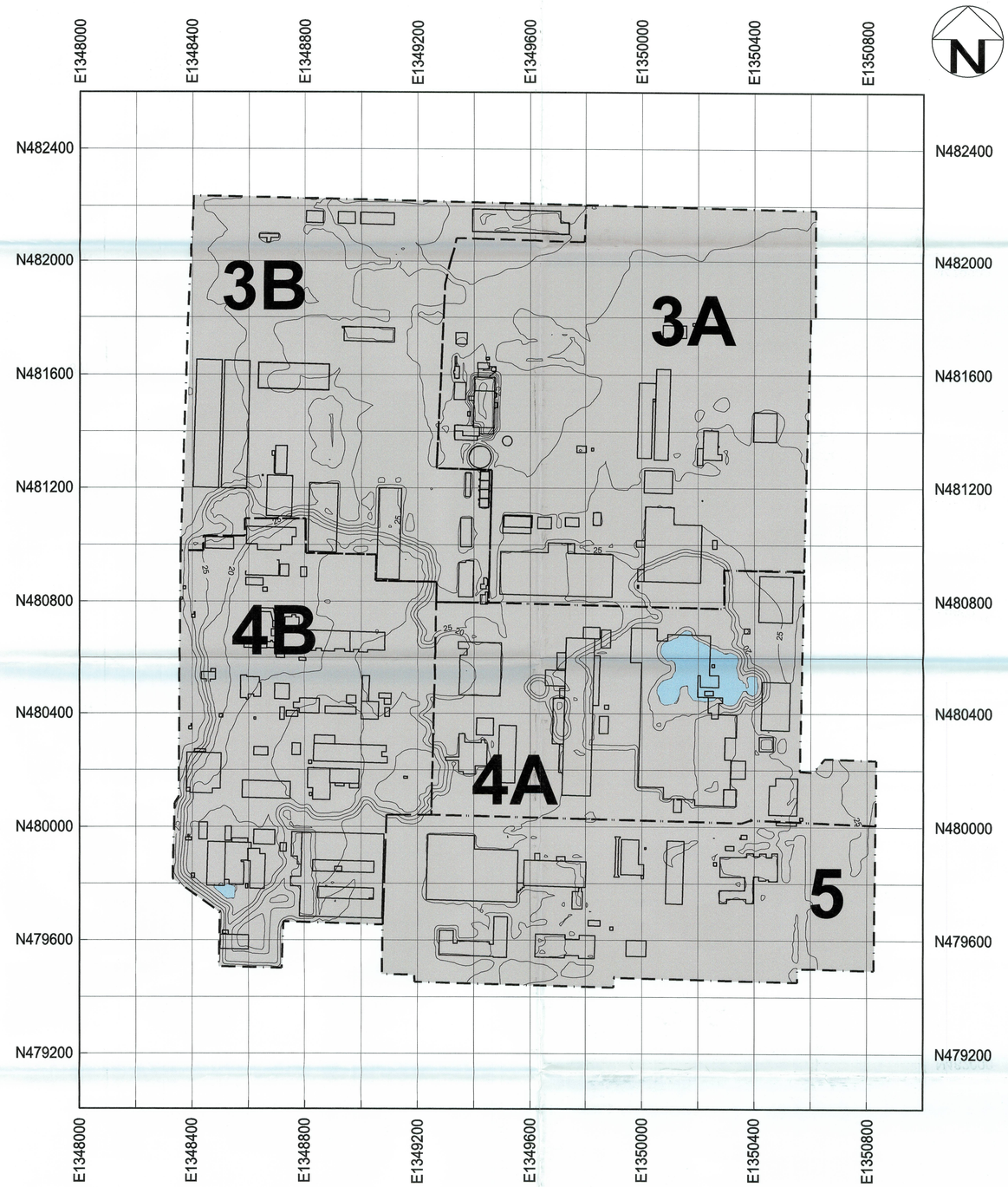


AREAS OF HIGH LEACHABILITY AND AREAS OF SILT AND SAND LENSES



AREAS WHERE GLACIAL TILL HAS BEEN BREACHED TO EXPOSE THE GREAT MIAMI AQUIFER

SILT AND SAND LENSES
TILL
GMA
EXCAVATION PROFILE
HIGH LEACHABILITY BOUNDARY

SILT AND SAND LENSES AND BREACHED AREAS

000103

FIGURE A-6

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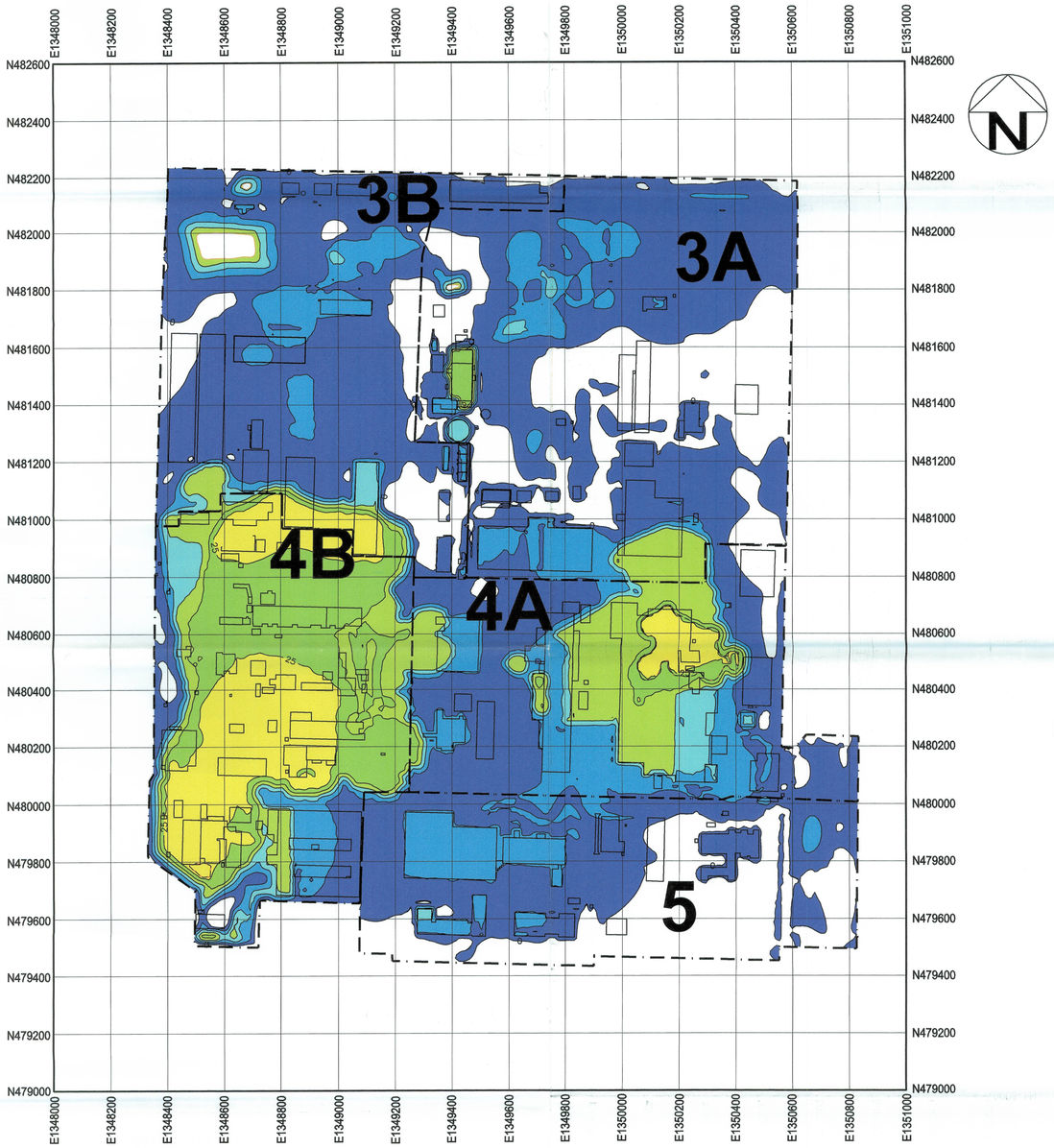
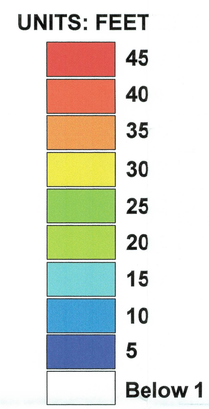
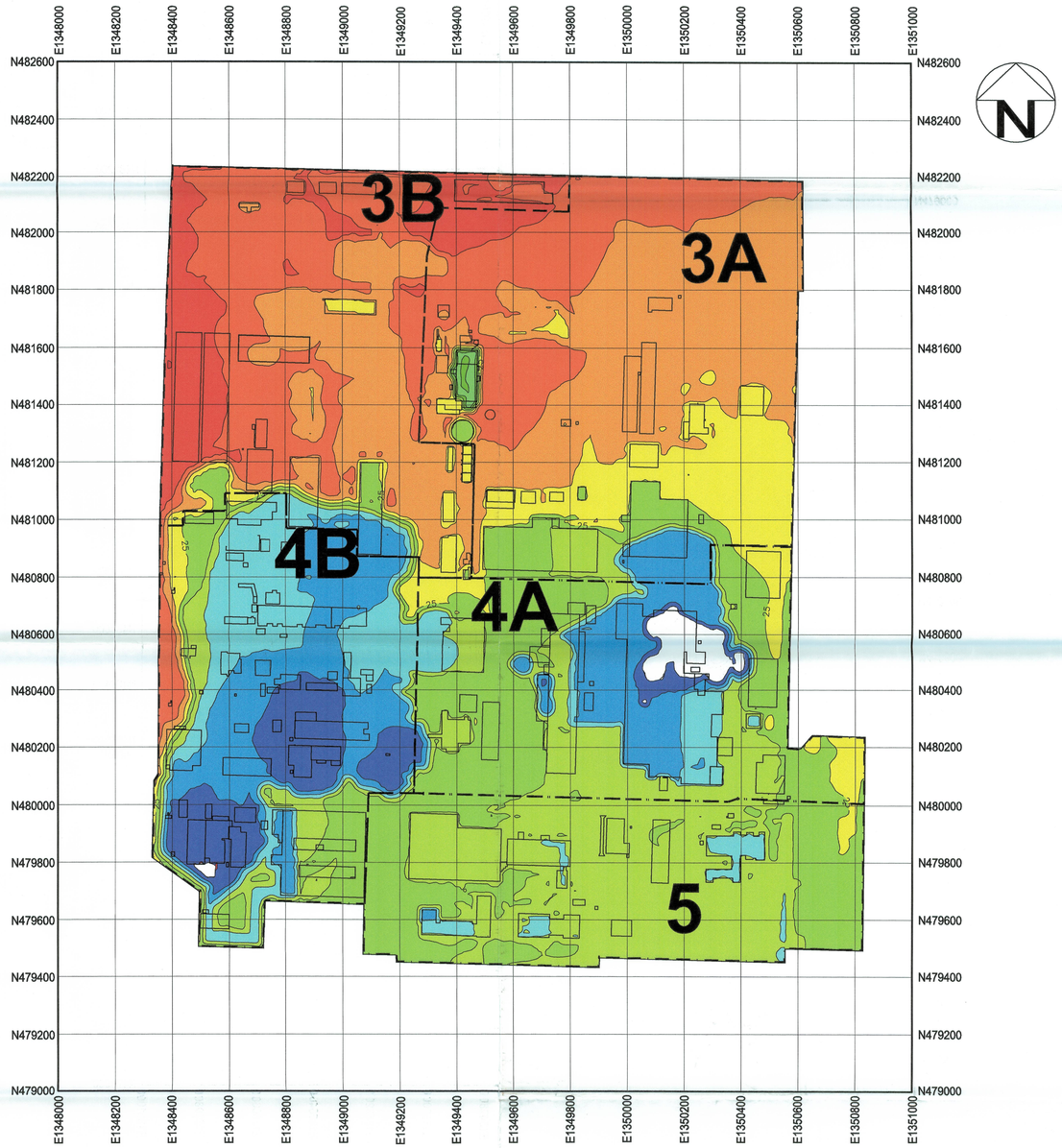


ISOPACH MAP OF EXCAVATED SOIL





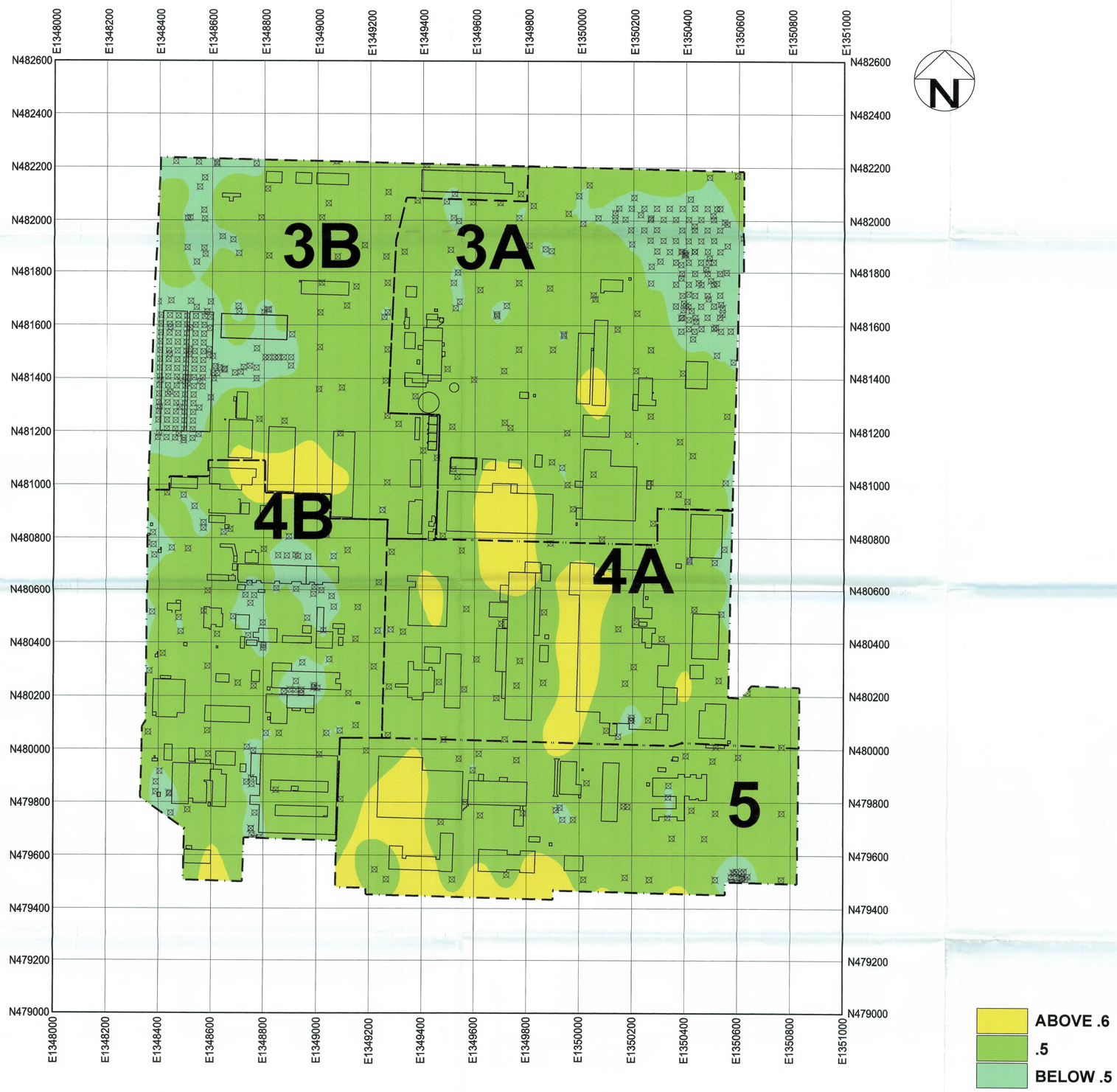
ISOPACH MAP OF TILL THICKNESS AFTER EXCAVATION

ISOPACH MAPS

000104

FIGURE A-7

MAY 24, 1999 FINAL ISSUE REV. 0



SURFACE MODEL KRIGING VARIANCE WITH SURFACE DATA POINTS

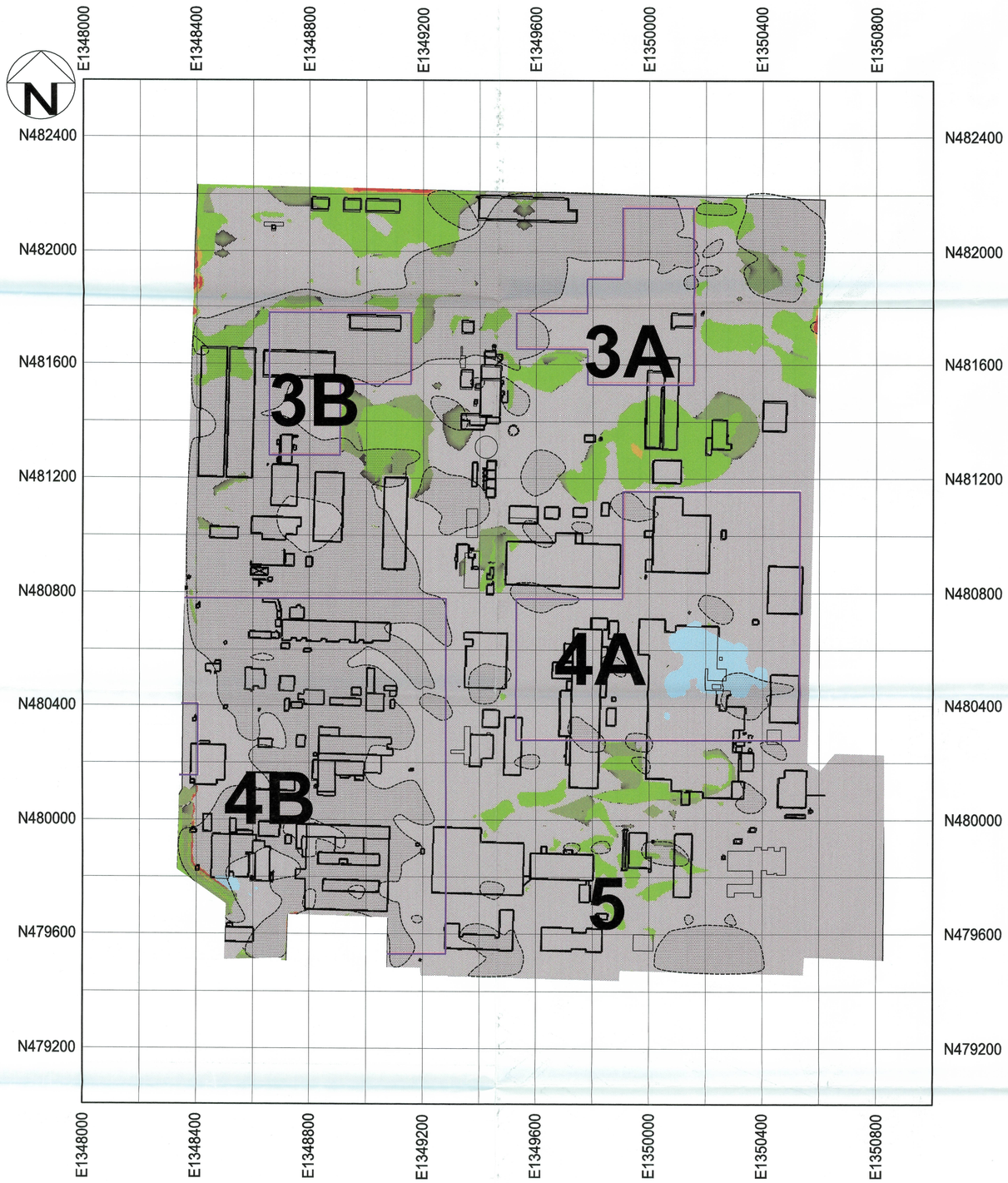
⊠ Surface Uranium Data Point

KRIGING VARIANCE

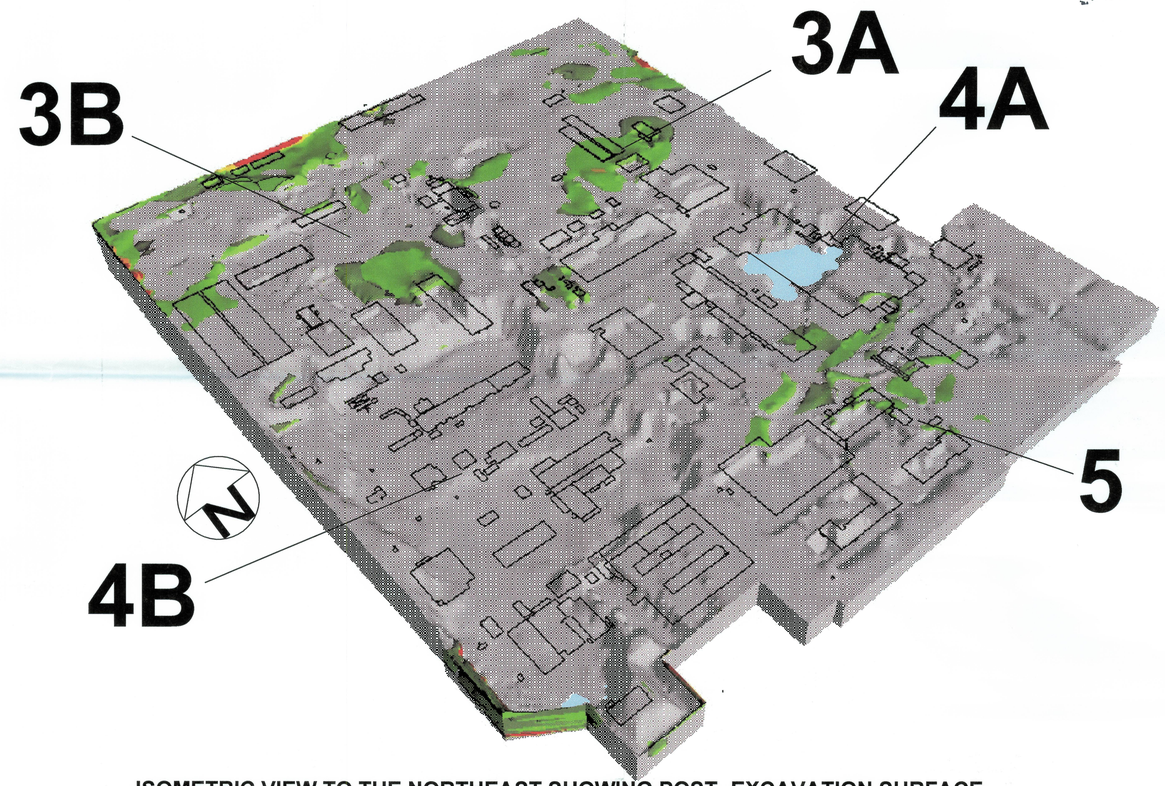
000105

FIGURE A-8

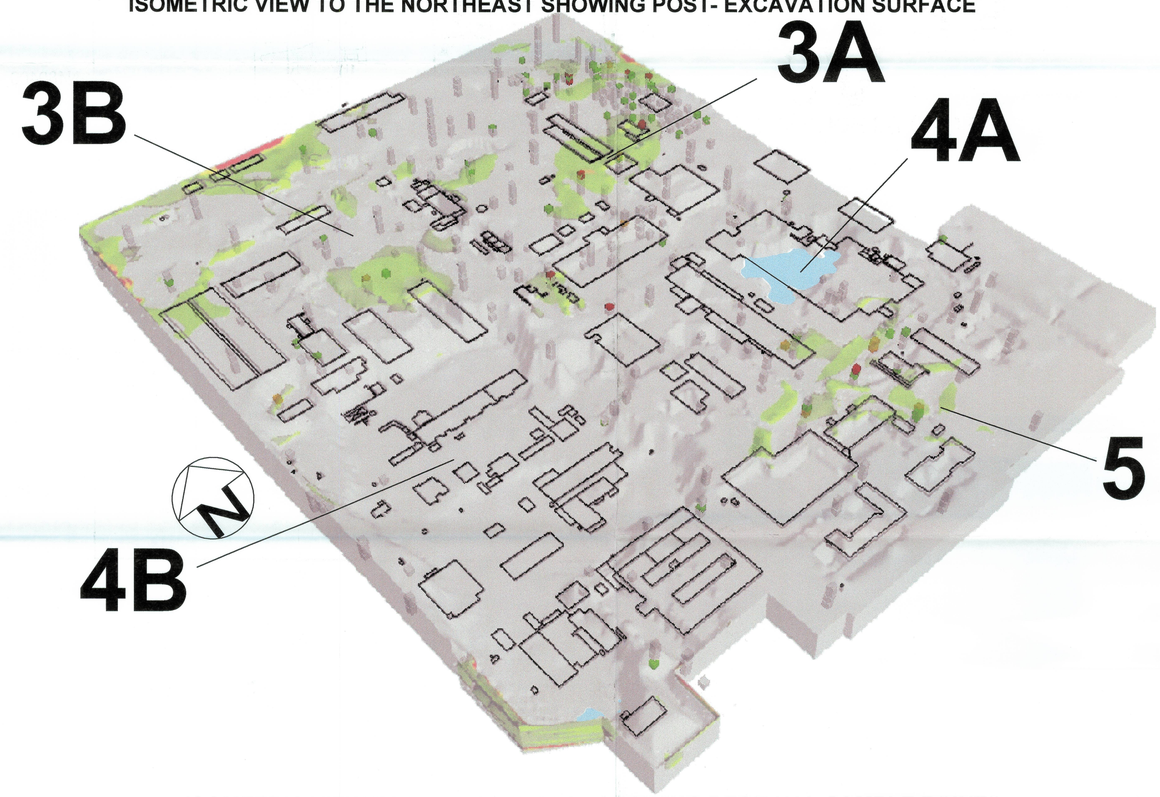
MAY 24, 1999 FINAL ISSUE REV. 0



PLAN VIEW OF EXCAVATION WITH RESIDUAL CONTAMINATION AND SILT AND SAND ZONES



ISOMETRIC VIEW TO THE NORTHEAST SHOWING POST- EXCAVATION SURFACE



ISOMETRIC VIEW TO THE NORTHEAST SHOWING RESIDUAL SAMPLE POINTS

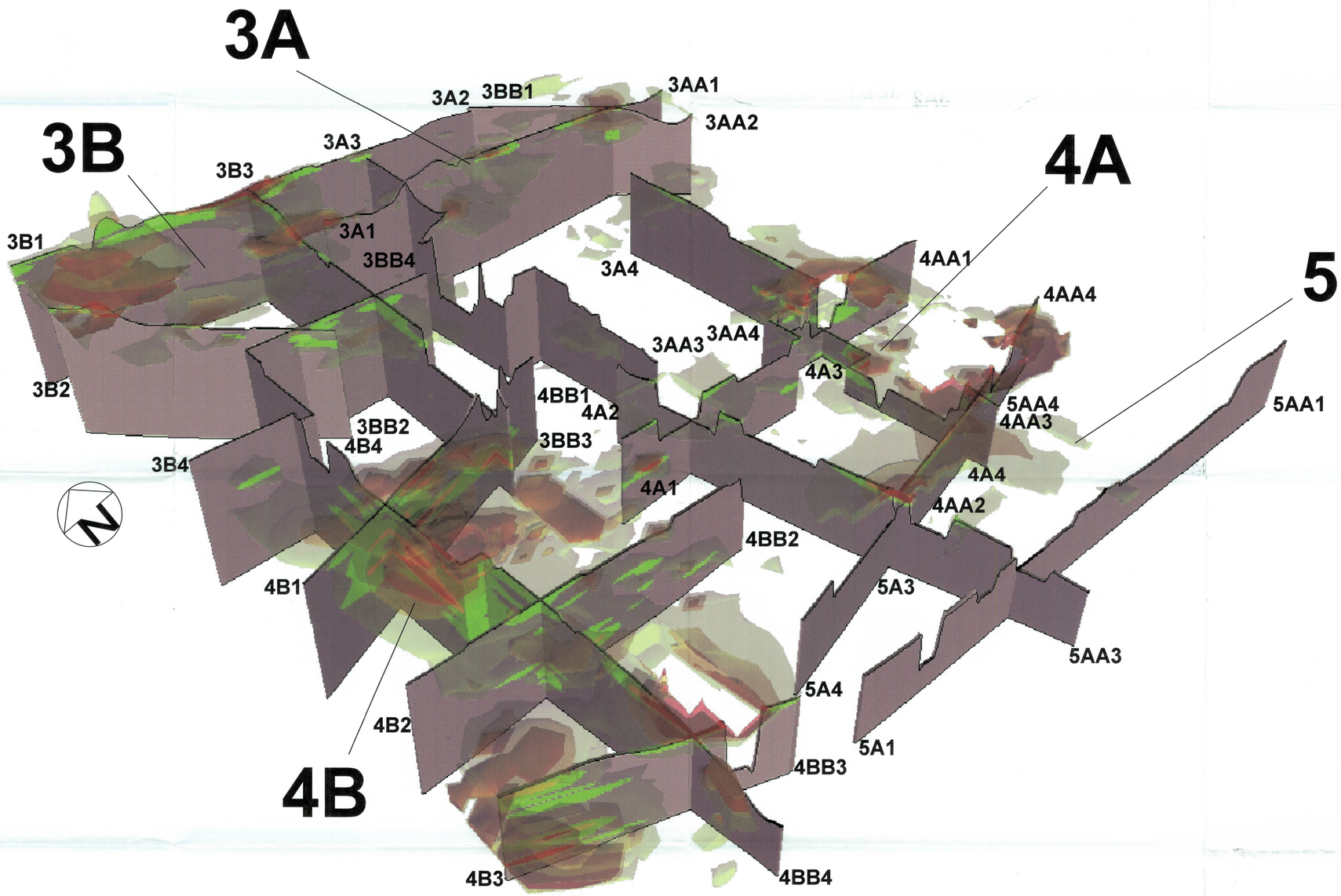
COLOR LEGEND
TOTAL URANIUM CONCENTRATION
- ≥ 1030 mg/kg
- ≥ 82 mg/kg
- ≥ 50 mg/kg
- ≥ 20 mg/kg

- SILT AND SAND LENSES
- CLAY
- GMA
- HIGH LEACHABILITY BOUNDARY

POST- EXCAVATION SURFACES

FIGURE A-9

MAY 24, 1999 FINAL ISSUE REV. 0



ISOMETRIC VIEW OF FENCE DIAGRAM LOOKING TO THE NORTHEAST

COLOR LEGEND
TOTAL URANIUM CONCENTRATION

- ≥ 1030 mg/kg
- ≥ 82 mg/kg
- ≥ 50 mg/kg
- ≥ 20 mg/kg

TILL

FENCE DIAGRAM

000107

FIGURE A-10

MAY 24, 1999 FINAL ISSUE REV. 0

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APPENDIX B

3-D Model Reference Material

3-D Model Reference Material

The input data files *surface.prn, subucgm.prn*, and *subnocgm.prn* (received from FDF on 17 December 1998, 24 December 1998, and 24 December 1998), contain total uranium concentration data from surface soil samples, subsurface soil samples in areas of silt/sand, and subsurface soil samples in areas of clay material, respectively. Revised input data files *surfaceu99.dat*, *subucgm99.pdat*, and *subnocgm99.pdat*, were developed on 24 December 1999, 7 January 1999, 7 January 1999, respectively. Plan views of the revised input data sets are shown in Figures B-1, B-2, B-3 for the surface uranium, subsurface uranium silt/sand, and subsurface uranium clay sets, respectively. The EarthVision formula processor was used to log transform the data files for the Kriging process. The formula processor was also used to z-scale the elevation of each contamination point by 40 to do variogram modeling. Variograms were calculated, plotted, and modeled for each data set using EarthVision's geostatistics package. The EarthVision variogram modeler provides a best fit model curve to the variogram points, and these curves are used to set the Kriging search ranges and to develop the weighting coefficients applied in the Kriging process. A sample variogram plot showing the modeled variogram curve is shown in Figure B-4. The variogram points were fit with a 2 component model consisting of a nugget and an exponential function. The nugget estimates local variability around individual data points, and the exponential function estimates the range beyond where data are no longer spatially correlated.

Figure B-1
Surface Uranium Data Set (surfaceu99.dat)

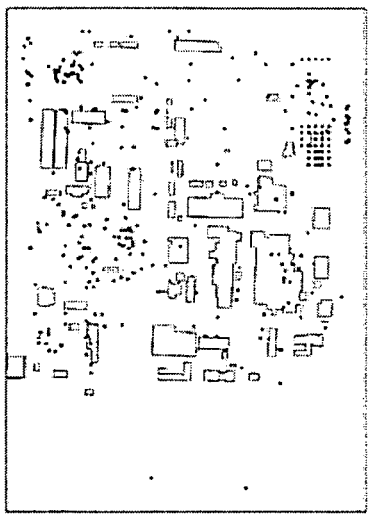

Figure B-2
Subsurface Uranium Silt/Sand Data Set (subucgm99.pdat)

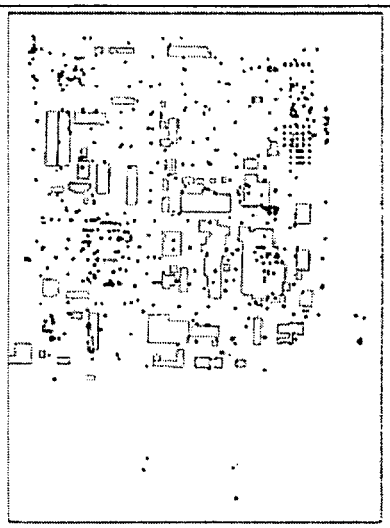

Figure B-3
Subsurface Uranium Clay Data Set (subnocgm99.pdat)

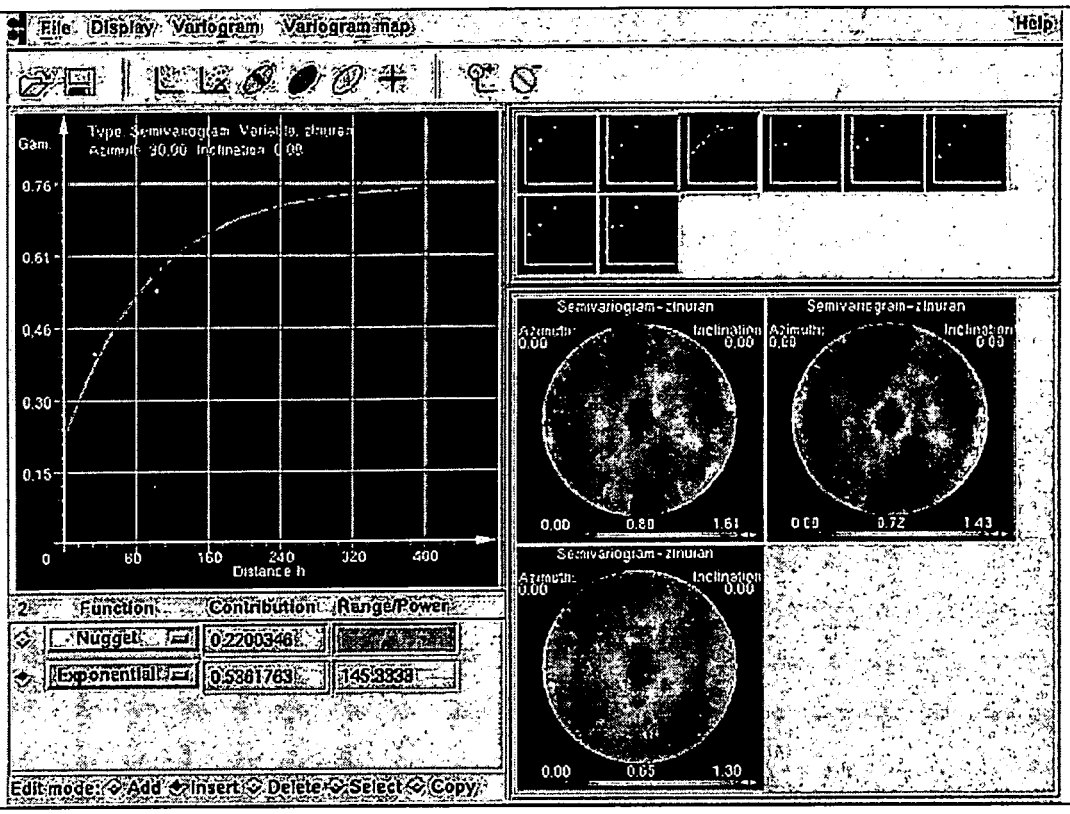

Figure B-4
Sample Variogram Plot

No significant differences were noted between the fitting parameters for the subsurface silt/sand variograms and the subsurface clay variograms. Therefore, the same variogram modeling parameters were used for Kriging both subsurface data sets. Furthermore, no significant horizontal anisotropies were noted in either of the three data sets. From the variogram modeling process, the Kriging ranges were selected and assigned as noted in Tables B-1 and B-2.

	Horizontal Search Radius (ft).	Vertical Search Radius (ft)
Surface data	1,456	N/A
Subsurface data	250	7.5

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Table B-1
Kriging Parameters for the Surface Data

Surfaceu99.dat Field = zln			
Ranges of grid	**Easting**	**Northing**	**Elevation**
Minimum	1,348,224	478,448	N/A
Maximum	1,351,024	482,348	N/A
Grid Spacing	20	20	N/A
Grid Size	141	196	N/A
Search			
Azimuth = 180	Major = 3,000	Minor H = 2,000	
Inclination = 0	Rotation = 0	Minor V = N/A	Nugget = .384
Type = Exponential			
Azimuth = 90	Azimuth = 90		Range (major) = 924.85
	Contribution: .488		Range (minor H) = 1,456
			Range (minor V) = N/A

Table B-2
Kriging Parameters for the Subsurface Data

Subnocgm99orgX40.pdat Field = ln			
Ranges of grid	**Easting**	**Northing**	**Elevation x 40**
Minimum	1,347,500	479,000	21,935.46
Maximum	1,351,000	482,600	24,235.34
Grid Spacing	50.72	52.17	34.8
Grid Size	70	70	67
Search			
Azimuth = 90	Major = 250	Minor H = 250	
Inclination = 0	Rotation = 90	Minor V = 300	Nugget = .0068
Type = Exponential			
Azimuth = 90	Azimuth = 90		Range (major) = 411
	Contribution: 1.06645		Range (minor H) = 411
			Range (minor V) = 197

The surface model grid was 141 blocks in the easting direction and 106 blocks in the northing direction with grid block dimensions of 20 ft by 20 ft. The subsurface models were 70 blocks in the easting direction by 70 blocks in the northing direction with 67 layers vertically. The subsurface model grid block dimensions were 51 ft by 52 ft by 0.9 ft in the easting, northing, and vertical directions, respectively. The models were constructed using a right-handed coordinate system. The origin of the surface model is located at the lower left corner of the block. The origin of the subsurface model is located at z elevation 536.5 ft and at the lower left corner of the block.

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The output files from the Kriging process were *surfaceu.2grd*, *subnocgm99.3grd*, and *subucgm99.3grd* for the three input files, respectively. The output files were created on 8 January 1999, 15 January 1999, and 15 January, 1999, respectively. The two Kriged subsurface output files were combined using the geologic model provided by FDF into a final output subsurface model in the *finalsubmodelfeb99.3grd* file. It was created on 19 January 1999.

After the complete subsurface model was constructed, the surface model was draped over the topography using the topographic map contained in the file fernaldtopo.dgn provided by FDF. The combined subsurface model was cut with the draped surface model with total uranium concentration data from the surface model replacing values in the subsurface model where the elevations were the same.

2250

APPENDIX C

Cost Estimate Reference Material

ESTIMATE SUMMARY SHEET

PROJECT: ACD - Former Plant Area
ESTIMATE NO.: 300-007340.01
CLIENT: FDF
WBS NO.: 1.0

DATE: 24-May-99
ESTIMATOR: J. Smith
LOCATION: OU 3
TASK NO.:

	ITEM DESCRIPTION	M/H	RATE	LABOR $	S/C $	MAT'L $	EQUIP. $	TOTAL $
1.3.1	Area 3A	97,042	$26.10	$2,533,000		$6,400,000		$8,933,000
1.3.2	Area 3B	74,512	$24.94	$1,858,000		$2,869,000		$4,727,000
1.3.3	Area 4A	104,919	$25.39	$2,664,000		$3,675,000		$6,339,000
1.3.4	Area 4B	182,330	$25.20	$4,594,000		$6,408,000		$11,002,000
1.3.5	Area 5	60,021	31.26	$1,876,000		$1,778,000		$3,654,000
1.3.6	Post-Construction Activities	18,113	$22.08	$400,000		$242,000		$642,000
	DIRECT FIELD COSTS TOTAL	**536,937**	**$25.93**	**$13,925,000**	**$0**	**$21,372,000**	**$0**	**$35,297,000**
	SUPERVISION - CONTRACTOR 17%	91,281		$2,367,300				$2,367,300
	SMALL TOOLS & CONSUMABLES 6%					$835,500		$835,500
	MISC. EQUIP. RENTAL 3.50						$1,879,300	$1,879,300
	TEMPORARY FACILITIES 6%	16,108		$417,800		$417,800		$835,600
	TEMPORARY UTILITY HOOK-UP 3%	10,470		$271,500		$146,200		$417,700
	JOB CLEAN-UP 6%	24,162		$626,600		$208,900		$835,500
	SAFETY (included w/ site & ppe prod. Factors)							
	HEALTH PHYSICS S/C	0		$0				$0
	CERCLA - 40 HRs/FTE	200		$5,200				$5,200
	GET/SITE ACCESS & JOB SPECIFIC TRAINING	144		$3,700				$3,700
	PAYROLL BURDENS & BENEFITS 57%	-	-	$10,041,700				$10,041,700
	OVERHEAD & PROFIT 20%	-	-		$10,503,700			$10,503,700
	BOND 1%	-	-		$630,200			$630,200
	SALES TAX 6%	-	-			$1,378,800	$112,800	$1,491,600
	INDIRECT FIELD COSTS TOTAL	**142,366**		**$13,733,800**	**$11,133,900**	**$2,987,200**	**$1,992,100**	**$29,847,000**
	DIRECT & INDIRECT FIELD COSTS TOTAL	**679,303**	**$40.72**	**$27,658,800**	**$11,133,900**	**$24,359,200**	**$1,992,100**	**$65,144,000**
	WASTE DISPOSITION MGMT. - FD FERNALD			$0	$0	$0	$0	$0
	OFF-SITE DISPOSAL COSTS (Commercial)			$0	$0	$0	$0	$0
	WASTE MANAGEMENT COSTS TOTAL			**$0**	**$0**	**$0**	**$0**	**$0**
	PROJECT MANAGEMENT - FD FERNALD 30%			$19,543,200	$0	$0	$0	$19,543,200
	CONSTRUCTION MANAGEMENT FD FERNALD 30%			$19,543,200	$0	$0	$0	$19,543,200
	FD FERNALD FIELD SUPPORT COSTS TOTAL			**$39,086,400**	**$0**	**$0**	**$0**	**$39,086,400**
	ENGINEERING/DESIGN/INSPECTION - FD FERNALD 6%			$3,908,600		$0		$3,908,600
	ENGINEERING/DESIGN/INSPECTION - A/E 6%				$3,908,600			$3,908,600
	ENGINEERING COSTS TOTAL			**$3,908,600**	**$3,908,600**	**$0**	**$0**	**$7,817,200**
	SALES TAX - FD FERNALD 6%					$0		$0
	SUB-TOTAL (BASE ESTIMATE)							**$112,047,600**
	RISK BUDGET							$0
	TARGET ESTIMATE							**$112,047,600**
	CONTINGENCY							$0

ACD - FORMER PLANT AREA

SUMMARY REPORT
$1 = $1000

05/17/1999

Arranged By: WBS

	Unescalated			Escalated		
	Material $	Labor $	Total $	Material $	Labor $	Total $
1.3.1 AREA 3A	6400	2533	8933	6400	2533	8933
1.3.2 AREA 3B	2869	1858	4727	2869	1858	4727
1.3.3 AREA 4A	3675	2664	6339	3675	2664	6339
1.3.4 AREA 4B	6408	4594	11002	6408	4594	11002
1.3.5 AREA 5	1778	1876	3654	1778	1876	3654
1.3.6 POST-CONST ACTIVITIES	242	400	642	242	400	642
SUB - TOTAL	21372	13925	35297	21372	13925	35297
CONTINGENCY	0	0	0	0	0	0
GRAND TOTAL	21372	13925	35297	21372	13925	35297

000115

ACD - FORMER PLANT AREA

2250

SUMMARY REPORT
$1 = $1000

05/17/1999

Arranged By: WBS / B/M Attribute

	Unescalated			Escalated		
	Material $	Labor $	Total $	Material $	Labor $	Total $
1.3.1.1 FDN & UTIL. REMOVALS						
C1.01 CONCRETE FOUNDATIONS	865	454	1319	865	454	1319
C1.06 ASPHALT REMOVAL	10	5	15	10	5	15
TOTAL FDN & UTIL. REMOVALS	875	459	1334	875	459	1334
1.3.1.2 SOIL EXCAVATION						
C2.01 SOIL EXCAV ABV-WAC	11	7	18	11	7	18
C2.05 TCE SOIL	28	36	64	28	36	64
C2.06 RCRA SOIL TREATMENT	3007	0	3007	3007	0	3007
C2.09 SOIL EXCAVATION	875	446	1321	875	446	1321
C2.14 BACKFILL	14	7	21	14	7	21
TOTAL SOIL EXCAVATION	3935	496	4431	3935	496	4431
1.3.1.3 GROUNDWATER CNTRL						
C3.01 GROUNDWATER CONTROL	149	119	268	149	119	268
TOTAL GROUNDWATER CNTRL	149	119	268	149	119	268
1.3.1.4 SITE PREPARATION						
C4.01 SITE PREP,ROADS,FENCING	568	211	779	568	211	779
TOTAL SITE PREPARATION	568	211	779	568	211	779
1.3.1.5 GENERAL REQUIREMENTS						
C5.01 GENERAL REQUIREMENTS	137	1146	1283	137	1146	1283
C5.02 MOBILIZATION	216	11	227	216	11	227
C5.03 DEMOBILIZATION	235	56	291	235	56	291
TOTAL GENERAL REQUIREMENTS	588	1213	1801	588	1213	1801
1.3.1.6 URGRADE RIMIA FACILITY						
A6.01 DEMOLITION	1	2	3	1	2	3

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ACD - FORMER PLANT AREA

SUMMARY REPORT
$1 = $1000

05/17/1999

Arranged By: WBS / B/M Attribute

	Unescalated			Escalated		
	Material	Labor	Total	Material	Labor	Total
	$	$	$	$	$	$
1.3.1.6 URGRADE RIMIA FACILITY						
A6.02 ARCH CONSTRUCTION	32	22	54	32	22	54
A6.03 MECHANCIAL	48	5	53	48	5	53
A6.04 ELECTRICAL	2	3	5	2	3	5
A6.05 WHEEL WASH STATION	201	2	203	201	2	203
TOTAL URGRADE RIMIA FACILITY	284	34	318	284	34	318
1.3.2.1 FDN & UTIL. REMOVALS						
C1.02 CONCRETE FOUNDATIONS	1141	599	1740	1141	599	1740
C1.07 ASPHALT REMOVAL	11	5	16	11	5	16
TOTAL FDN & UTIL. REMOVALS	1152	604	1756	1152	604	1756
1.3.2.2 SOIL EXCAVATION						
C2.02 SOIL EXCAV ABV-WAC	56	48	104	56	48	104
C2.07 RCRA SOIL TREATMENT	27	0	27	27	0	27
C2.10 SOIL EXCAVATION	604	308	912	604	308	912
C2.15 BACKFILL	11	6	17	11	6	17
TOTAL SOIL EXCAVATION	698	362	1060	698	362	1060
1.3.2.3 GROUNDWATER CNTRL						
C3.02 GROUNDWATER CONTROL	93	63	156	93	63	156
TOTAL GROUNDWATER CNTRL	93	63	156	93	63	156
1.3.2.4 SITE PREPARATION						
C4.02 SITE PREP,ROADS,FENCING	389	126	515	389	126	515
TOTAL SITE PREPARATION	389	126	515	389	126	515
1.3.2.5 GENERAL REQUIREMENTS						
C5.04 GENERAL REQUIREMENTS	87	637	724	87	637	724
C5.05 MOBILIZATION	216	11	227	216	11	227

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ACD - FORMER PLANT AREA

SUMMARY REPORT
$1 = $1000

2250

05/17/1999

Arranged By: WBS / B/M Attribute

	Unescalated			Escalated		
	Material $	Labor $	Total $	Material $	Labor $	Total $
1.3.2.5 GENERAL REQUIREMENTS						
C5.06 DEMOBILIZATION	235	56	291	235	56	291
TOTAL GENERAL REQUIREMENTS	538	704	1242	538	704	1242
1.3.3.1 FDN & UTIL. REMOVALS						
C1.03 CONCRETE FOUNDATIONS	1696	890	2586	1696	890	2586
C1.08 ASPHALT REMOVAL	10	5	15	10	5	15
TOTAL FDN & UTIL. REMOVALS	1706	895	2601	1706	895	2601
1.3.3.2 SOIL EXCAVATION						
C2.03 SOIL EXCAV ABV-WAC	19	12	31	19	12	31
C2.11 SOIL EXCAVATION	681	347	1028	681	347	1028
C2.16 BACKFILL	136	56	192	136	56	192
TOTAL SOIL EXCAVATION	836	415	1251	836	415	1251
1.3.3.3 GROUNDWATER CNTRL						
C3.03 GROUNDWATER CONTROL	106	87	193	106	87	193
TOTAL GROUNDWATER CNTRL	106	87	193	106	87	193
1.3.3.4 SITE PREPARATION						
C4.03 SITE PREP,ROADS,FENCING	450	181	631	450	181	631
TOTAL SITE PREPARATION	450	181	631	450	181	631
1.3.3.5 GENERAL REQUIREMENTS						
C5.07 GENERAL REQUIREMENTS	125	1019	1144	125	1019	1144
C5.08 MOBILIZATION	216	11	227	216	11	227
C5.09 DEMOBILIZATION	235	56	291	235	56	291
TOTAL GENERAL REQUIREMENTS	576	1086	1662	576	1086	1662

ACD - FORMER PLANT AREA

SUMMARY REPORT
$1 = $1000

05/17/1999

Arranged By: WBS / B/M Attribute

	Unescalated			Escalated		
	Material	Labor	Total	Material	Labor	Total
	$	$	$	$	$	$
1.3.4.1 FDN & UTIL. REMOVALS						
C1.04 CONCRETE FOUNDATIONS	1111	583	1694	1111	583	1694
C1.09 ASPHALT REMOVAL	10	5	15	10	5	15
TOTAL FDN & UTIL. REMOVALS	1121	588	1709	1121	588	1709
1.3.4.2 SOIL EXCAVATION						
C2.04 SOIL EXCAV ABV-WAC	26	17	43	26	17	43
C2.08 RCRA SOIL TREATMENT	27	0	27	27	0	27
C2.12 SOIL EXCAVATION	3370	1716	5086	3370	1716	5086
C2.17 BACKFILL	125	52	177	125	52	177
TOTAL SOIL EXCAVATION	3548	1785	5333	3548	1785	5333
1.3.4.3 GROUNDWATER CNTRL						
C3.04 GROUNDWATER CONTROL	87	135	222	87	135	222
TOTAL GROUNDWATER CNTRL	87	135	222	87	135	222
1.3.4.4 SITE PREPARATION						
C4.04 SITE PREP,ROADS,FENCING	488	263	751	488	263	751
TOTAL SITE PREPARATION	488	263	751	488	263	751
1.3.4.5 GENERAL REQUIREMENTS						
C5.10 GENERAL REQUIREMENTS	187	1656	1843	187	1656	1843
C5.11 MOBILIZATION	465	29	494	465	29	494
C5.12 DEMOBILIZATION	511	138	649	511	138	649
TOTAL GENERAL REQUIREMENTS	1163	1823	2986	1163	1823	2986
1.3.5.1 FDN & UTIL. REMOVALS						
C1.05 CONCRETE FOUNDATIONS	686	360	1046	686	360	1046
C1.10 ASPHALT REMOVAL	12	6	18	12	6	18
TOTAL FDN & UTIL. REMOVALS	698	366	1064	698	366	1064

000119

ACD - FORMER PLANT AREA

2250

SUMMARY REPORT
$1 = $1000

05/17/1999

Arranged By: WBS / B/M Attribute

	Unescalated			Escalated		
	Material	Labor	Total	Material	Labor	Total
	$	$	$	$	$	$
1.3.5.2 SOIL EXCAVATION						
C2.13 SOIL EXCAVATION	220	112	332	220	112	332
C2.18 BACKFILL	11	6	17	11	6	17
TOTAL SOIL EXCAVATION	231	118	349	231	118	349
1.3.5.3 GROUNDWATER CNTRL						
C3.05 GROUNDWATER CONTROL	49	91	140	49	91	140
TOTAL GROUNDWATER CNTRL	49	91	140	49	91	140
1.3.5.4 SITE PREPARATION						
C4.05 SITE PREP,ROADS,FENCING	317	174	491	317	174	491
TOTAL SITE PREPARATION	317	174	491	317	174	491
1.3.5.5 GENERAL REQUIREMENTS						
C5.13 GENERAL REQUIREMENTS	131	1083	1214	131	1083	1214
C5.14 MOBILIZATION	169	7	176	169	7	176
C5.15 DEMOBILIZATION	182	37	219	182	37	219
TOTAL GENERAL REQUIREMENTS	482	1127	1609	482	1127	1609
1.3.6.1 SITE MAINT & EROSION CNTRL						
C4.06 SITE MAINTENANCE	214	312	526	214	312	526
TOTAL SITE MAINT & EROSION CNTRL	214	312	526	214	312	526
1.3.6.2 GROUNDWATER CONTROL						
C3.06 GROUNDWATER CTRL MAINTENANCE	28	88	116	28	88	116
TOTAL GROUNDWATER CONTROL	28	88	116	28	88	116
SUB - TOTAL	21369	13925	35294	21369	13925	35294

ACD - FORMER PLANT AREA

SUMMARY REPORT
$1 = $1000

05/17/1999

Arranged By: WBS / B/M Attribute

	Unescalated			Escalated		
	Material $	Labor $	Total $	Material $	Labor $	Total $
CONTINGENCY	0	0	0	0	0	0
GRAND TOTAL	21369	13925	35294	21369	13925	35294

009121

Creation Date 02/15/1999
Revision Number ... 0

Estimating Job Number ..

Project Estimator..
WBS ..... 1.3.1.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.01 CONCRETE FOUNDATIONS
Discipline ..... C CIVIL AND SITE
B/M Title ..... CONCRETE FOUNDATIONS

Project Engineer .....
Building/Area 3A
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.1 0

Cross-Cut Code ....
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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	DEMOLISH, SIZE REDUCE, LOAD AND HAUL CONCRETE						
	QTY.: 20641 BCY						
	PRODUCTION RATE: 48 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 7000 LF						
1 -A	CAT 345 TRACHOE W/ GRAPPLE(4 EACH)	Matl.	430.00	HRS	359.52	154,594	
		Labor	1,720	EQ	22.06	37,943	192,537
2 -A	CAT 345 TRACHOE W/ HOE RAM (4 EACH)	Matl.	430.00	HRS	400.00	172,000	
		Labor	1,720	EQ	22.06	37,943	209,943
3 -A	CAT 345 TRACHOE W/ SHEARS (4 EACH)	Matl.	430.00	HRS	521.28	224,150	
		Labor	1,720	EQ	22.06	37,943	262,093
4 -A	CAT 345 TRACHOE W/ JAW CRUSHERS (2 EACH)	Matl.	430.00	HRS	221.74	95,348	
		Labor	860	EQ	22.06	18,972	114,320
5 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	430.00	HRS	201.77	86,761	
		Labor	860	EQ	22.06	18,972	105,733
6 -A	SPOTTERS (4 EACH)	Matl.	430.00	HRS	0.00	0	
		Labor	1,720	DE	19.61	33,729	33,729
7 -A	OILERS (ASSUME 1 PER 4 PIECES HVY EQUIP.)	Matl.	430.00	HRS	0.00	0	
		Labor	1,720	EQ	22.06	37,943	37,943
8 -A	ACETYLENE TORCH SETUP (4 EACH)	Matl.	430.00	HRS	40.00	17,200	
		Labor	1,720	BL	20.50	35,260	52,460

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	430.00	HRS	74.27	31,936	
		Labor	430	EQ	22.06	9,486	41,422
10 -A	4000 GAL WATER TRUCK W/ HOSE AND	Matl.	430.00	HRS	99.70	42,871	
	WATER CANNON SPRAYER (4 EACH)	Labor	1,720	TD	20.78	35,742	78,613
11 -A	FOREMAN W/ TRUCK (2 EACH)	Matl.	430.00	HRS	20.00	8,600	
		Labor	860	FO	30.00	25,800	34,400
****	SUBTOTAL ****	Matl.				833,460	
		Labor	15,050			329,733	1,163,193
	BLASTING CREW (AT 50% OF DEMO HOURS)						
12 -A	INGERSOLL-RAND ECM 350/ VL671 AIR	Matl.	215.00	HRS	22.09	4,749	
	DRIVEN TRACK DRILL	Labor	215	EQ	22.06	4,743	9,492
13 -A	AIR COMPRESSOR, ROTARY SCREW, 260 HP,	Matl.	215.00	HRS	24.96	5,366	
	900 CFM	Labor	0		0.00	0	5,366
14 -A	LOADING CREW	Matl.	215.00	HRS	0.00	0	
		Labor	430	DE	19.61	8,432	8,432
15 -A	BLASTING SUPERVISOR	Matl.	215.00	HRS	0.00	0	
		Labor	215	FO	30.00	6,450	6,450
16 -A	BLASTING MATERIALS	Matl.	215.00	HRS	100.00	21,500	
		Labor	0		0.00	0	21,500
****	SUBTOTAL ****	Matl.				31,615	
		Labor	860			19,625	51,240
17 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	4,137	ZZ	21.96	90,842	90,842
18 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	636	ZZ	21.96	13,966	13,966

2250

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	865,075	454,166	1,319,241
TOTAL	865,075	(hrs. 20,683) 454,166	1,319,241

ACD - FORMER PLANT AREA

WBS ..... 1.3.1.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.06 ASPHALT REMOVAL
Discipline ..... C CIVIL AND SITE
B/M Title ..... ASPHALT REMOVAL

Cross-Cut Code ....
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Building/Area 3A
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.6 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	BREAKUP, LOAD AND HAUL ASPHALT PARKING SURFACE QTY.: 2156 BCY						
	PRODUCTION RATE: 105 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 7000 LF						
1 -A	CAT 345 TRACHOE	Matl.	21.00	HRS	76.97	1,616	
		Labor	21	EQ	22.06	463	2,079
2 -A	CAT D-8 DOZER	Matl.	21.00	HRS	105.19	2,209	
		Labor	21	EQ	22.06	463	2,672
3 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	21.00	HRS	201.77	4,237	
		Labor	42	EQ	22.06	927	5,164
4 -A	SPOTTERS (2 EACH)	Matl.	21.00	HRS	0.00	0	
		Labor	42	DE	19.61	824	824
5 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	21.00	HRS	74.27	1,560	
		Labor	21	EQ	22.06	463	2,023
6 -A	FOREMAN W/ TRUCK	Matl.	21.00	HRS	10.00	210	
		Labor	21	FO	30.00	630	840
****	SUBTOTAL ****	Matl.				9,832	
		Labor	168			3,770	13,602

000125

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	44	ZZ	22.44	987	987
8 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	7	ZZ	22.44	157	157

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	9,832	4,914	14,746
TOTAL	9,832	(hrs. 219) 4,914	14,746

WBS ..... 1.3.1.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.01 SOIL EXCAV ABV-WAC
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAV ABV-WAC

Cross-Cut Code ....
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Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.1 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	MATERIAL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO AREA 7 QTY.:4345 BCY						
	PRODUCTION RATE: 218 BCY/ HR						
	HAUL DISTANCE TO AREA 7(ROUND TRIP): 5000 LF						
1 -A	CAT 345 TRACHOE (1 EACH)	Matl.	20.00	HRS	76.97	1,539	
		Labor	20	EQ	22.06	441	1,980
2 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	20.00	HRS	201.77	4,035	
		Labor	40	EQ	22.06	882	4,917
3 -A	SPOTTERS (4 EACH)	Matl.	20.00	HRS	0.00	0	
		Labor	80	DE	19.61	1,569	1,569
4 -A	CAT D-8 DOZER	Matl.	20.00	HRS	105.19	2,104	
		Labor	20	EQ	22.06	441	2,545
5 -A	CAT 966 FE LOADER	Matl.	20.00	HRS	76.56	1,531	
		Labor	20	EQ	22.06	441	1,972
6 -A	DISC HARROW	Matl.	20.00	HRS	20.00	400	
		Labor	0		0.00	0	400
7 -A	OILER	Matl.	20.00	HRS	0.00	0	
		Labor	20	EQ	22.06	441	441
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	20.00	HRS	74.27	1,485	
		Labor	20	EQ	22.06	441	1,926

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	FOREMAN W/ TRUCK	Matl.	20.00	HRS	10.00	200	
		Labor	20	FO	30.00	600	800
10 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	82	ZZ	21.90	1,796	1,796
11 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	10	ZZ	21.90	219	219

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	11,294	7,271	18,565
TOTAL	11,294	(hrs. 332) 7,271	18,565

WBS ..... 1.3.1.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.05 TCE SOIL
Discipline ..... C CIVIL AND SITE
B/M Title ..... TCE SOIL

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.5 0

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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	TCE MATERIAL WILL BE EXCAVATED, LOADED IN SHIPPING BOX & HAULED TO PLANT 1 DISPOSAL OF THIS MATERIAL WILL BE BY OTHERS. QTY.:300 BCY						
	PRODUCTION RATE: 30 MIN. PER BOX INCLUDES DECON QTY. PER BOX: 2.5 CY (BASED ON 6000 LB MAX.) HAUL DISTANCE (ROUND TRIP): 2000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	72.00	HRS	76.97	5,542	
		Labor	72	EQ	22.06	1,588	7,130
2 -A	5 TON FLATBED TRUCK	Matl.	72.00	HRS	40.00	2,880	
		Labor	432	EQ	22.06	9,530	12,410
3 -A	SPOTTERS (4 EACH)	Matl.	72.00	HRS	0.00	0	
		Labor	288	DE	19.61	5,648	5,648
4 -A	ROUGH TERRAIN FORKLIFT	Matl.	72.00	HRS	25.00	1,800	
		Labor	72	EQ	22.06	1,588	3,388
5 -A	FOREMAN W/ TRUCK	Matl.	72.00	HRS	10.00	720	
		Labor	72	FO	30.00	2,160	2,880
	DECON CREW						
6 -A	PRESSURE WASHER	Matl.	72.00	HRS	28.00	2,016	
		Labor	288	L	19.45	5,602	7,618

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	ALLOWANCE FOR DECON AREA	Matl.	1.00	LOT	15,000.00	15,000	
		Labor	0		0.00	0	15,000
****	SUBTOTAL ****	Matl.				27,958	
		Labor	1,224			26,116	54,074
8 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	416	ZZ	21.34	8,876	8,876
9 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	49	ZZ	21.34	1,045	1,045

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	27,958	36,037	63,995
TOTAL	27,958	(hrs. 1,689) 36,037	63,995

ACD - FORMER PLANT AREA

WBS ..... 1.3.1.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.06 RCRA SOIL TREATMENT
Discipline ..... C CIVIL AND SITE
B/M Title ..... RCRA SOIL TREATMENT

Cross-Cut Code ....
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Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.6 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	ASSUMPTION: RCRA SOIL WILL BE TREATED IN-SITU, THEN EXCAVATED AND HAULED TO THE OSDF EXCAVATION AND HAUL COSTS ARE SHOWN WITH THE GENERAL EXCAVATION TASK. THE UNIT COST IS BASED ON MAECTITE INC. QTY: 24750 CY						
1 -A	IN-SITU SOIL TREATMENT COST IS TOTAL UNIT PRICE	Matl.	30,071.00	TON	100.00	3,007,100	
		Labor	0		0.00	0	3,007,100

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	3,007,100	0	3,007,100
TOTAL	3,007,100	(hrs. 0) 0	3,007,100

000131

ACD - FORMER PLANT AREA

WBS ..... 1.3.1.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.09 SOIL EXCAVATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAVATION

Cross-Cut Code ....
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Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.9 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	TOTAL QUANTITY OF SOIL: 193,410 BCY						
	GENERAL EXCAVATION: 168,575 BCY						
	IN-SITU TREATED RCRA SOIL: 24,750 BCY						
	CLAY PIPE: 85 BCY						
	ASSUME 30% OF THE SOIL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO THE OSDF QTY.:58023 BCY						
	PRODUCTION RATE: 100 BCY/ HR						
	HAUL DISTANCE (ROUND TRIP): 7000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	580.00	HRS	76.97	44,643	
		Labor	580	EQ	22.06	12,795	57,438
2 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	580.00	HRS	403.54	234,053	
		Labor	2,320	EQ	22.06	51,179	285,232
	2 TRUCKS HAULING FROM EXCAVATION TO DEWATERING AREA						
	2 TRUCKS HAULING FROM DEWATERING AREA TO OSDF						
3 -A	SPOTTERS (4 EACH)	Matl.	580.00	HRS	0.00	0	
		Labor	2,320	DE	19.61	45,495	45,495

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
4 -A	CAT D-8 DOZER	Matl.	580.00	HRS	105.19	61,010	
		Labor	580	EQ	22.06	12,795	73,805
5 -A	CAT 966 FE LOADER	Matl.	580.00	HRS	76.56	44,405	
		Labor	580	EQ	22.06	12,795	57,200
6 -A	DISC HARROW	Matl.	580.00	HRS	20.00	11,600	
		Labor	0		0.00	0	11,600
7 -A	OILER	Matl.	580.00	HRS	0.00	0	
		Labor	580	EQ	22.06	12,795	12,795
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	580.00	HRS	74.27	43,077	
		Labor	580	EQ	22.06	12,795	55,872
9 -A	FOREMAN W/ TRUCK	Matl.	580.00	HRS	10.00	5,800	
		Labor	580	FO	30.00	17,400	23,200
****	SUBTOTAL ****	Matl.				444,588	
		Labor	8,120			178,049	622,637
	ASSUME THE REMAINING 70% OF SOIL WILL BE EXCAVATED, LOADED AND HAULED TO THE OSDF						
	QTY.: 135,387 BCY						
	PRODUCTION RATE: 202 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 7000 LF						
10 -A	CAT 345 TRACHOE (2 EACH)	Matl.	671.00	HRS	153.94	103,294	
		Labor	1,342	EQ	22.06	29,605	132,899
11 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	671.00	HRS	403.54	270,775	
		Labor	2,684	EQ	22.06	59,209	329,984
12 -A	SPOTTERS (2 EACH)	Matl.	671.00	HRS	0.00	0	
		Labor	1,342	DE	19.61	26,317	26,317

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
13 -A	OILER	Matl.	671.00	HRS	0.00	0	
		Labor	671	EQ	22.06	14,802	14,802
14 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	671.00	HRS	74.27	49,835	
		Labor	671	EQ	22.06	14,802	64,637
15 -A	FOREMAN W/ TRUCK	Matl.	671.00	HRS	10.00	6,710	
		Labor	671	FO	30.00	20,130	26,840
****	SUBTOTAL ****	Matl.				430,614	
		Labor	7,381			164,865	595,479
16 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	4,030	ZZ	22.12	89,152	89,152
17 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	620	ZZ	22.12	13,716	13,716

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	875,202	445,782	1,320,984
TOTAL	875,202	(hrs. 20,151) 445,782	1,320,984

WBS ..... 1.3.1.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.14 BACKFILL
Discipline ..... C CIVIL AND SITE
B/M Title ..... BACKFILL

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Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.14 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	BACKFILL IN GENERAL EXCAVATION AREAS TO BACKFILL THE GMA 5' ENCROACMENTS QTY.: 245 FCY						
	PRODUCTION RATE: 112 FCY						
	ASSUME BORROW AREA ROUND TRIP HAUL DISTANCE: 12000' LOW PRODUCTION RATE DUE TO VARYING SIZE OF PLACEMENT AREAS						
	BORROW AREA INCLUDING HAUL						
1 -A	CAT D-8 DOZER	Matl.	4.00	HRS	105.19	421	
		Labor	4	EQ	22.06	88	509
2 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	4.00	HRS	76.97	308	
		Labor	4	EQ	22.06	88	396
3 -A	CAT D400 ARTICULATED DUMP TRUCKS (4 EACH)	Matl.	4.00	HRS	403.60	1,614	
		Labor	16	EQ	22.06	353	1,967
4 -A	SPOTTER	Matl.	4.00	HRS	0.00	0	
		Labor	4	L	19.45	78	78
5 -A	FOREMAN W/ TRUCK	Matl.	4.00	HRS	10.00	40	
		Labor	4	FO	30.00	120	160
	PLACEMENT						
6 -A	CAT D-6 DOZER	Matl.	4.00	HRS	57.93	232	
		Labor	4	EQ	22.06	88	320
7 -A	CAT D-8 DOZER	Matl.	4.00	HRS	105.19	421	
		Labor	4	EQ	22.06	88	509

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	CAT 825C COMPACTOR	Matl.	4.00	HRS	123.61	494	
		Labor	4	EQ	22.06	88	582
9 -A	CAT CS-563 ROLLER	Matl.	4.00	HRS	39.75	159	
		Labor	4	EQ	22.06	88	247
10 -A	SPOTTER	Matl.	4.00	HRS	0.00	0	
		Labor	4	L	19.45	78	78
****	SUBTOTAL ****	Matl.				3,689	
		Labor	52			1,157	4,846
	BACKFILL DIVERSION DIKES						
	QTY.: 685 FCY						
	PRODUCTION RATE: 56 FCY/HR						
	SMALL QUANTITY ASSUME 2 DAYS FOR THIS DIKE						
	ASSUME BORROW AREA ROUND TRIP HAUL DISTANCE: 12000'						
	LOW PRODUCTION RATE DUE TO SMALL CROSS SECTIONAL AREA OF DIKE						
	BORROW AREA INCLUDING HAUL						
11 -A	CAT D-8 DOZER	Matl.	20.00	HRS	105.19	2,104	
		Labor	20	EQ	22.06	441	2,545
12 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	20.00	HRS	76.97	1,539	
		Labor	20	EQ	22.06	441	1,980
13 -A	CAT D400 ARTICULATED DUMP TRUCKS (2 EACH)	Matl.	20.00	HRS	201.80	4,036	
		Labor	40	EQ	22.06	882	4,918
14 -A	SPOTTER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
15 -A	FOREMAN W/ TRUCK	Matl.	20.00	HRS	10.00	200	
		Labor	20	FO	30.00	600	800
	PLACEMENT						
16 -A	CAT D-6 DOZER	Matl.	20.00	HRS	57.93	1,159	
		Labor	20	EQ	22.06	441	1,600

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
17 -A	CAT CP-323 COMPACTOR	Matl.	20.00	HRS	48.63	973	
		Labor	20	EQ	22.06	441	1,414
18 -A	CAT CS-563 ROLLER (SEAL SURFACE ONLY)	Matl.	20.00	HRS	39.75	795	
		Labor	0		0.00	0	795
19 -A	SPOTTER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
20 -A	GRADE CHECKER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
****	SUBTOTAL ****	Matl.				10,806	
		Labor	200			4,413	15,219
21 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	66	ZZ	22.10	1,459	1,459
22 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	10	ZZ	22.10	221	221

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	14,495	7,250	21,745
TOTAL	14,495	(hrs. 328) 7,250	21,745

000137

ACD - FORMER PLANT AREA

WBS ..... 1.3.1.3 GROUNDWATER CNTRL
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C3.01 GROUNDWATER CONTROL
Discipline ..... C CIVIL AND SITE
B/M Title ..... GROUNDWATER CONTROL

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GW CONTROL
Quantity Take-Off By ... CIVIL
Trace Number C.3.1 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	GAS POWERED TRASH TYPE SUMP PUMPS						
1 -A	WACKER 4" DIA TRASH PUMP, 625 GPM @ 87' HD, 12 HP	Matl.	6.00	EA	7,240.00	43,440	
		Labor	0		0.00	0	43,440
2 -A	4" SUCTION HOSE, 200 PSI, ASSUME 100' PER PUMP ALLOWANCE FOR ABOVEGROUND PIPE - DRISCO	Matl.	600.00	LF	14.07	8,442	
		Labor	0		0.00	0	8,442
3 -A	ASSUME 4" AVERAGE SIZE	Matl.	5,000.00	LF	1.50	7,500	
		Labor	320	L	19.45	6,224	13,724
4 -A	CONNECTIONS TO EXISTING STORM DRAIN	Matl.	5.00	EA	250.00	1,250	
		Labor	40	L	19.45	778	2,028
5 -A	INSTALL NEW STORM DRAIN PIPE - ASSUME 36" RCP	Matl.	400.00	LF	45.00	18,000	
		Labor	311	EQ	22.06	6,861	24,861
****	SUBTOTAL ****	Matl.				78,632	
		Labor	671			13,863	92,495
	OPERATE PUMPS (ASSUME 4 HRS PER DAY)						
6 -A	OPERATOR	Matl.	18.00	MTH	100.00	1,800	
		Labor	1,566	EQ	22.06	34,546	36,346
7 -A	FLATBED TRUCK, 2-1/2 TON	Matl.	18.00	MTH	1,300.00	23,400	
		Labor	1,566	TD	20.78	32,541	55,941
****	SUBTOTAL ****	Matl.				25,200	
		Labor	3,132			67,087	92,287
	CONSTRUCT R.R. GROUNDWATER DITCH						
8 -A	REMOVE RAILROAD TRACK INCLUDING TIES	Matl.	1,000.00	LF	2.38	2,380	
		Labor	170	EQ	22.06	3,750	6,130

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	EXCAVATE, LOAD AND HAUL BALLAST	Matl.	371.00	CY	1.72	638	
		Labor	142	EQ	22.06	3,133	3,771
10 -A	HDPE LINER INCLUDING LABOR	Matl.	1,667.00	SY	4.50	7,502	
		Labor	0		0.00	0	7,502
11 -A	6" LAYER OF SAND	Matl.	93.00	CY	4.00	372	
		Labor	12	EQ	22.06	265	637
12 -A	PURCHASE AND DELIVERY OF SAND	Matl.	186.00	TON	9.00	1,674	
		Labor	0		0.00	0	1,674
13 -A	LINE DITCH W/ RIP RAP	Matl.	186.00	CY	8.00	1,488	
		Labor	48	EQ	22.06	1,059	2,547
14 -A	PURCHASE AND DELIVERY OF RIP RAP	Matl.	278.00	TON	15.00	4,170	
		Labor	0		0.00	0	4,170
****	SUBTOTAL ****	Matl.				18,224	
		Labor	372			8,207	26,431
	CONSTRUCT SEDIMENT PONDS						
	EXCAVATION IS COVERED BY GENERAL EXCAVATION						
	QTY.: 3 EACH						
	ANCHOR TRENCH AT TOP OF SLOPE TO SECURE LINER						
	LENGTH: 1340'						
	QTY.:100 CY						
	PRODUCTION: 10 CY/HR						
15 -A	CAT 446 BACKHOE	Matl.	10.00	HRS	18.85	189	
		Labor	10	EQ	22.06	221	410
16 -A	LABORERS (2 EACH)	Matl.	10.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
17 -A	FOREMAN W/ TRUCK	Matl.	10.00	HRS	10.00	100	
		Labor	10	FO	30.00	300	400
18 -A	INSTALL 40 MIL HDPE LINER, COST INCLUDES INSTALLATION	Matl.	4,786.00	SY	4.50	21,537	
		Labor	0		0.00	0	21,537

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
19 -A	SAND BAGS - ALLOWANCE	Matl.	1.00	LOT	750.00	750	
		Labor	0		0.00	0	750
****	SUBTOTAL ****	Matl.				22,576	
		Labor	40			910	23,486
	UPGRADE TANKFARM						
	ASSUME THAT ALL CONCRETE AND SOIL WILL BE DISPOSED IN OSDF						
20 -A	REMOVE CONCRETE PIERS	Matl.	34.00	CY	43.47	1,478	
		Labor	26	EQ	22.06	574	2,052
21 -A	REMOVE CONCRETE SLAB	Matl.	46.00	CY	43.47	2,000	
		Labor	35	EQ	22.06	772	2,772
22 -A	EXCAVATE SOIL LAYER BELOW TOP SLAB	Matl.	136.00	CY	3.79	515	
		Labor	9	EQ	22.06	199	714
****	SUBTOTAL ****	Matl.				3,993	
		Labor	70			1,545	5,538
23 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	1,114	ZZ	21.38	23,817	23,817
24 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	171	ZZ	21.38	3,656	3,656

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	148,625	119,085	267,710
TOTAL	148,625	(hrs. 5,570) 119,085	267,710

WBS ..... 1.3.1.4 SITE PREPARATION
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C4.01 SITE PREP,ROADS,FENCING
Discipline ..... C CIVIL AND SITE
B/M Title ..... SITE PREP,ROADS,FENCING

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SITE PREP
Quantity Take-Off By ... JLS
Trace Number C.4.1 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	BOUNDARY FENCING						
	OUTER PERIMETER (INCLUDING MAIN HAUL ROADS)						
1 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	9,800.00	LF	1.46	14,308	
		Labor	167	L	19.45	3,248	17,556
2 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	980.00	EA	6.36	6,233	
		Labor	98	L	19.45	1,906	8,139
	ABV-WAC AND RCRA AREAS						
3 -A	YELLOW AND MAGENTA STRIPED SAFETY BOUNDARY TAPE	Matl.	7,500.00	LF	0.17	1,275	
		Labor	7	L	19.45	136	1,411
4 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	750.00	EA	6.36	4,770	
		Labor	75	L	19.45	1,459	6,229
	SHUTTLE ACCESS CORRIDOR						
5 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	2,300.00	LF	1.46	3,358	
		Labor	39	L	19.45	759	4,117
6 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	230.00	EA	6.36	1,463	
		Labor	23	L	19.45	447	1,910
	DEEP EXCAVATIONS - ALLOWANCE						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	1,000.00	LF	1.46	1,460	
		Labor	17	L	19.45	331	1,791
8 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	100.00	EA	6.36	636	
		Labor	10	L	19.45	195	831
****	SUBTOTAL ****	Matl.				33,503	
		Labor	436			8,481	41,984
	INITIAL EROSION CONTROL INSTALLATION						
9 -A	SILT FENCE W/ WOOD STAKES	Matl.	1,600.00	LF	0.95	1,520	
		Labor	27	L	19.45	525	2,045
10 -A	CAT 446 BACKHOE	Matl.	14.00	HRS	18.85	264	
		Labor	14	EQ	22.06	309	573
11 -A	5 TON FLATBED TRUCK	Matl.	14.00	HRS	40.00	560	
		Labor	14	TD	20.78	291	851
12 -A	FOREMAN W/ PICKUP TRUCK	Matl.	14.00	HRS	10.00	140	
		Labor	14	FO	30.00	420	560
13 -A	SEEDING	Matl.	42.00	ACRE	1,500.00	63,000	
		Labor	0		0.00	0	63,000
****	SUBTOTAL ****	Matl.				65,484	
		Labor	69			1,545	67,029
	MAINTAIN EROSION CONTROL DURING CONSTRUCTION 1 WEEK PER MONTH @ 16 HRS/WK						
14 -A	5 TON FLATBED TRUCK	Matl.	18.00	MTH	640.00	11,520	
		Labor	288	TD	20.78	5,985	17,505
15 -A	CAT 446 BACKHOE	Matl.	18.00	MTH	301.60	5,429	
		Labor	288	EQ	22.06	6,353	11,782
16 -A	LABORERS	Matl.	18.00	MTH	0.00	0	
		Labor	576	L	19.45	11,203	11,203

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
17 -A	FOREMAN W/ PICKUP TRUCK	Matl.	18.00	MTH	160.00	2,880	
		Labor	288	FO	30.00	8,640	11,520
18 -A	SILT FENCE W/ WOOD STAKES ASSUME	Matl.	400.00	LF	0.95	380	
	REPLACING 25% OF EXISTING SILT FENCE	Labor	7	L	19.45	136	516
****	SUBTOTAL ****	Matl.				20,209	
		Labor	1,447			32,317	52,526
	CONSTRUCT MAIN HAUL ROADS						
	WIDTH: 24'						
	LENGTH: 830'						
	DEPTH: 1'						
	EARTHWORK PREPARATION ASSUME 12" DEEP						
	QTY.: 740 CY						
	PRODUCTION RATE: 120 FCY/ HR						
19 -A	D-8 DOZER	Matl.	7.00	HRS	105.19	736	
		Labor	7	EQ	22.06	154	890
20 -A	CAT 16H MOTOR GRADER	Matl.	7.00	HRS	110.25	772	
		Labor	7	EQ	22.06	154	926
21 -A	COMPACTOR 825C	Matl.	7.00	HRS	123.61	865	
		Labor	7	EQ	22.06	154	1,019
22 -A	CAT CS-563 ROLLER	Matl.	7.00	HRS	39.75	278	
		Labor	7	EQ	22.06	154	432
23 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	7.00	HRS	37.14	260	
		Labor	4	EQ	22.06	88	348
24 -A	SPOTTER (2 EACH)	Matl.	7.00	HRS	0.00	0	
		Labor	14	L	19.45	272	272
25 -A	FOREMAN W/ TRUCK	Matl.	7.00	HRS	10.00	70	
		Labor	7	FO	30.00	210	280

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
26 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	2,420.00	SY	1.50	3,630	
		Labor	17	L	19.45	331	3,961
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 740 CY						
	PRODUCTION RATE: 120 FCY/ HR						
27 -A	AGGREGATE BASE STONE	Matl.	1,258.00	TON	10.50	13,209	
		Labor	0		0.00	0	13,209
28 -A	D-8 DOZER	Matl.	7.00	HRS	105.19	736	
		Labor	7	EQ	22.06	154	890
29 -A	CAT 16H MOTOR GRADER	Matl.	7.00	HRS	110.25	772	
		Labor	7	EQ	22.06	154	926
30 -A	COMPACTOR 825C	Matl.	7.00	HRS	123.61	865	
		Labor	7	EQ	22.06	154	1,019
31 -A	CAT CS-563 ROLLER	Matl.	7.00	HRS	39.75	278	
		Labor	7	EQ	22.06	154	432
32 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	7.00	HRS	37.14	260	
		Labor	4	EQ	22.06	88	348
33 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	7.00	HRS	302.66	2,119	
		Labor	21	EQ	22.06	463	2,582
34 -A	SPOTTER (2 EACH)	Matl.	7.00	HRS	0.00	0	
		Labor	14	L	19.45	272	272
35 -A	FOREMAN W/ TRUCK	Matl.	7.00	HRS	10.00	70	
		Labor	7	FO	30.00	210	280
****	SUBTOTAL ****	Matl.				24,920	
		Labor	144			3,166	28,086

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	MAINTAIN HAUL ROADS (ASSUME 1 WEEK PER MONTH)						
36 -A	CAT 16H MOTOR GRADER	Matl.	18.00	MTH	4,410.00	79,380	
		Labor	720	EQ	22.06	15,883	95,263
37 -A	CAT CS-563 ROLLER	Matl.	18.00	MTH	1,590.00	28,620	
		Labor	720	EQ	22.06	15,883	44,503
38 -A	DUMP TRUCK	Matl.	18.00	MTH	1,600.00	28,800	
		Labor	720	TD	20.78	14,962	43,762
39 -A	SPOTTER (2 EACH)	Matl.	18.00	MTH	0.00	0	
		Labor	1,440	L	19.45	28,008	28,008
40 -A	FOREMAN W/ TRUCK	Matl.	18.00	MTH	400.00	7,200	
		Labor	720	FO	30.00	21,600	28,800
****	SUBTOTAL ****	Matl.				144,000	
		Labor	4,320			96,336	240,336
	CONSTRUCT TEMPORARY HAUL ROADS AND LOADING AREAS AT CONTRACTORS DISCRETION						
	WIDTH: 24'						
	LENGTH: 4100'						
	DEPTH: 1'						
	HAUL AND PLACE AGGREGATE BASE STONE						
	AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 3645 CY						
	PRODUCTION RATE: 160 FCY/ HR						
41 -A	AGGREGATE BASE STONE	Matl.	6,197.00	TON	10.50	65,069	
		Labor	0		0.00	0	65,069
42 -A	D-8 DOZER	Matl.	23.00	HRS	105.19	2,419	
		Labor	23	EQ	22.06	507	2,926

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
43 -A	CAT 16H MOTOR GRADER	Matl.	23.00	HRS	110.25	2,536	
		Labor	23	EQ	22.06	507	3,043
44 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	23.00	HRS	37.14	854	
		Labor	12	EQ	22.06	265	1,119
45 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	23.00	HRS	302.66	6,961	
		Labor	69	EQ	22.06	1,522	8,483
46 -A	SPOTTER (2 EACH)	Matl.	23.00	HRS	0.00	0	
		Labor	46	L	19.45	895	895
47 -A	FOREMAN W/ TRUCK	Matl.	23.00	HRS	10.00	230	
		Labor	23	FO	30.00	690	920
****	SUBTOTAL ****	Matl.				78,069	
		Labor	196			4,386	82,455
	ALLOWANCE FOR MAINTENANCE ROADS						
	CONSTRUCT MAINTENANCE ROADS AT COMPLETION OF GENERAL EXCAVATION						
	WIDTH: 24'						
	LENGTH: 6000'						
	DEPTH: 1'						
	GRADE AND COMPACT SUBGRADE						
	AREA: 16000 SY						
	PRODUCTION RATE: 720 SY/HR						
48 -A	CAT 16H MOTOR GRADER	Matl.	23.00	HRS	110.25	2,536	
		Labor	23	EQ	22.06	507	3,043
49 -A	COMPACTOR 825C	Matl.	23.00	HRS	123.61	2,843	
		Labor	23	EQ	22.06	507	3,350
50 -A	CAT CS-563 ROLLER	Matl.	23.00	HRS	39.75	914	
		Labor	23	EQ	22.06	507	1,421
51 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	23.00	HRS	37.14	854	
		Labor	12	EQ	22.06	265	1,119

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
52 -A	SPOTTER (2 EACH)	Matl.	23.00	HRS	0.00	0	
		Labor	46	L	19.45	895	895
53 -A	FOREMAN W/ TRUCK	Matl.	23.00	HRS	10.00	230	
		Labor	23	FO	30.00	690	920
54 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	17,600.00	SY	1.50	26,400	
		Labor	123	L	19.45	2,392	28,792
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 5334 CY						
	PRODUCTION RATE: 120 FCY/ HR						
55 -A	AGGREGATE BASE STONE	Matl.	9,068.00	TON	10.50	95,214	
		Labor	0		0.00	0	95,214
56 -A	D-8 DOZER	Matl.	45.00	HRS	105.19	4,734	
		Labor	45	EQ	22.06	993	5,727
57 -A	CAT 16H MOTOR GRADER	Matl.	45.00	HRS	110.25	4,961	
		Labor	45	EQ	22.06	993	5,954
58 -A	COMPACTOR 825C	Matl.	45.00	HRS	123.61	5,562	
		Labor	45	EQ	22.06	993	6,555
59 -A	CAT CS-563 ROLLER	Matl.	45.00	HRS	39.75	1,789	
		Labor	45	EQ	22.06	993	2,782
60 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	45.00	HRS	37.14	1,671	
		Labor	23	EQ	22.06	507	2,178
61 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	45.00	HRS	302.66	13,620	
		Labor	135	EQ	22.06	2,978	16,598
62 -A	SPOTTER (2 EACH)	Matl.	45.00	HRS	0.00	0	
		Labor	90	L	19.45	1,751	1,751
63 -A	FOREMAN W/ TRUCK	Matl.	45.00	HRS	10.00	450	
		Labor	45	FO	30.00	1,350	1,800

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
****	SUBTOTAL ****	Matl.				161,778	
		Labor	746			16,321	178,099
64 -A	ALLOWANCE FOR DECON STATIONS FOR ACCESS TO CLEAN AREAS AFTER CERTIFICATION	Matl.	2.00	LOT	20,000.00	40,000	
		Labor	0		0.00	0	40,000
****	SUBTOTAL ****	Matl.				40,000	
		Labor	0			0	40,000
65 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	1,913	ZZ	22.09	42,262	42,262
66 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	294	ZZ	22.09	6,495	6,495

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	567,963	211,309	779,272
TOTAL	567,963	(hrs. 9,565) 211,309	779,272

WBS ..... 1.3.1.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.01 GENERAL REQUIREMENTS
Discipline ..... C CIVIL AND SITE
B/M Title ..... GENERAL REQUIREMENTS

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... J.SMITH
Trace Number C.5.1 0

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
1 -A	PORTABLE COOL DOWN TRAILER, SELF CONTAINED POWER AND COOLING (2 EACH)	Matl.	18.00	MTH	500.00	9,000	
		Labor	0		0.00	0	9,000
2 -A	GENERATOR FOR COOL DOWN TRAILERS (2 EACH)	Matl.	18.00	MTH	40.00	720	
		Labor	0		0.00	0	720
3 -A	PORTABLE OFFICE TRAILER	Matl.	18.00	MTH	600.00	10,800	
		Labor	0		0.00	0	10,800
4 -A	SAFETY ENGINEER FULL TIME	Matl.	18.00	MTH	0.00	0	
		Labor	3,906	SE	40.00	156,240	156,240
5 -A	FIELD ENGINEER FULL TIME (2 EACH)	Matl.	36.00	MTH	0.00	0	
		Labor	7,812	FE	40.00	312,480	312,480
6 -A	SUPERIENTENDENT FULL TIME	Matl.	18.00	MTH	0.00	0	
		Labor	3,906	SU	50.00	195,300	195,300
7 -A	SECRETARY	Matl.	18.00	MTH	0.00	0	
		Labor	3,114	S	12.00	37,368	37,368
8 -A	SCHEDULER	Matl.	18.00	MTH	0.00	0	
		Labor	3,906	SD	30.00	117,180	117,180
9 -A	ESTIMATOR	Matl.	18.00	MTH	0.00	0	
		Labor	3,114	ES	30.00	93,420	93,420
10 -A	HEALTH PHYSICS TECHNICIAN (2 EACH)	Matl.	36.00	MTH	0.00	0	
		Labor	7,812	HP	30.00	234,360	234,360
11 -A	PICKUP TRUCKS 4X4, 8 EACH	Matl.	18.00	MTH	4,800.00	86,400	
		Labor	0		0.00	0	86,400

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
12 -A	PHONE	Matl.	18.00	MTH	300.00	5,400	
		Labor	0		0.00	0	5,400
13 -A	MISC. OFFICE EQUIPMENT	Matl.	1.00	LOT	25,000.00	25,000	
		Labor	0		0.00	0	25,000

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	137,320	1,146,348	1,283,668
TOTAL	137,320	(hrs. 33,570) 1,146,348	1,283,668

WBS ..... 1.3.1.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.02 MOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... MOBILIZATION

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.2 0

Cross-Cut Code ....
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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	** PROJECT MOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	42.00	EA	4,000.00	168,000	
		Labor	0		0.00	0	168,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176
7 -A	FLAT BED TRUCK - 5 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176

000151

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	20.00	EA	0.00	0	
		Labor	40	EQ	22.06	882	882
9 -A	CAT 613C WATER WAGON	Matl.	8.00	EA	240.00	1,920	
		Labor	96	EQ	22.06	2,118	4,038
10 -A	CAT 988 FE LOADER	Matl.	8.00	EA	120.00	960	
		Labor	64	EQ	22.06	1,412	2,372
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	40.00	EA	1,000.00	40,000	
		Labor	0		0.00	0	40,000
12 -A	CAT D8 DOZER	Matl.	8.00	EA	120.00	960	
		Labor	32	EQ	22.06	706	1,666
13 -A	CAT 446 BACKHOE	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
14 -A	CAT 16H GRADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
15 -A	CAT 825C COMPACTOR	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
16 -A	CAT CS-563 ROLLER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	16.00	EA	30.00	480	
		Labor	16	EQ	22.06	353	833

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	216,400	11,382	227,782
TOTAL	216,400	(hrs. 516) 11,382	227,782

000153

ACD - FORMER PLANT AREA

WBS ..... 1.3.1.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.03 DEMOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... DEMOBILIZATION

Cross-Cut Code ....
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Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.3 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3A						
	** PROJECT DEMOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	42.00	EA	4,000.00	168,000	
		Labor	0		0.00	0	168,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176
7 -A	FLAT BED TRUCK - 5 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	20.00	EA	0.00	0	
		Labor	40	EQ	22.06	882	882
9 -A	CAT 613C WATER WAGON	Matl.	8.00	EA	240.00	1,920	
		Labor	96	EQ	22.06	2,118	4,038
10 -A	CAT 988 FE LOADER	Matl.	8.00	EA	120.00	960	
		Labor	64	EQ	22.06	1,412	2,372
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	40.00	EA	1,000.00	40,000	
		Labor	0		0.00	0	40,000
12 -A	CAT D8 DOZER	Matl.	8.00	EA	120.00	960	
		Labor	32	EQ	22.06	706	1,666
13 -A	CAT 446 BACKHOE	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
14 -A	CAT 16H GRADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
15 -A	CAT 825C COMPACTOR	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
16 -A	CAT CS-563 ROLLER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	8.00	EA	30.00	240	
		Labor	8	EQ	22.06	176	416
	DECONTAMINATION OF EQUIPMENT BEFORE TRANSPORT OFF-SITE						
20 -A	DECON THROUGH FREE RELEASE WASH STATION	Matl.	190.00	PCS	100.00	19,000	
		Labor	2,280	L	19.45	44,346	63,346

2250

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	235,160	55,551	290,711
TOTAL	235,160	(hrs. 2,788) 55,551	290,711

ACD - FORMER PLANT AREA

WBS ..... 1.3.1.6 URGRADE RIMIA FACILITY
Cost Code ..... 3000 NEW BUILDINGS AND ADDITIONS
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... A6.01 DEMOLITION
Discipline ..... A ARCHITECTURAL
B/M Title ..... DEMO

Cross-Cut Code ....
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Building/Area 52
Plant Site .....
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... RIMIA
Quantity Take-Off By ... RSF
Trace Number A.6.1 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
1 -A	REMOVE WIRE MESH PARITIONS (APPROX. 1000 SF)	Matl.	1.00	LOT	0.00	0	
		Labor	24	DE	19.61	471	471
2 -A	REMOVE MODULAR OFFICE	Matl.	1.00	EA	0.00	0	
		Labor	32	DE	19.61	628	628
3 -A	REMOVE 8X12 ROLLING DOOR	Matl.	1.00	EA	0.00	0	
		Labor	4	DE	19.61	78	78
4 -A	SEAL OPENING W/CMU	Matl.	96.00	SF	1.25	120	
		Labor	10	BL	20.50	205	325
5 -A	REMOVE 3-0 DOOR	Matl.	1.00	EA	0.00	0	
		Labor	1	DE	19.61	20	20
6 -A	TRUCK W/DRIVER	Matl.	24.00	HRS	20.00	480	
		Labor	24	DE	19.61	471	951
****	SUBTOTAL ****	Matl.				600	
		Labor	95			1,873	2,473
7 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	25	ZZ	19.72	493	493
8 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	4	ZZ	19.72	79	79

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	600	2,445	3,045
TOTAL	600	(hrs. 124) 2,445	3,045

WBS ..... 1.3.1.6 URGRADE RIMIA FACILITY
Cost Code ..... 3000 NEW BUILDINGS AND ADDITIONS
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... A6.02 ARCH CONSTRUCTION
Discipline ..... A ARCHITECTURAL
B/M Title ..... ARCH

Building/Area 52
Plant Site .....
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... RIMIA
Quantity Take-Off By ... RSF
Trace Number A.6.2 0

Cross-Cut Code ....
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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	** NEW CONSTRUCTION **						
	WALLS:						
1 -A	CMU WALLS @ CHANGE AREAS - 8" REINFORCED	Matl.	1,800.00	SF	1.90	3,420	
		Labor	200	BL	20.50	4,100	7,520
	CEILINGS:						
2 -A	HARD CAP ROOF - BAR JOISTS W/METAL DECK	Matl.	1,550.00	SF	2.10	3,255	
		Labor	62	BL	20.50	1,271	4,526
3 -A	ACOUSTICAL CEILING	Matl.	1,550.00	SF	1.20	1,860	
		Labor	25	BL	20.50	513	2,373
	FLOOR:						
4 -A	V.T. FLOORING	Matl.	1,550.00	SF	1.95	3,023	
		Labor	25	BL	20.50	513	3,536
	DOORS:						
5 -A	HMD - 3X7 W/FRAME & HARDWARE	Matl.	4.00	EA	280.00	1,120	
		Labor	16	BL	20.50	328	1,448
6 -A	HMD - 6X7 W/FRAME & HARDEWARE	Matl.	1.00	EA	580.00	580	
		Labor	6	BL	20.50	123	703
7 -A	FRAMES @ OPENINGS, 3X7	Matl.	2.00	EA	65.00	130	
		Labor	2	BL	20.50	41	171

000159

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	PAINTING	Matl.	1.00	LOT	150.00	150	
		Labor	24	BL	20.50	492	642
	PLUMBING FIXTURES W/TRIM & ROUGH-IN:						
9 -A	LAVATORIES (WALL HUNG)	Matl.	4.00	EA	300.00	1,200	
		Labor	64	BL	20.50	1,312	2,512
10 -A	URINAL (WALL HUNG)	Matl.	3.00	EA	315.00	945	
		Labor	48	BL	20.50	984	1,929
11 -A	WATER CLOSET (FLOOR MOUNT)	Matl.	5.00	EA	235.00	1,175	
		Labor	80	BL	20.50	1,640	2,815
12 -A	SHOWER - F/G ONE PIECE	Matl.	6.00	EA	330.00	1,980	
		Labor	144	BL	20.50	2,952	4,932
13 -A	METAL LOCKERS, SINGLE TIER	Matl.	12.00	EA	150.00	1,800	
		Labor	12	BL	20.50	246	2,046
	SPECIAL EQUIPMENT: (ALLOWANCES)						
14 -A	BADGE RACK	Matl.	1.00	EA	250.00	250	
		Labor	4	BL	20.50	82	332
15 -A	HAND/FOOT MONITORS	Matl.	6.00	EA	1,250.00	7,500	
		Labor	36	BL	20.50	738	8,238
16 -A	COMPUTER BADGING STATION	Matl.	1.00	EA	1,500.00	1,500	
		Labor	8	BL	20.50	164	1,664
17 -A	CANOPY COVER @ BLDG EXTERIOR	Matl.	160.00	SF	10.00	1,600	
		Labor	18	BL	20.50	369	1,969
18 -A	ALLOWANCE TO CONVERT TRIPLEX TRAILERS	Matl.	1.00	LS	500.00	500	
	TO BREAK TRAILER	Labor	40	BL	20.50	820	1,320
19 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	212	ZZ	20.50	4,346	4,346

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
20 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	33	ZZ	20.50	677	677

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	31,988	21,711	53,699
TOTAL	31,988	(hrs. 1,059) 21,711	53,699

000161

ACD - FORMER PLANT AREA

WBS ..... 1.3.1.6 URGRADE RIMIA FACILITY
Cost Code ..... 3000 NEW BUILDINGS AND ADDITIONS
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... A6.03 MECHANCIAL
Discipline ..... A. ARCHITECTURAL
B/M Title ..... MECHANICAL

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Building/Area 52
Plant Site .....
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... RIMIA
Quantity Take-Off By ... RSF
Trace Number A.6.3 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
1 -A	PACKAGED STEAM BOILER, ELECTRIC, 75 BHP @ 50 PSIG (ESTIMATED BY FDF ENGINEERING)	Matl.	1.00	EA	40,000.00	40,000	
		Labor	0		0.00	0	40,000
2 -A	WATER HEATER - ELECTRIC, COMMERICAL GRADE, 100 GAL	Matl.	1.00	EA	3,200.00	3,200	
		Labor	8	BL	20.50	164	3,364
3 -A	WATER SOFTENER SYSTEM	Matl.	1.00	EA	2,350.00	2,350	
		Labor	14	BL	20.50	287	2,637
4 -A	POTABLE WATER PIPING - 1 1/2"	Matl.	100.00	LF	2.25	225	
		Labor	20	BL	20.50	410	635
5 -A	FITTING & VALVE ALLOWANCE	Matl.	1.00	LS	50.00	50	
		Labor	6	BL	20.50	123	173
6 -A	SANITARY DRAIN - 3" C.I.	Matl.	125.00	LF	5.95	744	
		Labor	33	BL	20.50	677	1,421
7 -A	FITTING ALLOWANCE	Matl.	1.00	LS	150.00	150	
		Labor	12	BL	20.50	246	396
8 -A	STORM SEWER - 6" D.I.	Matl.	80.00	LF	7.90	632	
		Labor	15	BL	20.50	308	940
9 -A	TRENCHING	Matl.	80.00	LF	5.00	400	
		Labor	8	EQ	22.06	176	576
10 -A	TIE-INS	Matl.	2.00	EA	25.00	50	
		Labor	4	BL	20.50	82	132
11 -A	EXISTING TRENCH DRAINS - FILL W/SAND & CAP W/CONCRETE	Matl.	20.00	LF	5.00	100	
		Labor	8	BL	20.50	164	264

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
12 -A	TIE-IN TO EXISTING BLDG HVAC SYSTEM	Matl.	1.00	LS	250.00	250	
	(ASSUME ADEQUATE CAPACITY TO HEAT &	Labor	40	SW	23.90	956	1,206
	COOL CHANGE AREAS)						
13 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	44	ZZ	21.39	941	941
14 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	7	ZZ	21.39	150	150

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	48,151	4,684	52,835
TOTAL	48,151	(hrs. 219) 4,684	52,835

000163

2250

WBS ..... 1.3.1.6 URGRADE RIMIA FACILITY
Cost Code ..... 3000 NEW BUILDINGS AND ADDITIONS
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... A6.04 ELECTRICAL
Discipline ..... A ARCHITECTURAL
B/M Title ..... ELECTRICAL

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Building/Area 52
Plant Site .....
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... RIMIA
Quantity Take-Off By ... RSF
Trace Number A.6.4 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
1 -A	LIGHTING ALLOWANCE	Matl.	1,550.00	SF	0.90	1,395	
		Labor	80	EL	20.56	1,645	3,040
2 -A	SWITCHES & RECEPTACLES	Matl.	1,550.00	SF	0.30	465	
		Labor	40	EL	20.56	822	1,287
3 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	31	ZZ	20.56	637	637
4 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	5	ZZ	20.56	103	103

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	1,860	3,207	5,067
TOTAL	1,860	(hrs. 156) 3,207	5,067

WBS ..... 1.3.1.6 URGRADE RIMIA FACILITY
Cost Code ..... 3000 NEW BUILDINGS AND ADDITIONS
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... A6.05 WHEEL WASH STATION
Discipline ..... A ARCHITECTURAL
B/M Title ..... WHEEL WASH STATION

Building/Area 52
Plant Site .....
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... RIMIA
Quantity Take-Off By ... JLS
Trace Number A.6.5 0

Cross-Cut Code ....
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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
1 -A	PORTABLE WHEEL WASH STATIONS W/ 2 STEAM CLEANERS	Matl.	1.00	EA	200,000.00	200,000	
		Labor	0		0.00	0	200,000
2 -A	SETUP STATION	Matl.	1.00	LOT	200.00	200	
		Labor	32	L	19.45	622	822
3 -A	TRUCK	Matl.	1.00	LOT	320.00	320	
		Labor	8	TD	20.78	166	486
4 -A	WATER HOOKUP ALLOWANCE	Matl.	1.00	LOT	250.00	250	
		Labor	8	PF	34.86	279	529
5 -A	ELECTRICAL HOOKUP ALLOWANCE	Matl.	1.00	LOT	250.00	250	
		Labor	8	E	36.01	288	538
6 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	15	ZZ	24.20	363	363
7 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	2	ZZ	24.20	48	48

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	201,020	1,766	202,786
TOTAL	201,020	(hrs. 73) 1,766	202,786

WBS ..... 1.3.2.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.02 CONCRETE FOUNDATIONS
Discipline ..... C CIVIL AND SITE
B/M Title ..... CONCRETE FOUNDATIONS

Cross-Cut Code ....
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Building/Area 3B
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.2 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	DEMOLISH, SIZE REDUCE, LOAD AND HAUL CONCRETE						
	QTY.: 27216 BCY						
	PRODUCTION RATE: 48 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 9000 LF						
1 -A	CAT 345 TRACHOE W/ GRAPPLE(4 EACH)	Matl.	567.00	HRS	359.52	203,848	
		Labor	2,268	EQ	22.06	50,032	253,880
2 -A	CAT 345 TRACHOE W/ HOE RAM (4 EACH)	Matl.	567.00	HRS	400.00	226,800	
		Labor	2,268	EQ	22.06	50,032	276,832
3 -A	CAT 345 TRACHOE W/ SHEARS (4 EACH)	Matl.	567.00	HRS	521.28	295,566	
		Labor	2,268	EQ	22.06	50,032	345,598
4 -A	CAT 345 TRACHOE W/ JAW CRUSHERS (2 EACH)	Matl.	567.00	HRS	221.74	125,727	
		Labor	1,134	EQ	22.06	25,016	150,743
5 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	567.00	HRS	201.77	114,404	
		Labor	1,134	EQ	22.06	25,016	139,420
6 -A	SPOTTERS (4 EACH)	Matl.	567.00	HRS	0.00	0	
		Labor	2,268	DE	19.61	44,475	44,475
7 -A	OILERS (ASSUME 1 PER 4 PIECES HVY EQUIP.)	Matl.	567.00	HRS	0.00	0	
		Labor	2,268	EQ	22.06	50,032	50,032
8 -A	ACETYLENE TORCH SETUP (4 EACH)	Matl.	567.00	HRS	40.00	22,680	
		Labor	2,268	BL	20.50	46,494	69,174

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	567.00	HRS	74.27	42,111	
		Labor	567	EQ	22.06	12,508	54,619
10 -A	4000 GAL WATER TRUCK W/ HOSE AND WATER CANNON SPRAYER (4 EACH)	Matl.	567.00	HRS	99.70	56,530	
		Labor	2,268	TD	20.78	47,129	103,659
11 -A	FOREMAN W/ TRUCK (2 EACH)	Matl.	567.00	HRS	20.00	11,340	
		Labor	1,134	FO	30.00	34,020	45,360
****	SUBTOTAL ****	Matl.				1,099,006	
		Labor	19,845			434,786	1,533,792
	BLASTING CREW (AT 50% OF DEMO HOURS)						
12 -A	INGERSOLL-RAND ECM 350/ VL671 AIR DRIVEN TRACK DRILL	Matl.	284.00	HRS	22.09	6,274	
		Labor	284	EQ	22.06	6,265	12,539
13 -A	AIR COMPRESSOR, ROTARY SCREW, 260 HP, 900 CFM	Matl.	284.00	HRS	24.96	7,089	
		Labor	0		0.00	0	7,089
14 -A	LOADING CREW	Matl.	284.00	HRS	0.00	0	
		Labor	568	DE	19.61	11,138	11,138
15 -A	BLASTING SUPERVISOR	Matl.	284.00	HRS	0.00	0	
		Labor	284	FO	30.00	8,520	8,520
16 -A	BLASTING MATERIALS	Matl.	284.00	HRS	100.00	28,400	
		Labor	0		0.00	0	28,400
****	SUBTOTAL ****	Matl.				41,763	
		Labor	1,136			25,923	67,686
17 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	5,455	ZZ	21.96	119,783	119,783
18 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	839	ZZ	21.96	18,423	18,423

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	1,140,769	598,915	1,739,684
TOTAL	1,140,769	(hrs. 27,275) 598,915	1,739,684

WBS ..... 1.3.2.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.07 ASPHALT REMOVAL
Discipline ..... C CIVIL AND SITE
B/M Title ..... ASPHALT REMOVAL

Cross-Cut Code ....
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Building/Area 3B
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.7 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	BREAKUP, LOAD AND HAUL ASPHALT PARKING SURFACE QTY.: 2156 BCY						
	PRODUCTION RATE: 96 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 9000 LF						
1 -A	CAT 345 TRACHOE	Matl.	23.00	HRS	76.97	1,770	
		Labor	23	EQ	22.06	507	2,277
2 -A	CAT D-8 DOZER	Matl.	23.00	HRS	105.19	2,419	
		Labor	23	EQ	22.06	507	2,926
3 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	23.00	HRS	201.77	4,641	
		Labor	46	EQ	22.06	1,015	5,656
4 -A	SPOTTERS (2 EACH)	Matl.	23.00	HRS	0.00	0	
		Labor	46	DE	19.61	902	902
5 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	23.00	HRS	74.27	1,708	
		Labor	23	EQ	22.06	507	2,215
6 -A	FOREMAN W/ TRUCK	Matl.	23.00	HRS	10.00	230	
		Labor	23	FO	30.00	690	920
****	SUBTOTAL ****	Matl.				10,768	
		Labor	184			4,128	14,896

2250

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	48	ZZ	22.43	1,077	1,077
8 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	7	ZZ	22.43	157	157

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	10,768	5,362	16,130
TOTAL	10,768	(hrs. 239) 5,362	16,130

WBS ..... 1.3.2.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.02 SOIL EXCAV ABV-WAC
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAV ABV-WAC

Cross-Cut Code ....
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Building/Area 3B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.2 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	MATERIAL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO AREA 7 QTY.:21525 BCY						
	PRODUCTION RATE: 218 BCY/ HR						
	HAUL DISTANCE TO AREA 7(ROUND TRIP): 5000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	99.00	HRS	76.97	7,620	
		Labor	99	EQ	22.06	2,184	9,804
2 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	99.00	HRS	201.77	19,975	
		Labor	594	EQ	22.06	13,104	33,079
3 -A	SPOTTERS (4 EACH)	Matl.	99.00	HRS	0.00	0	
		Labor	396	DE	19.61	7,766	7,766
4 -A	CAT D-8 DOZER	Matl.	99.00	HRS	105.19	10,414	
		Labor	99	EQ	22.06	2,184	12,598
5 -A	CAT 966 FE LOADER	Matl.	99.00	HRS	76.56	7,579	
		Labor	99	EQ	22.06	2,184	9,763
6 -A	DISC HARROW	Matl.	99.00	HRS	20.00	1,980	
		Labor	0		0.00	0	1,980
7 -A	OILER	Matl.	99.00	HRS	0.00	0	
		Labor	99	EQ	22.06	2,184	2,184
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	99.00	HRS	74.27	7,353	
		Labor	99	EQ	22.06	2,184	9,537

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	FOREMAN W/ TRUCK	Matl.	99.00	HRS	10.00	990	
		Labor	99	FO	30.00	2,970	3,960
****	SUBTOTAL ****	Matl.				55,911	
		Labor	1,584			34,760	90,671
10 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	539	ZZ	21.94	11,828	11,828
11 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	63	ZZ	21.94	1,383	1,383

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	55,911	47,971	103,882
TOTAL	55,911	(hrs. 2,186) 47,971	103,882

ACD - FORMER PLANT AREA

WBS ..... 1.3.2.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.07 RCRA SOIL TREATMENT
Discipline ..... C CIVIL AND SITE
B/M Title ..... RCRA SOIL TREATMENT

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Building/Area 3B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.7 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	ASSUMPTION: RCRA SOIL WILL BE TREATED IN-SITU, THEN EXCAVATED AND HAULED TO THE OSDF EXCAVATION AND HAUL COSTS ARE SHOWN WITH THE GENERAL EXCAVATION TASK. THE UNIT COST IS BASED ON MAECTITE INC. QTY: 225 CY						
1 -A	IN-SITU SOIL TREATMENT COST IS TOTAL UNIT PRICE	Matl.	274.00	TON	100.00	27,400	
		Labor	0		0.00	0	27,400

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	27,400	0	27,400
TOTAL	27,400	(hrs. 0) 0	27,400

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ACD - FORMER PLANT AREA

WBS ..... 1.3.2.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.10 SOIL EXCAVATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAVATION

Cross-Cut Code ....
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Building/Area 3B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.10 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	TOTAL QUANTITY OF SOIL: 133,391 BCY						
	GENERAL EXCAVATION: 133,126 BCY						
	IN-SITU TREATED RCRA SOIL: 225 BCY						
	CLAY PIPE: 40 BCY						
	ASSUME 30% OF THE SOIL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO THE OSDF QTY.: 40017 BCY						
	PRODUCTION RATE: 100 BCY/ HR						
	HAUL DISTANCE (ROUND TRIP): 9000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	400.00	HRS	76.97	30,788	
		Labor	400	EQ	22.06	8,824	39,612
2 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	400.00	HRS	403.54	161,416	
		Labor	1,600	EQ	22.06	35,296	196,712
	2 TRUCKS HAULING FROM EXCAVATION TO DEWATERING AREA						
	2 TRUCKS HAULING FROM DEWATERING AREA TO OSDF						
3 -A	SPOTTERS (4 EACH)	Matl.	400.00	HRS	0.00	0	
		Labor	1,600	DE	19.61	31,376	31,376

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
4 -A	CAT D-8 DOZER	Matl.	400.00	HRS	105.19	42,076	
		Labor	400	EQ	22.06	8,824	50,900
5 -A	CAT 966 FE LOADER	Matl.	400.00	HRS	76.56	30,624	
		Labor	400	EQ	22.06	8,824	39,448
6 -A	DISC HARROW	Matl.	400.00	HRS	20.00	8,000	
		Labor	0		0.00	0	8,000
7 -A	OILER	Matl.	400.00	HRS	0.00	0	
		Labor	400	EQ	22.06	8,824	8,824
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	400.00	HRS	74.27	29,708	
		Labor	400	EQ	22.06	8,824	38,532
9 -A	FOREMAN W/ TRUCK	Matl.	400.00	HRS	10.00	4,000	
		Labor	400	FO	30.00	12,000	16,000
****	SUBTOTAL ****	Matl.				306,612	
		Labor	5,600			122,792	429,404
	ASSUME THE REMAINING 70% OF SOIL WILL BE EXCAVATED, LOADED AND HAULED TO THE OSDF						
	QTY.: 93374 BCY						
	PRODUCTION RATE: 202 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 9000 LF						
10 -A	CAT 345 TRACHOE (2 EACH)	Matl.	463.00	HRS	153.94	71,274	
		Labor	926	EQ	22.06	20,428	91,702
11 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	463.00	HRS	403.54	186,839	
		Labor	1,852	EQ	22.06	40,855	227,694
12 -A	SPOTTERS (2 EACH)	Matl.	463.00	HRS	0.00	0	
		Labor	926	DE	19.61	18,159	18,159

2250

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
13 -A	OILER	Matl.	463.00	HRS	0.00	0	
		Labor	463	EQ	22.06	10,214	10,214
14 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	463.00	HRS	74.27	34,387	
		Labor	463	EQ	22.06	10,214	44,601
15 -A	FOREMAN W/ TRUCK	Matl.	463.00	HRS	10.00	4,630	
		Labor	463	FO	30.00	13,890	18,520
****	SUBTOTAL ****	Matl.				297,130	
		Labor	5,093			113,760	410,890
16 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	2,780	ZZ	22.12	61,500	61,500
17 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	428	ZZ	22.12	9,468	9,468

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	603,742	307,520	911,262
TOTAL	603,742	(hrs. 13,901) 307,520	911,262

WBS ..... 1.3.2.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.15 BACKFILL
Discipline ..... C CIVIL AND SITE
B/M Title ..... BACKFILL

Building/Area 3B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.15 0

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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	BACKFILL DIVERSION DIKES						
	QTY.: 770 FCY						
	PRODUCTION RATE: 56 FCY/HR						
	SMALL QUANTITY ASSUME 2 DAYS FOR THIS DIKE						
	ASSUME BORROW AREA ROUND TRIP HAUL DISTANCE: 12000'						
	LOW PRODUCTION RATE DUE TO SMALL CROSS SECTIONAL AREA OF DIKE						
	BORROW AREA INCLUDING HAUL						
1 -A	CAT D-8 DOZER	Matl.	20.00	HRS	105.19	2,104	
		Labor	20	EQ	22.06	441	2,545
2 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	20.00	HRS	76.97	1,539	
		Labor	20	EQ	22.06	441	1,980
3 -A	CAT D400 ARTICULATED DUMP TRUCKS (2 EACH)	Matl.	20.00	HRS	201.80	4,036	
		Labor	40	EQ	22.06	882	4,918
4 -A	SPOTTER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
5 -A	FOREMAN W/ TRUCK	Matl.	20.00	HRS	10.00	200	
		Labor	20	FO	30.00	600	800
	PLACEMENT						
6 -A	CAT D-6 DOZER	Matl.	20.00	HRS	57.93	1,159	
		Labor	20	EQ	22.06	441	1,600

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	CAT CP-323 COMPACTOR	Matl.	20.00	HRS	48.63	973	
		Labor	20	EQ	22.06	441	1,414
8 -A	CAT CS-563 ROLLER (SEAL SURFACE ONLY)	Matl.	20.00	HRS	39.75	795	
		Labor	0		0.00	0	795
9 -A	SPOTTER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
10 -A	GRADE CHECKER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
****	SUBTOTAL ****	Matl.				10,806	
		Labor	200			4,413	15,219
11 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	52	ZZ	22.07	1,147	1,147
12 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	8	ZZ	22.07	177	177

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	10,806	5,737	16,543
TOTAL	10,806	(hrs. 260) 5,737	16,543

WBS ..... 1.3.2.3 GROUNDWATER CNTRL
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C3.02 GROUNDWATER CONTROL
Discipline ..... C CIVIL AND SITE
B/M Title ..... GROUNDWATER CONTROL

Cross-Cut Code ....
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Building/Area 3B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GW CONTROL
Quantity Take-Off By ... CIVIL
Trace Number C.3.2 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	GAS POWERED TRASH TYPE SUMP PUMPS						
1 -A	WACKER 4" DIA TRASH PUMP, 625 GPM @ 87' HD, 12 HP	Matl.	6.00	EA	7,240.00	43,440	
		Labor	0		0.00	0	43,440
2 -A	4" SUCTION HOSE, 200 PSI, ASSUME 100' PER PUMP ALLOWANCE FOR ABOVEGROUND PIPE - DRISCO	Matl.	600.00	LF	14.07	8,442	
		Labor	0		0.00	0	8,442
3 -A	ASSUME 4" AVERAGE SIZE	Matl.	5,000.00	LF	1.50	7,500	
		Labor	320	L	19.45	6,224	13,724
4 -A	CONNECTIONS TO EXISTING STORM DRAIN	Matl.	1.00	EA	250.00	250	
		Labor	8	L	19.45	156	406
5 -A	INSTALL NEW STORM DRAIN PIPE - ASSUME 36" RCP	Matl.	250.00	LF	45.00	11,250	
		Labor	195	EQ	22.06	4,302	15,552
	OPERATE PUMPS (ASSUME 4 HRS PER DAY)						
6 -A	OPERATOR	Matl.	10.00	MTH	100.00	1,000	
		Labor	870	EQ	22.06	19,192	20,192
7 -A	FLATBED TRUCK, 2-1/2 TON	Matl.	10.00	MTH	1,300.00	13,000	
		Labor	870	TD	20.78	18,079	31,079
	CONSTRUCT SEDIMENT PONDS						
	EXCAVATION IS COVERED BY GENERAL EXCAVATION QTY.: 1 EACH						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	ANCHOR TRENCH AT TOP OF SLOPE TO SECURE LINER						
	* LENGTH: 460'						
	QTY.:35 CY						
	PRODUCTION: 10 CY/HR						
8 -A	CAT 446 BACKHOE	Matl.	4.00	HRS	18.85	75	
		Labor	4	EQ	22.06	88	163
9 -A	LABORERS (2 EACH)	Matl.	4.00	HRS	0.00	0	
		Labor	8	L	19.45	156	156
10 -A	FOREMAN W/ TRUCK	Matl.	4.00	HRS	10.00	40	
		Labor	4	FO	30.00	120	160
11 -A	INSTALL 40 MIL HDPE LINER, COST	Matl.	1,634.00	SY	4.50	7,353	
	INCLUDES INSTALLATION	Labor	0		0.00	0	7,353
12 -A	SAND BAGS - ALLOWANCE	Matl.	1.00	LOT	250.00	250	
		Labor	0		0.00	0	250
13 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	593	ZZ	21.20	12,572	12,572
14 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	91	ZZ	21.20	1,929	1,929

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	92,600	62,818	155,418
TOTAL	92,600	(hrs. 2,963) 62,818	155,418

WBS ..... 1.3.2.4 SITE PREPARATION
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C4.02 SITE PREP,ROADS,FENCING
Discipline ..... C CIVIL AND SITE
B/M Title ..... SITE PREP,ROADS,FENCING

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SITE PREP
Quantity Take-Off By ... JLS
Trace Number C.4.2 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	BOUNDARY FENCING						
	OUTER PERIMETER (INCLUDING MAIN HAUL ROADS)						
1 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	9,100.00	LF	1.46	13,286	
		Labor	155	L	19.45	3,015	16,301
2 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	910.00	EA	6.36	5,788	
		Labor	91	L	19.45	1,770	7,558
	ABV-WAC AND RCRA AREAS						
3 -A	YELLOW AND MAGENTA STRIPED SAFETY BOUNDARY TAPE	Matl.	4,600.00	LF	0.17	782	
		Labor	5	L	19.45	97	879
4 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	460.00	EA	6.36	2,926	
		Labor	46	L	19.45	895	3,821
	SHUTTLE ACCESS CORRIDOR						
5 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	5,100.00	LF	1.46	7,446	
		Labor	87	L	19.45	1,692	9,138
6 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	510.00	EA	6.36	3,244	
		Labor	51	L	19.45	992	4,236
	DEEP EXCAVATIONS - ALLOWANCE						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	1,000.00	LF	1.46	1,460	
		Labor	17	L	19.45	331	1,791
8 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	100.00	EA	6.36	636	
		Labor	10	L	19.45	195	831
****	SUBTOTAL ****	Matl.				35,568	
		Labor	462			8,987	44,555
	INITIAL EROSION CONTROL INSTALLATION						
9 -A	SILT FENCE W/ WOOD STAKES	Matl.	1,900.00	LF	0.95	1,805	
		Labor	32	L	19.45	622	2,427
10 -A	CAT 446 BACKHOE	Matl.	16.00	HRS	18.85	302	
		Labor	16	EQ	22.06	353	655
11 -A	5 TON FLATBED TRUCK	Matl.	16.00	HRS	40.00	640	
		Labor	16	TD	20.78	332	972
12 -A	FOREMAN W/ PICKUP TRUCK	Matl.	16.00	HRS	10.00	160	
		Labor	16	FO	30.00	480	640
13 -A	SEEDING	Matl.	26.00	ACRE	1,500.00	39,000	
		Labor	0		0.00	0	39,000
	MAINTAIN EROSION CONTROL DURING CONSTRUCTION 1 WEEK PER MONTH @ 16 HRS/WK						
14 -A	5 TON FLATBED TRUCK	Matl.	10.00	MTH	640.00	6,400	
		Labor	160	TD	20.78	3,325	9,725
15 -A	CAT 446 BACKHOE	Matl.	10.00	MTH	301.60	3,016	
		Labor	160	EQ	22.06	3,530	6,546
16 -A	LABORERS	Matl.	10.00	MTH	0.00	0	
		Labor	320	L	19.45	6,224	6,224
17 -A	FOREMAN W/ PICKUP TRUCK	Matl.	10.00	MTH	160.00	1,600	
		Labor	160	FO	30.00	4,800	6,400

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
18 -A	SILT FENCE W/ WOOD STAKES ASSUME	Matl.	475.00	LF	0.95	451	
	REPLACING 25% OF EXISTING SILT FENCE	Labor	8	L	19.45	156	607
							-
****	SUBTOTAL ****	Matl.				53,374	
		Labor	888			19,822	73,196
	CONSTRUCT MAIN HAUL ROADS						
	WIDTH: 24'						
	LENGTH: 250'						
	DEPTH: 1'						
	EARTHWORK PREPARATION ASSUME 12" DEEP						
	QTY.: 225 CY						
	PRODUCTION RATE: 120 FCY/ HR						
19 -A	D-8 DOZER	Matl.	2.00	HRS	105.19	210	
		Labor	2	EQ	22.06	44	254
20 -A	CAT 16H MOTOR GRADER	Matl.	2.00	HRS	110.25	221	
		Labor	2	EQ	22.06	44	265
21 -A	COMPACTOR 825C	Matl.	2.00	HRS	123.61	247	
		Labor	2	EQ	22.06	44	291
22 -A	CAT CS-563 ROLLER	Matl.	2.00	HRS	39.75	80	
		Labor	2	EQ	22.06	44	124
23 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	2.00	HRS	37.14	74	
		Labor	1	EQ	22.06	22	96
24 -A	SPOTTER (2 EACH)	Matl.	2.00	HRS	0.00	0	
		Labor	4	L	19.45	78	78
25 -A	FOREMAN W/ TRUCK	Matl.	2.00	HRS	10.00	20	
		Labor	2	FO	30.00	60	80
26 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	737.00	SY	1.50	1,106	
		Labor	5	L	19.45	97	1,203

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA. QTY.: 225 CY PRODUCTION RATE: 120 FCY/ HR						
27 -A	AGGREGATE BASE STONE	Matl.	383.00	TON	10.50	4,022	
		Labor	0		0.00	0	4,022
28 -A	D-8 DOZER	Matl.	2.00	HRS	105.19	210	
		Labor	2	EQ	22.06	44	254
29 -A	CAT 16H MOTOR GRADER	Matl.	2.00	HRS	110.25	221	
		Labor	2	EQ	22.06	44	265
30 -A	COMPACTOR 825C	Matl.	2.00	HRS	123.61	247	
		Labor	2	EQ	22.06	44	291
31 -A	CAT CS-563 ROLLER	Matl.	2.00	HRS	39.75	80	
		Labor	2	EQ	22.06	44	124
32 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	2.00	HRS	37.14	74	
		Labor	1	EQ	22.06	22	96
33 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	2.00	HRS	302.66	605	
		Labor	6	EQ	22.06	132	737
34 -A	SPOTTER (2 EACH)	Matl.	2.00	HRS	0.00	0	
		Labor	4	L	19.45	78	78
35 -A	FOREMAN W/ TRUCK	Matl.	2.00	HRS	10.00	20	
		Labor	2	FO	30.00	60	80
	MAINTAIN HAUL ROADS (ASSUME 1 WEEK PER MONTH)						
36 -A	CAT 16H MOTOR GRADER	Matl.	10.00	MTH	4,410.00	44,100	
		Labor	400	EQ	22.06	8,824	52,924

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
37 -A	CAT CS-563 ROLLER	Matl.	10.00	MTH	1,590.00	15,900	
		Labor	400	EQ	22.06	8,824	24,724
38 -A	DUMP TRUCK	Matl.	10.00	MTH	1,600.00	16,000	
		Labor	400	TD	20.78	8,312	24,312
39 -A	SPOTTER (2 EACH)	Matl.	10.00	MTH	0.00	0	
		Labor	800	L	19.45	15,560	15,560
40 -A	FOREMAN W/ TRUCK	Matl.	10.00	MTH	400.00	4,000	
		Labor	400	FO	30.00	12,000	16,000
	CONSTRUCT TEMPORARY HAUL ROADS AND LOADING AREAS AT CONTRACTORS DISCRETION WIDTH: 24' LENGTH: 4100' DEPTH: 1'						
	HAUL AND PLACE AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA. QTY.: 3645 CY PRODUCTION RATE: 160 FCY/ HR						
41 -A	AGGREGATE BASE STONE	Matl.	6,197.00	TON	10.50	65,069	
		Labor	0		0.00	0	65,069
42 -A	D-8 DOZER	Matl.	23.00	HRS	105.19	2,419	
		Labor	23	EQ	22.06	507	2,926
43 -A	CAT 16H MOTOR GRADER	Matl.	23.00	HRS	110.25	2,536	
		Labor	23	EQ	22.06	507	3,043
44 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	23.00	HRS	37.14	854	
		Labor	12	EQ	22.06	265	1,119
45 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	23.00	HRS	302.66	6,961	
		Labor	69	EQ	22.06	1,522	8,483

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
46 -A	SPOTTER (2 EACH)	Matl.	23.00	HRS	0.00	0	
		Labor	46	L	19.45	895	895
47 -A	FOREMAN W/ TRUCK	Matl.	23.00	HRS	10.00	230	
		Labor	23	FO	30.00	690	920
****	SUBTOTAL ****	Matl.				165,506	
		Labor	2,637			58,807	224,313
	ALLOWANCE FOR MAINTENANCE ROADS						
	CONSTRUCT MAINTENANCE ROADS AT COMPLETION OF GENERAL EXCAVATION WIDTH: 24'						
	LENGTH: 3500'						
	DEPTH: 1'						
	GRADE AND COMPACT SUBGRADE						
	AREA: 9334 SY						
	PRODUCTION RATE: 720 SY/HR						
48 -A	CAT 16H MOTOR GRADER	Matl.	13.00	HRS	110.25	1,433	
		Labor	13	EQ	22.06	287	1,720
49 -A	COMPACTOR 825C	Matl.	13.00	HRS	123.61	1,607	
		Labor	13	EQ	22.06	287	1,894
50 -A	CAT CS-563 ROLLER	Matl.	13.00	HRS	39.75	517	
		Labor	13	EQ	22.06	287	804
51 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	13.00	HRS	37.14	483	
		Labor	7	EQ	22.06	154	637
52 -A	SPOTTER (2 EACH)	Matl.	13.00	HRS	0.00	0	
		Labor	26	L	19.45	506	506
53 -A	FOREMAN W/ TRUCK	Matl.	13.00	HRS	10.00	130	
		Labor	13	FO	30.00	390	520

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
54 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	10,267.00	SY	1.50	15,401	
		Labor	72	L	19.45	1,400	16,801
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA. QTY.: 3112 CY PRODUCTION RATE: 120 FCY/ HR						
55 -A	AGGREGATE BASE STONE	Matl.	5,290.00	TON	10.50	55,545	
		Labor	0		0.00	0	55,545
56 -A	D-8 DOZER	Matl.	26.00	HRS	105.19	2,735	
		Labor	26	EQ	22.06	574	3,309
57 -A	CAT 16H MOTOR GRADER	Matl.	26.00	HRS	110.25	2,867	
		Labor	26	EQ	22.06	574	3,441
58 -A	COMPACTOR 825C	Matl.	26.00	HRS	123.61	3,214	
		Labor	26	EQ	22.06	574	3,788
59 -A	CAT CS-563 ROLLER	Matl.	26.00	HRS	39.75	1,034	
		Labor	26	EQ	22.06	574	1,608
60 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	26.00	HRS	37.14	966	
		Labor	13	EQ	22.06	287	1,253
61 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	26.00	HRS	302.66	7,869	
		Labor	78	EQ	22.06	1,721	9,590
62 -A	SPOTTER (2 EACH)	Matl.	26.00	HRS	0.00	0	
		Labor	52	L	19.45	1,011	1,011
63 -A	FOREMAN W/ TRUCK	Matl.	26.00	HRS	10.00	260	
		Labor	26	FO	30.00	780	1,040
****	SUBTOTAL ****	Matl.				94,061	
		Labor	430			9,406	103,467

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
64 -A	ALLOWANCE FOR DECON STATIONS FOR ACCESS TO CLEAN AREAS AFTER CERTIFICATION	Matl.	2.00	LOT	20,000.00	40,000	
		Labor	0		0.00	0	40,000
****	SUBTOTAL ****	Matl.				40,000	
		Labor	0			0	40,000
65 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	1,148	ZZ	21.97	25,216	25,216
66 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	177	ZZ	21.97	3,888	3,888

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	388,509	126,126	514,635
TOTAL	388,509	(hrs. 5,742) 126,126	514,635

WBS ..... 1.3.2.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.04 GENERAL REQUIREMENTS
Discipline ..... C CIVIL AND SITE
B/M Title ..... GENERAL REQUIREMENTS

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... J.SMITH
Trace Number C.5.4 0

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
1 -A	PORTABLE COOL DOWN TRAILER, SELF CONTAINED POWER AND COOLING (2 EACH)	Matl.	10.00	MTH	500.00	5,000	
		Labor	0		0.00	0	5,000
2 -A	GENERATOR FOR COOL DOWN TRAILERS (2 EACH)	Matl.	10.00	MTH	40.00	400	
		Labor	0		0.00	0	400
3 -A	PORTABLE OFFICE TRAILER	Matl.	10.00	MTH	600.00	6,000	
		Labor	0		0.00	0	6,000
4 -A	SAFETY ENGINEER FULL TIME	Matl.	10.00	MTH	0.00	0	
		Labor	2,170	SE	40.00	86,800	86,800
5 -A	FIELD ENGINEER FULL TIME (2 EACH)	Matl.	20.00	MTH	0.00	0	
		Labor	4,340	FE	40.00	173,600	173,600
6 -A	SUPERIENTENDENT FULL TIME	Matl.	10.00	MTH	0.00	0	
		Labor	2,170	SU	50.00	108,500	108,500
7 -A	SECRETARY	Matl.	10.00	MTH	0.00	0	
		Labor	1,730	S	12.00	20,760	20,760
8 -A	SCHEDULER	Matl.	10.00	MTH	0.00	0	
		Labor	2,170	SD	30.00	65,100	65,100
9 -A	ESTIMATOR	Matl.	10.00	MTH	0.00	0	
		Labor	1,730	ES	30.00	51,900	51,900
10 -A	HEALTH PHYSICS TECHNICIAN (2 EACH)	Matl.	20.00	MTH	0.00	0	
		Labor	4,340	HP	30.00	130,200	130,200
11 -A	PICKUP TRUCKS 4X4, 8 EACH	Matl.	10.00	MTH	4,800.00	48,000	
		Labor	0		0.00	0	48,000

000189

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
12 -A	PHONE	Matl.	10.00	MTH	300.00	3,000	
		Labor	0		0.00	0	3,000
13 -A	MISC. OFFICE EQUIPMENT	Matl.	1.00	LOT	25,000.00	25,000	
		Labor	0		0.00	0	25,000

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	87,400	636,860	724,260
TOTAL	87,400	(hrs. 18,650) 636,860	724,260

ACD - FORMER PLANT AREA

WBS ..... 1.3.2.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.05 MOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... MOBILIZATION

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.5 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	** PROJECT MOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDES DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	42.00	EA	4,000.00	168,000	
		Labor	0		0.00	0	168,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176
7 -A	FLAT BED TRUCK - 5 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176

009191

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	20.00	EA	0.00	0	
		Labor	40	EQ	22.06	882	882
9 -A	CAT 613C WATER WAGON	Matl.	8.00	EA	240.00	1,920	
		Labor	96	EQ	22.06	2,118	4,038
10 -A	CAT 988 FE LOADER	Matl.	8.00	EA	120.00	960	
		Labor	64	EQ	22.06	1,412	2,372
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	40.00	EA	1,000.00	40,000	
		Labor	0		0.00	0	40,000
12 -A	CAT D8 DOZER	Matl.	8.00	EA	120.00	960	
		Labor	32	EQ	22.06	706	1,666
13 -A	CAT 446 BACKHOE	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
14 -A	CAT 16H GRADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
15 -A	CAT 825C COMPACTOR	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
16 -A	CAT CS-563 ROLLER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	8.00	EA	30.00	240	
		Labor	8	EQ	22.06	176	416

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	216,160	11,205	227,365
TOTAL	216,160	(hrs. 508) 11,205	227,365

WBS ..... 1.3.2.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.06 DEMOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... DEMOBILIZATION

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.6 0

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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 3B						
	** PROJECT DEMOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	42.00	EA	4,000.00	168,000	
		Labor	0		0.00	0	168,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176
7 -A	FLAT BED TRUCK - 5 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	20.00	EA	0.00	0	
		Labor	40	EQ	22.06	882	882
9 -A	CAT 613C WATER WAGON	Matl.	8.00	EA	240.00	1,920	
		Labor	96	EQ	22.06	2,118	4,038
10 -A	CAT 988 FE LOADER	Matl.	8.00	EA	120.00	960	
		Labor	64	EQ	22.06	1,412	2,372
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	40.00	EA	1,000.00	40,000	
		Labor	0		0.00	0	40,000
12 -A	CAT D8 DOZER	Matl.	8.00	EA	120.00	960	
		Labor	32	EQ	22.06	706	1,666
13 -A	CAT 446 BACKHOE	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
14 -A	CAT 16H GRADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
15 -A	CAT 825C COMPACTOR	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
16 -A	CAT CS-563 ROLLER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	8.00	EA	30.00	240	
		Labor	8	EQ	22.06	176	416
	DECONTAMINATION OF EQUIPMENT BEFORE TRANSPORT OFF-SITE						
20 -A	DECON THROUGH FREE RELEASE WASH STATION	Matl.	190.00	PCS	100.00	19,000	
		Labor	2,280	L	19.45	44,346	63,346

2250

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	235,160	55,551	290,711
TOTAL	235,160	(hrs. 2,788) 55,551	290,711

WBS ..... 1.3.3.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.03 CONCRETE FOUNDATIONS
Discipline ..... C CIVIL AND SITE
B/M Title ..... CONCRETE FOUNDATIONS

Cross-Cut Code ....
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Building/Area 4A
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.3 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	DEMOLISH, SIZE REDUCE, LOAD AND HAUL CONCRETE						
	QTY.: 40438 BCY						
	PRODUCTION RATE: 48 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 7000 LF						
1 -A	CAT 345 TRACHOE W/ GRAPPLE(4 EACH)	Matl.	843.00	HRS	359.52	303,075	
		Labor	3,372	EQ	22.06	74,386	377,461
2 -A	CAT 345 TRACHOE W/ HOE RAM (4 EACH)	Matl.	843.00	HRS	400.00	337,200	
		Labor	3,372	EQ	22.06	74,386	411,586
3 -A	CAT 345 TRACHOE W/ SHEARS (4 EACH)	Matl.	843.00	HRS	521.28	439,439	
		Labor	3,372	EQ	22.06	74,386	513,825
4 -A	CAT 345 TRACHOE W/ JAW CRUSHERS (2 EACH)	Matl.	843.00	HRS	221.74	186,927	
		Labor	1,686	EQ	22.06	37,193	224,120
5 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	843.00	HRS	201.77	170,092	
		Labor	1,686	EQ	22.06	37,193	207,285
6 -A	SPOTTERS (4 EACH)	Matl.	843.00	HRS	0.00	0	
		Labor	3,372	DE	19.61	66,125	66,125
7 -A	OILERS (ASSUME 1 PER 4 PIECES HVY EQUIP.)	Matl.	843.00	HRS	0.00	0	
		Labor	3,372	EQ	22.06	74,386	74,386
8 -A	ACETYLENE TORCH SETUP (4 EACH)	Matl.	843.00	HRS	40.00	33,720	
		Labor	3,372	BL	20.50	69,126	102,846

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	843.00	HRS	74.27	62,610	
		Labor	843	EQ	22.06	18,597	81,207
10 -A	4000 GAL WATER TRUCK W/ HOSE AND	Matl.	843.00	HRS	99.70	84,047	
	WATER CANNON SPRAYER (4 EACH)	Labor	3,372	TD	20.78	70,070	154,117
11 -A	FOREMAN W/ TRUCK (2 EACH)	Matl.	843.00	HRS	20.00	16,860	
		Labor	1,686	FO	30.00	50,580	67,440
****	SUBTOTAL ****	Matl.				1,633,970	
		Labor	29,505			646,428	2,280,398
	BLASTING CREW (AT 50% OF DEMO HOURS)						
12 -A	INGERSOLL-RAND ECM 350/ VL671 AIR	Matl.	422.00	HRS	22.09	9,322	
	DRIVEN TRACK DRILL	Labor	422	EQ	22.06	9,309	18,631
13 -A	AIR COMPRESSOR, ROTARY SCREW, 260 HP,	Matl.	422.00	HRS	24.96	10,533	
	900 CFM	Labor	0		0.00	0	10,533
14 -A	LOADING CREW	Matl.	422.00	HRS	0.00	0	
		Labor	844	DE	19.61	16,551	16,551
15 -A	BLASTING SUPERVISOR	Matl.	422.00	HRS	0.00	0	
		Labor	422	FO	30.00	12,660	12,660
16 -A	BLASTING MATERIALS	Matl.	422.00	HRS	100.00	42,200	
		Labor	0		0.00	0	42,200
****	SUBTOTAL ****	Matl.				62,055	
		Labor	1,688			38,520	100,575
17 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	8,110	ZZ	21.96	178,083	178,083
18 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	1,248	ZZ	21.96	27,404	27,404

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	1,696,025	890,435	2,586,460
TOTAL	1,696,025	(hrs. 40,551) 890,435	2,586,460

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ACD - FORMER PLANT AREA

WBS ..... 1.3.3.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.08 ASPHALT REMOVAL
Discipline ..... C CIVIL AND SITE
B/M Title ..... ASPHALT REMOVAL

Building/Area 4A
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.8 0

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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	BREAKUP, LOAD AND HAUL ASPHALT PARKING SURFACE QTY.: 2156 BCY						
	PRODUCTION RATE: 105 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 7000 LF						
1 -A	CAT 345 TRACHOE	Matl.	21.00	HRS	76.97	1,616	
		Labor	21	EQ	22.06	463	2,079
2 -A	CAT D-8 DOZER	Matl.	21.00	HRS	105.19	2,209	
		Labor	21	EQ	22.06	463	2,672
3 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	21.00	HRS	201.77	4,237	
		Labor	42	EQ	22.06	927	5,164
4 -A	SPOTTERS (2 EACH)	Matl.	21.00	HRS	0.00	0	
		Labor	42	DE	19.61	824	824
5 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	21.00	HRS	74.27	1,560	
		Labor	21	EQ	22.06	463	2,023
6 -A	FOREMAN W/ TRUCK	Matl.	21.00	HRS	10.00	210	
		Labor	21	FO	30.00	630	840
****	SUBTOTAL ****	Matl.				9,832	
		Labor	168			3,770	13,602

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	44	ZZ	22.44	987	987
8 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	7	ZZ	22.44	157	157

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	9,832	4,914	14,746
TOTAL	9,832	(hrs. 219) 4,914	14,746

WBS ..... 1.3.3.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.03 SOIL EXCAV ABV-WAC
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAV ABV-WAC

Cross-Cut Code ....
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Building/Area 4A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.3 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	MATERIAL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO AREA 7 QTY.:7225 BCY						
	PRODUCTION RATE: 218 BCY/ HR						
	HAUL DISTANCE TO AREA 7(ROUND TRIP): 5000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	34.00	HRS	76.97	2,617	
		Labor	34	EQ	22.06	750	3,367
2 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	34.00	HRS	201.77	6,860	
		Labor	68	EQ	22.06	1,500	8,360
3 -A	SPOTTERS (4 EACH)	Matl.	34.00	HRS	0.00	0	
		Labor	136	DE	19.61	2,667	2,667
4 -A	CAT D-8 DOZER	Matl.	34.00	HRS	105.19	3,576	
		Labor	34	EQ	22.06	750	4,326
5 -A	CAT 966 FE LOADER	Matl.	34.00	HRS	76.56	2,603	
		Labor	34	EQ	22.06	750	3,353
6 -A	DISC HARROW	Matl.	34.00	HRS	20.00	680	
		Labor	0		0.00	0	680
7 -A	OILER	Matl.	34.00	HRS	0.00	0	
		Labor	34	EQ	22.06	750	750
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	34.00	HRS	74.27	2,525	
		Labor	34	EQ	22.06	750	3,275

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	FOREMAN W/ TRUCK	Matl.	34.00	HRS	10.00	340	
		Labor	34	FO	30.00	1,020	1,360
****	SUBTOTAL ****	Matl.				19,201	
		Labor	408			8,937	28,138
10 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	139	ZZ	21.90	3,045	3,045
11 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	16	ZZ	21.90	350	350

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	19,201	12,332	31,533
TOTAL	19,201	(hrs. 563) 12,332	31,533

WBS ..... 1.3.3.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.11 SOIL EXCAVATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAVATION

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Building/Area 4A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.11 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	TOTAL QUANTITY OF SOIL: 150,404 BCY						
	GENERAL EXCAVATION: 150,355 BCY						
	IN-SITU TREATED RCRA SOIL: 0						
	CLAY PIPE: 49 BCY						
	ASSUME 30% OF THE SOIL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO THE OSDF QTY.: 45121 BCY						
	PRODUCTION RATE: 100 BCY/ HR						
	HAUL DISTANCE (ROUND TRIP): 7000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	452.00	HRS	76.97	34,790	
		Labor	452	EQ	22.06	9,971	44,761
2 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	452.00	HRS	403.54	182,400	
		Labor	1,808	EQ	22.06	39,884	222,284
	2 TRUCKS HAULING FROM EXCAVATION TO DEWATERING AREA						
	2 TRUCKS HAULING FROM DEWATERING AREA TO OSDF						
3 -A	SPOTTERS (4 EACH)	Matl.	452.00	HRS	0.00	0	
		Labor	1,808	DE	19.61	35,455	35,455

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
4 -A	CAT D-8 DOZER	Matl.	452.00	HRS	105.19	47,546	
		Labor	452	EQ	22.06	9,971	57,517
5 -A	CAT 966 FE LOADER	Matl.	452.00	HRS	76.56	34,605	
		Labor	452	EQ	22.06	9,971	44,576
6 -A	DISC HARROW	Matl.	452.00	HRS	20.00	9,040	
		Labor	0		0.00	0	9,040
7 -A	OILER	Matl.	452.00	HRS	0.00	0	
		Labor	452	EQ	22.06	9,971	9,971
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	452.00	HRS	74.27	33,570	
		Labor	452	EQ	22.06	9,971	43,541
9 -A	FOREMAN W/ TRUCK	Matl.	452.00	HRS	10.00	4,520	
		Labor	452	FO	30.00	13,560	18,080
****	SUBTOTAL ****	Matl.				346,471	
		Labor	6,328			138,754	485,225
	ASSUME THE REMAINING 70% OF SOIL WILL BE EXCAVATED, LOADED AND HAULED TO THE OSDF						
	QTY.: 105283 BCY						
	PRODUCTION RATE: 202 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 7000 LF						
10 -A	CAT 345 TRACHOE (2 EACH)	Matl.	522.00	HRS	153.94	80,357	
		Labor	1,044	EQ	22.06	23,031	103,388
11 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	522.00	HRS	403.54	210,648	
		Labor	2,088	EQ	22.06	46,061	256,709
12 -A	SPOTTERS (2 EACH)	Matl.	522.00	HRS	0.00	0	
		Labor	1,044	DE	19.61	20,473	20,473

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
13 -A	OILER	Matl.	522.00	HRS	0.00	0	
		Labor	522	EQ	22.06	11,515	11,515
14 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	522.00	HRS	74.27	38,769	
		Labor	522	EQ	22.06	11,515	50,284
15 -A	FOREMAN W/ TRUCK	Matl.	522.00	HRS	10.00	5,220	
		Labor	522	FO	30.00	15,660	20,880
****	SUBTOTAL ****	Matl.				334,994	
		Labor	5,742			128,255	463,249
16 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	3,138	ZZ	22.12	69,418	69,418
17 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	483	ZZ	22.12	10,685	10,685

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	681,465	347,112	1,028,577
TOTAL	681,465	(hrs. 15,691) 347,112	1,028,577

WBS ..... 1.3.3.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.16 BACKFILL
Discipline ..... C CIVIL AND SITE
B/M Title ..... BACKFILL

Building/Area 4A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.16 0

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Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	BACKFILL IN GENERAL EXCAVATION AREAS TO BACKFILL THE GMA 5' ENCROACMENTS QTY.: 15,840 FCY						
	PRODUCTION RATE: 112 FCY						
	ASSUME BORROW AREA ROUND TRIP HAUL DISTANCE: 12000' LOW PRODUCTION RATE DUE TO VARYING SIZE OF PLACEMENT AREAS						
	BORROW AREA INCLUDING HAUL						
1 -A	CAT D-8 DOZER	Matl.	142.00	HRS	105.19	14,937	
		Labor	142	EQ	22.06	3,133	18,070
2 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	142.00	HRS	76.97	10,930	
		Labor	142	EQ	22.06	3,133	14,063
3 -A	CAT D400 ARTICULATED DUMP TRUCKS (4 EACH)	Matl.	142.00	HRS	403.60	57,311	
		Labor	568	EQ	22.06	12,530	69,841
4 -A	SPOTTER	Matl.	142.00	HRS	0.00	0	
		Labor	142	L	19.45	2,762	2,762
5 -A	FOREMAN W/ TRUCK	Matl.	142.00	HRS	10.00	1,420	
		Labor	142	FO	30.00	4,260	5,680
	PLACEMENT						
6 -A	CAT D-6 DOZER	Matl.	142.00	HRS	57.93	8,226	
		Labor	142	EQ	22.06	3,133	11,359
7 -A	CAT D-8 DOZER	Matl.	142.00	HRS	105.19	14,937	
		Labor	142	EQ	22.06	3,133	18,070

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	CAT 825C COMPACTOR	Matl.	142.00	HRS	123.61	17,553	
		Labor	142	EQ	22.06	3,133	20,686
9 -A	CAT CS-563 ROLLER	Matl.	142.00	HRS	39.75	5,645	
		Labor	142	EQ	22.06	3,133	8,778
10 -A	SPOTTER	Matl.	142.00	HRS	0.00	0	
		Labor	142	L	19.45	2,762	2,762
****	SUBTOTAL ****	Matl.				130,959	
		Labor	1,846			41,112	172,071
	BACKFILL DIVERSION DIKES						
	QTY.: 25 FCY						
	PRODUCTION RATE: 56 FCY/HR						
	SMALL QUANTITY ASSUME 1 DAYS FOR THIS DIKE						
	ASSUME BORROW AREA ROUND TRIP HAUL DISTANCE: 12000'						
	LOW PRODUCTION RATE DUE TO SMALL CROSS SECTIONAL AREA OF DIKE						
	BORROW AREA INCLUDING HAUL						
11 -A	CAT D-8 DOZER	Matl.	10.00	HRS	105.19	1,052	
		Labor	10	EQ	22.06	221	1,273
12 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	10.00	HRS	76.97	770	
		Labor	10	EQ	22.06	221	991
13 -A	CAT D400 ARTICULATED DUMP TRUCKS (2 EACH)	Matl.	10.00	HRS	201.80	2,018	
		Labor	20	EQ	22.06	441	2,459
14 -A	SPOTTER	Matl.	10.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
15 -A	FOREMAN W/ TRUCK	Matl.	10.00	HRS	10.00	100	
		Labor	10	FO	30.00	300	400
	PLACEMENT						
16 -A	CAT D-6 DOZER	Matl.	10.00	HRS	57.93	579	
		Labor	10	EQ	22.06	221	800

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
17 -A	CAT CP-323 COMPACTOR	Matl.	10.00	HRS	48.63	486	
		Labor	10	EQ	22.06	221	707
18 -A	CAT CS-563 ROLLER (SEAL SURFACE ONLY)	Matl.	10.00	HRS	39.75	398	
		Labor	0		0.00	0	398
19 -A	SPOTTER	Matl.	10.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
20 -A	GRADE CHECKER	Matl.	10.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
****	SUBTOTAL ****	Matl.				5,403	
		Labor	100			2,210	7,613
21 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	506	ZZ	22.26	11,265	11,265
22 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	78	ZZ	22.26	1,736	1,736

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	136,362	56,323	192,685
TOTAL	136,362	(hrs. 2,530) 56,323	192,685

ACD - FORMER PLANT AREA

WBS ..... 1.3.3.3 GROUNDWATER CNTRL
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C3.03 GROUNDWATER CONTROL
Discipline ..... C CIVIL AND SITE
B/M Title ..... GROUNDWATER CONTROL

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GW CONTROL
Quantity Take-Off By ... CIVIL
Trace Number C.3.3 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	GAS POWERED TRASH TYPE SUMP PUMPS						
1 -A	WACKER 4" DIA TRASH PUMP, 625 GPM @ 87' HD, 12 HP	Matl.	7.00	EA	7,240.00	50,680	
		Labor	0		0.00	0	50,680
2 -A	4" SUCTION HOSE, 200 PSI, ASSUME 100' PER PUMP ALLOWANCE FOR ABOVEGROUND PIPE - DRISCO	Matl.	700.00	LF	14.07	9,849	
		Labor	0		0.00	0	9,849
3 -A	ASSUME 4" AVERAGE SIZE	Matl.	5,000.00	LF	1.50	7,500	
		Labor	320	L	19.45	6,224	13,724
4 -A	CONNECTIONS TO EXISTING STORM DRAIN	Matl.	2.00	EA	250.00	500	
		Labor	16	L	19.45	311	811
	OPERATE PUMPS (ASSUME 4 HRS PER DAY)						
5 -A	OPERATOR	Matl.	16.00	MTH	100.00	1,600	
		Labor	1,392	EQ	22.06	30,708	32,308
6 -A	FLATBED TRUCK, 2-1/2 TON	Matl.	16.00	MTH	1,300.00	20,800	
		Labor	1,392	TD	20.78	28,926	49,726
	CONSTRUCT SEDIMENT PONDS						
	EXCAVATION IS COVERED BY GENERAL EXCAVATION QTY.: 1 EACH						
	ANCHOR TRENCH AT TOP OF SLOPE TO SECURE LINER						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	LENGTH: 600'						
	QTY.:45 CY						
	PRODUCTION: 10 CY/HR						
7 -A	CAT 446 BACKHOE	Matl.	5.00	HRS	18.85	94	
		Labor	5	EQ	22.06	110	204
8 -A	LABORERS (2 EACH)	Matl.	5.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
9 -A	FOREMAN W/ TRUCK	Matl.	5.00	HRS	10.00	50	
		Labor	5	FO	30.00	150	200
10 -A	INSTALL 40 MIL HDPE LINER, COST	Matl.	3,151.00	SY	4.50	14,180	
	INCLUDES INSTALLATION	Labor	0		0.00	0	14,180
11 -A	SAND BAGS - ALLOWANCE	Matl.	1.00	LOT	250.00	250	
		Labor	0		0.00	0	250
12 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	816	ZZ	21.22	17,314	17,314
13 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	126	ZZ	21.22	2,673	2,673

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	105,503	86,611	192,114
TOTAL	105,503	(hrs. 4,082) 86,611	192,114

WBS ..... 1.3.3.4 SITE PREPARATION
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C4.03 SITE PREP,ROADS,FENCING
Discipline ..... C CIVIL AND SITE
B/M Title ..... SITE PREP,ROADS,FENCING

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SITE PREP
Quantity Take-Off By ... JLS
Trace Number C.4.3 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	BOUNDARY FENCING						
	OUTER PERIMETER (INCLUDING MAIN HAUL ROADS)						
1 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	3,400.00	LF	1.46	4,964	
		Labor	58	L	19.45	1,128	6,092
2 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	340.00	EA	6.36	2,162	
		Labor	34	L	19.45	661	2,823
	ABV-WAC AREAS						
3 -A	YELLOW AND MAGENTA STRIPED SAFETY BOUNDARY TAPE	Matl.	1,400.00	LF	0.17	238	
		Labor	1	L	19.45	19	257
4 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	140.00	EA	6.36	890	
		Labor	14	L	19.45	272	1,162
	SHUTTLE ACCESS CORRIDOR						
	THIS WILL BE CONSTRUCTED UNDER AREA 3A						
	DEEP EXCAVATIONS - ALLOWANCE						
5 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	1,000.00	LF	1.46	1,460	
		Labor	17	L	19.45	331	1,791
6 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	100.00	EA	6.36	636	
		Labor	10	L	19.45	195	831

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
****	SUBTOTAL ****	Matl.				10,350	
		Labor	134			2,606	12,956
	INITIAL EROSION CONTROL INSTALLATION						
7 -A	SILT FENCE W/ WOOD STAKES	Matl.	2,000.00	LF	0.95	1,900	
		Labor	34	L	19.45	661	2,561
8 -A	CAT 446 BACKHOE	Matl.	17.00	HRS	18.85	320	
		Labor	17	EQ	22.06	375	695
9 -A	5 TON FLATBED TRUCK	Matl.	17.00	HRS	40.00	680	
		Labor	17	TD	20.78	353	1,033
10 -A	FOREMAN W/ PICKUP TRUCK	Matl.	17.00	HRS	10.00	170	
		Labor	17	FO	30.00	510	680
11 -A	SEEDING	Matl.	23.00	ACRE	1,500.00	34,500	
		Labor	0		0.00	0	34,500
	MAINTAIN EROSION CONTROL DURING CONSTRUCTION 1 WEEK PER MONTH @ 16 HRS/WK						
12 -A	5 TON FLATBED TRUCK	Matl.	16.00	MTH	640.00	10,240	
		Labor	256	TD	20.78	5,320	15,560
13 -A	CAT 446 BACKHOE	Matl.	16.00	MTH	301.60	4,826	
		Labor	256	EQ	22.06	5,647	10,473
14 -A	LABORERS	Matl.	16.00	MTH	0.00	0	
		Labor	512	L	19.45	9,958	9,958
15 -A	FOREMAN W/ PICKUP TRUCK	Matl.	16.00	MTH	160.00	2,560	
		Labor	256	FO	30.00	7,680	10,240
16 -A	SILT FENCE W/ WOOD STAKES ASSUME REPLACING 25% OF EXISTING SILT FENCE	Matl.	500.00	LF	0.95	475	
		Labor	9	L	19.45	175	650
****	SUBTOTAL ****	Matl.				55,671	
		Labor	1,374			30,679	86,350

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	CONSTRUCT MAIN HAUL ROADS						
	WIDTH: 24'						
	LENGTH: 1500'						
	DEPTH: 1'						
	EARTHWORK PREPARATION ASSUME 12" DEEP						
	QTY.: 1335 CY						
	PRODUCTION RATE: 120 FCY/ HR						
17 -A	D-8 DOZER	Matl.	12.00	HRS	105.19	1,262	
		Labor	12	EQ	22.06	265	1,527
18 -A	CAT 16H MOTOR GRADER	Matl.	12.00	HRS	110.25	1,323	
		Labor	12	EQ	22.06	265	1,588
19 -A	COMPACTOR 825C	Matl.	12.00	HRS	123.61	1,483	
		Labor	12	EQ	22.06	265	1,748
20 -A	CAT CS-563 ROLLER	Matl.	12.00	HRS	39.75	477	
		Labor	12	EQ	22.06	265	742
21 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	12.00	HRS	37.14	446	
		Labor	6	EQ	22.06	132	578
22 -A	SPOTTER (2 EACH)	Matl.	12.00	HRS	0.00	0	
		Labor	24	L	19.45	467	467
23 -A	FOREMAN W/ TRUCK	Matl.	12.00	HRS	10.00	120	
		Labor	12	FO	30.00	360	480
24 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	4,400.00	SY	1.50	6,600	
		Labor	31	L	19.45	603	7,203
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 1335 CY						
	PRODUCTION RATE: 120 FCY/ HR						
25 -A	AGGREGATE BASE STONE	Matl.	2,270.00	TON	10.50	23,835	
		Labor	0		0.00	0	23,835
26 -A	D-8 DOZER	Matl.	12.00	HRS	105.19	1,262	
		Labor	12	EQ	22.06	265	1,527
27 -A	CAT 16H MOTOR GRADER	Matl.	12.00	HRS	110.25	1,323	
		Labor	12	EQ	22.06	265	1,588
28 -A	COMPACTOR 825C	Matl.	12.00	HRS	123.61	1,483	
		Labor	12	EQ	22.06	265	1,748
29 -A	CAT CS-563 ROLLER	Matl.	12.00	HRS	39.75	477	
		Labor	12	EQ	22.06	265	742
30 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	12.00	HRS	37.14	446	
		Labor	6	EQ	22.06	132	578
31 -A	CAT D400 ARTICULATED DUMP TRUCKS (3	Matl.	12.00	HRS	302.66	3,632	
	EACH)	Labor	36	EQ	22.06	794	4,426
32 -A	SPOTTER (2 EACH)	Matl.	12.00	HRS	0.00	0	
		Labor	24	L	19.45	467	467
33 -A	FOREMAN W/ TRUCK	Matl.	12.00	HRS	10.00	120	
		Labor	12	FO	30.00	360	480
	MAINTAIN HAUL ROADS (ASSUME 1 WEEK PER MONTH)						
34 -A	CAT 16H MOTOR GRADER	Matl.	16.00	MTH	4,410.00	70,560	
		Labor	640	EQ	22.06	14,118	84,678
35 -A	CAT CS-563 ROLLER	Matl.	16.00	MTH	1,590.00	25,440	
		Labor	640	EQ	22.06	14,118	39,558
36 -A	DUMP TRUCK	Matl.	16.00	MTH	1,600.00	25,600	
		Labor	640	TD	20.78	13,299	38,899

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
37 -A	SPOTTER (2 EACH)	Matl.	16.00	MTH	0.00	0	
		Labor	1,280	L	19.45	24,896	24,896
38 -A	FOREMAN W/ TRUCK	Matl.	16.00	MTH	400.00	6,400	
		Labor	640	FO	30.00	19,200	25,600
	CONSTRUCT TEMPORARY HAUL ROADS AND LOADING AREAS AT CONTRACTORS DISCRETION						
	WIDTH: 24'						
	LENGTH: 3000'						
	DEPTH: 1'						
	HAUL AND PLACE AGGREGATE BASE STONE						
	AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 2667 CY						
	PRODUCTION RATE: 160 FCY/ HR						
39 -A	AGGREGATE BASE STONE	Matl.	4,534.00	TON	10.50	47,607	
		Labor	0		0.00	0	47,607
40 -A	D-8 DOZER	Matl.	17.00	HRS	105.19	1,788	
		Labor	17	EQ	22.06	375	2,163
41 -A	CAT 16H MOTOR GRADER	Matl.	17.00	HRS	110.25	1,874	
		Labor	17	EQ	22.06	375	2,249
42 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	17.00	HRS	37.14	631	
		Labor	9	EQ	22.06	199	830
43 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	17.00	HRS	302.66	5,145	
		Labor	51	EQ	22.06	1,125	6,270
44 -A	SPOTTER (2 EACH)	Matl.	17.00	HRS	0.00	0	
		Labor	34	L	19.45	661	661
45 -A	FOREMAN W/ TRUCK	Matl.	17.00	HRS	10.00	170	
		Labor	17	FO	30.00	510	680

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
****	SUBTOTAL ****	Matl.				229,504	
		Labor	4,232			94,311	323,815
	ALLOWANCE FOR MAINTENANCE ROADS						
	CONSTRUCT MAINTENANCE ROADS AT COMPLETION OF GENERAL EXCAVATION WIDTH: 24'						
	LENGTH: 4250'						
	DEPTH: 1'						
	GRADE AND COMPACT SUBGRADE						
	AREA: 11334 SY						
	PRODUCTION RATE: 720 SY/HR						
46 -A	CAT 16H MOTOR GRADER	Matl.	16.00	HRS	110.25	1,764	
		Labor	16	EQ	22.06	353	2,117
47 -A	COMPACTOR 825C	Matl.	16.00	HRS	123.61	1,978	
		Labor	16	EQ	22.06	353	2,331
48 -A	CAT CS-563 ROLLER	Matl.	16.00	HRS	39.75	636	
		Labor	16	EQ	22.06	353	989
49 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	16.00	HRS	37.14	594	
		Labor	8	EQ	22.06	176	770
50 -A	SPOTTER (2 EACH)	Matl.	16.00	HRS	0.00	0	
		Labor	32	L	19.45	622	622
51 -A	FOREMAN W/ TRUCK	Matl.	16.00	HRS	10.00	160	
		Labor	16	FO	30.00	480	640
52 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	12,468.00	SY	1.50	18,702	
		Labor	87	L	19.45	1,692	20,394

000217

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA. QTY.: 3778 CY PRODUCTION RATE: 120 FCY/ HR						
53 -A	AGGREGATE BASE STONE	Matl.	6,423.00	TON	10.50	67,442	
		Labor	0		0.00	0	67,442
54 -A	D-8 DOZER	Matl.	32.00	HRS	105.19	3,366	
		Labor	32	EQ	22.06	706	4,072
55 -A	CAT 16H MOTOR GRADER	Matl.	32.00	HRS	110.25	3,528	
		Labor	32	EQ	22.06	706	4,234
56 -A	COMPACTOR 825C	Matl.	32.00	HRS	123.61	3,956	
		Labor	32	EQ	22.06	706	4,662
57 -A	CAT CS-563 ROLLER	Matl.	32.00	HRS	39.75	1,272	
		Labor	32	EQ	22.06	706	1,978
58 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	32.00	HRS	37.14	1,188	
		Labor	16	EQ	22.06	353	1,541
59 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	32.00	HRS	302.66	9,685	
		Labor	96	EQ	22.06	2,118	11,803
60 -A	SPOTTER (2 EACH)	Matl.	32.00	HRS	0.00	0	
		Labor	64	L	19.45	1,245	1,245
61 -A	FOREMAN W/ TRUCK	Matl.	32.00	HRS	10.00	320	
		Labor	32	FO	30.00	960	1,280
****	SUBTOTAL ****	Matl.				114,591	
		Labor	527			11,529	126,120
62 -A	ALLOWANCE FOR DECON STATIONS FOR ACCESS TO CLEAN AREAS AFTER CERTIFICATION	Matl.	2.00	LOT	20,000.00	40,000	
		Labor	0		0.00	0	40,000
****	SUBTOTAL ****	Matl.				40,000	
		Labor	0			0	40,000

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
63 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	1,629	ZZ	22.20	36,163	36,163
64 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	251	ZZ	22.20	5,572	5,572

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	450,116	180,860	630,976
TOTAL	450,116	(hrs. 8,147) 180,860	630,976

ACD - FORMER PLANT AREA

WBS ..... 1.3.3.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.07 GENERAL REQUIREMENTS
Discipline ..... C CIVIL AND SITE
B/M Title ..... GENERAL REQUIREMENTS

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... J.SMITH
Trace Number C.5.7 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
1 -A	PORTABLE COOL DOWN TRAILER, SELF CONTAINED POWER AND COOLING (2 EACH)	Matl.	16.00	MTH	500.00	8,000	
		Labor	0		0.00	0	8,000
2 -A	GENERATOR FOR COOL DOWN TRAILERS (2 EACH)	Matl.	16.00	MTH	40.00	640	
		Labor	0		0.00	0	640
3 -A	PORTABLE OFFICE TRAILER	Matl.	16.00	MTH	600.00	9,600	
		Labor	0		0.00	0	9,600
4 -A	SAFETY ENGINEER FULL TIME	Matl.	16.00	MTH	0.00	0	
		Labor	3,472	SE	40.00	138,880	138,880
5 -A	FIELD ENGINEER FULL TIME (2 EACH)	Matl.	32.00	MTH	0.00	0	
		Labor	6,944	FE	40.00	277,760	277,760
6 -A	SUPERIENTENDENT FULL TIME	Matl.	16.00	MTH	0.00	0	
		Labor	3,472	SU	50.00	173,600	173,600
7 -A	SECRETARY	Matl.	16.00	MTH	0.00	0	
		Labor	2,768	S	12.00	33,216	33,216
8 -A	SCHEDULER	Matl.	16.00	MTH	0.00	0	
		Labor	3,472	SD	30.00	104,160	104,160
9 -A	ESTIMATOR	Matl.	16.00	MTH	0.00	0	
		Labor	2,768	ES	30.00	83,040	83,040
10 -A	HEALTH PHYSICS TECHNICIAN (2 EACH)	Matl.	32.00	MTH	0.00	0	
		Labor	6,944	HP	30.00	208,320	208,320
11 -A	PICKUP TRUCKS 4X4, 8 EACH	Matl.	16.00	MTH	4,800.00	76,800	
		Labor	0		0.00	0	76,800

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
12 -A	PHONE	Matl.	16.00	MTH	300.00	4,800	
		Labor	0		0.00	0	4,800
13 -A	MISC. OFFICE EQUIPMENT	Matl.	1.00	LOT	25,000.00	25,000	
		Labor	0		0.00	0	25,000

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	124,840	1,018,976	1,143,816
TOTAL	124,840	(hrs. 29,840) 1,018,976	1,143,816

000221

2250

WBS ..... 1.3.3.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.08 MOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... MOBILIZATION

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.8 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	** PROJECT MOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	42.00	EA	4,000.00	168,000	
		Labor	0		0.00	0	168,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176
7 -A	FLAT BED TRUCK - 5 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176

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Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	20.00	EA	0.00	0	
		Labor	40	EQ	22.06	882	882
9 -A	CAT 613C WATER WAGON	Matl.	8.00	EA	240.00	1,920	
		Labor	96	EQ	22.06	2,118	4,038
10 -A	CAT 988 FE LOADER	Matl.	8.00	EA	120.00	960	
		Labor	64	EQ	22.06	1,412	2,372
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	40.00	EA	1,000.00	40,000	
		Labor	0		0.00	0	40,000
12 -A	CAT D8 DOZER	Matl.	8.00	EA	120.00	960	
		Labor	32	EQ	22.06	706	1,666
13 -A	CAT 446 BACKHOE	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
14 -A	CAT 16H GRADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
15 -A	CAT 825C COMPACTOR	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
16 -A	CAT CS-563 ROLLER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	8.00	EA	30.00	240	
		Labor	8	EQ	22.06	176	416

000223

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	216,160	11,205	227,365
TOTAL	216,160	(hrs. 508) 11,205	227,365

ACD - FORMER PLANT AREA

WBS ..... 1.3.3.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.09 DEMOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... DEMOBILIZATION

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.9 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4A						
	** PROJECT DEMOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	42.00	EA	4,000.00	168,000	
		Labor	0		0.00	0	168,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176
7 -A	FLAT BED TRUCK - 5 TON	Matl.	4.00	EA	0.00	0	
		Labor	8	EQ	22.06	176	176

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	20.00	EA	0.00	0	
		Labor	40	EQ	22.06	882	882
9 -A	CAT 613C WATER WAGON	Matl.	8.00	EA	240.00	1,920	
		Labor	96	EQ	22.06	2,118	4,038
10 -A	CAT 988 FE LOADER	Matl.	8.00	EA	120.00	960	
		Labor	64	EQ	22.06	1,412	2,372
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	40.00	EA	1,000.00	40,000	
		Labor	0		0.00	0	40,000
12 -A	CAT D8 DOZER	Matl.	8.00	EA	120.00	960	
		Labor	32	EQ	22.06	706	1,666
13 -A	CAT 446 BACKHOE	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
14 -A	CAT 16H GRADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
15 -A	CAT 825C COMPACTOR	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
16 -A	CAT CS-563 ROLLER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	8.00	EA	30.00	240	
		Labor	8	EQ	22.06	176	416
	DECONTAMINATION OF EQUIPMENT BEFORE TRANSPORT OFF-SITE						
20 -A	DECON THROUGH FREE RELEASE WASH STATION	Matl.	190.00	PCS	100.00	19,000	
		Labor	2,280	L	19.45	44,346	63,346

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	235,160	55,551	290,711
TOTAL	235,160	(hrs. 2,788) 55,551	290,711

000227

WBS ..... 1.3.4.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.04 CONCRETE FOUNDATIONS
Discipline ..... C CIVIL AND SITE
B/M Title ..... CONCRETE FOUNDATIONS

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.4 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	DEMOLISH, SIZE REDUCE, LOAD AND HAUL CONCRETE QTY.: 26511 BCY						
	PRODUCTION RATE: 48 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 10000 LF						
1 -A	CAT 345 TRACHOE W/ GRAPPLE(4 EACH)	Matl.	552.00	HRS	359.52	198,455	
		Labor	2,208	EQ	22.06	48,708	247,163
2 -A	CAT 345 TRACHOE W/ HOE RAM (4 EACH)	Matl.	552.00	HRS	400.00	220,800	
		Labor	2,208	EQ	22.06	48,708	269,508
3 -A	CAT 345 TRACHOE W/ SHEARS (4 EACH)	Matl.	552.00	HRS	521.28	287,747	
		Labor	2,208	EQ	22.06	48,708	336,455
4 -A	CAT 345 TRACHOE W/ JAW CRUSHERS (2 EACH)	Matl.	552.00	HRS	221.74	122,400	
		Labor	1,104	EQ	22.06	24,354	146,754
5 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	552.00	HRS	201.77	111,377	
		Labor	1,104	EQ	22.06	24,354	135,731
6 -A	SPOTTERS (4 EACH)	Matl.	552.00	HRS	0.00	0	
		Labor	2,208	DE	19.61	43,299	43,299
7 -A	OILERS (ASSUME 1 PER 4 PIECES HVY EQUIP.)	Matl.	552.00	HRS	0.00	0	
		Labor	2,208	EQ	22.06	48,708	48,708
8 -A	ACETYLENE TORCH SETUP (4 EACH)	Matl.	552.00	HRS	40.00	22,080	
		Labor	2,208	BL	20.50	45,264	67,344

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	552.00	HRS	74.27	40,997	
		Labor	552	EQ	22.06	12,177	53,174
10 -A	4000 GAL WATER TRUCK W/ HOSE AND WATER CANNON SPRAYER (4 EACH)	Matl.	552.00	HRS	99.70	55,034	
		Labor	2,208	TD	20.78	45,882	100,916
11 -A	FOREMAN W/ TRUCK (2 EACH)	Matl.	552.00	HRS	20.00	11,040	
		Labor	1,104	FO	30.00	33,120	44,160
****	SUBTOTAL ****	Matl.				1,069,930	
		Labor	19,320			423,282	1,493,212
	BLASTING CREW (AT 50% OF DEMO HOURS)						
12 -A	INGERSOLL-RAND ECM 350/ VL671 AIR DRIVEN TRACK DRILL	Matl.	276.00	HRS	22.09	6,097	
		Labor	276	EQ	22.06	6,089	12,186
13 -A	AIR COMPRESSOR, ROTARY SCREW, 260 HP, 900 CFM	Matl.	276.00	HRS	24.96	6,889	
		Labor	0		0.00	0	6,889
14 -A	LOADING CREW	Matl.	276.00	HRS	0.00	0	
		Labor	552	DE	19.61	10,825	10,825
15 -A	BLASTING SUPERVISOR	Matl.	276.00	HRS	0.00	0	
		Labor	276	FO	30.00	8,280	8,280
16 -A	BLASTING MATERIALS	Matl.	276.00	HRS	100.00	27,600	
		Labor	0		0.00	0	27,600
****	SUBTOTAL ****	Matl.				40,586	
		Labor	1,104			25,194	65,780
17 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	5,310	ZZ	21.96	116,598	116,598
18 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	817	ZZ	21.96	17,940	17,940

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	1,110,516	583,014	1,693,530
TOTAL	1,110,516	(hrs. 26,551) 583,014	1,693,530

WBS ..... 1.3.4.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.09 ASPHALT REMOVAL
Discipline ..... C CIVIL AND SITE
B/M Title ..... ASPHALT REMOVAL

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.9 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	BREAKUP, LOAD AND HAUL ASPHALT PARKING SURFACE QTY.: 2156 BCY						
	PRODUCTION RATE: 93 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 10000 LF						
1 -A	CAT 345 TRACHOE	Matl.	22.00	HRS	76.97	1,693	
		Labor	22	EQ	22.06	485	2,178
2 -A	CAT D-8 DOZER	Matl.	22.00	HRS	105.19	2,314	
		Labor	22	EQ	22.06	485	2,799
3 -A	CAT D400E ARTICULATED DUMP TRUCKS (2 EACH)	Matl.	22.00	HRS	201.77	4,439	
		Labor	44	EQ	22.06	971	5,410
4 -A	SPOTTERS (2 EACH)	Matl.	22.00	HRS	0.00	0	
		Labor	44	DE	19.61	863	863
5 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	22.00	HRS	74.27	1,634	
		Labor	22	EQ	22.06	485	2,119
6 -A	FOREMAN W/ TRUCK	Matl.	22.00	HRS	10.00	220	
		Labor	22	FO	30.00	660	880
****	SUBTOTAL ****	Matl.				10,300	
		Labor	176			3,949	14,249

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	46	ZZ	22.44	1,032	1,032
8 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	7	ZZ	22.44	157	157

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	10,300	5,138	15,438
TOTAL	10,300	(hrs. 229) 5,138	15,438

WBS ..... 1.3.4.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.04 SOIL EXCAV ABV-WAC
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAV ABV-WAC

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.4 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	MATERIAL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO AREA 7 QTY.:10000 BCY						
	PRODUCTION RATE: 218 BCY/ HR						
	HAUL DISTANCE TO AREA 7(ROUND TRIP): 5000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	46.00	HRS	76.97	3,541	
		Labor	46	EQ	22.06	1,015	4,556
2 -A	CAT D400E ARTICULATED DUMP TRUCK (2 EACH)	Matl.	46.00	HRS	201.77	9,281	
		Labor	92	EQ	22.06	2,030	11,311
3 -A	SPOTTERS (4 EACH)	Matl.	46.00	HRS	0.00	0	
		Labor	184	DE	19.61	3,608	3,608
4 -A	CAT D-8 DOZER	Matl.	46.00	HRS	105.19	4,839	
		Labor	46	EQ	22.06	1,015	5,854
5 -A	CAT 966 FE LOADER	Matl.	46.00	HRS	76.56	3,522	
		Labor	46	EQ	22.06	1,015	4,537
6 -A	DISC HARROW	Matl.	46.00	HRS	20.00	920	
		Labor	0		0.00	0	920
7 -A	OILER	Matl.	46.00	HRS	0.00	0	
		Labor	46	EQ	22.06	1,015	1,015
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	46.00	HRS	74.27	3,416	
		Labor	46	EQ	22.06	1,015	4,431

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
9 -A	FOREMAN W/ TRUCK	Matl.	46.00	HRS	10.00	460	
		Labor	46	FO	30.00	1,380	1,840
****	SUBTOTAL ****	Matl.				25,979	
		Labor	552			12,093	38,072
10 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	188	ZZ	21.91	4,119	4,119
11 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	22	ZZ	21.91	482	482

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	25,979	16,694	42,673
TOTAL	25,979	(hrs. 762) 16,694	42,673

WBS ..... 1.3.4.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.08 RCRA SOIL TREATMENT
Discipline ..... C CIVIL AND SITE
B/M Title ..... RCRA SOIL TREATMENT

Cross-Cut Code ....
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Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.8 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	ASSUMPTION: RCRA SOIL WILL BE TREATED IN-SITU, THEN EXCAVATED AND HAULED TO THE OSDF EXCAVATION AND HAUL COSTS ARE SHOWN WITH THE GENERAL EXCAVATION TASK. THE UNIT COST IS BASED ON MAECTITE INC. QTY: 225 CY						
1 -A	IN-SITU SOIL TREATMENT COST IS TOTAL UNIT PRICE	Matl.	274.00	TON	100.00	27,400	
		Labor	0		0.00	0	27,400

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	27,400	0	27,400
TOTAL	27,400	(hrs. 0) 0	27,400

WBS ..... 1.3.4.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.12 SOIL EXCAVATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAVATION

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.12 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	TOTAL QUANTITY OF SOIL: 744,702 BCY						
	GENERAL EXCAVATION: 744,702 BCY						
	IN-SITU TREATED RCRA SOIL: 225 BCY						
	CLAY PIPE: 55 BCY						
	ASSUME 30% OF THE SOIL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO THE OSDF QTY.:223411 BCY						
	PRODUCTION RATE: 100 BCY/ HR						
	HAUL DISTANCE (ROUND TRIP): 10000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	2,235.00	HRS	76.97	172,028	
		Labor	2,235	EQ	22.06	49,304	221,332
2 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH) 2 TRUCKS HAULING FROM EXCAVATION TO DEWATERING AREA 2 TRUCKS HAULING FROM DEWATERING AREA TO OSDF	Matl.	2,235.00	HRS	403.54	901,912	
		Labor	8,940	EQ	22.06	197,216	1,099,128
3 -A	SPOTTERS (4 EACH)	Matl.	2,235.00	HRS	0.00	0	
		Labor	8,940	DE	19.61	175,313	175,313

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
4 -A	CAT D-8 DOZER	Matl.	2,235.00	HRS	105.19	235,100	
		Labor	2,235	EQ	22.06	49,304	284,404
5 -A	CAT 966 FE LOADER	Matl.	2,235.00	HRS	76.56	171,112	
		Labor	2,235	EQ	22.06	49,304	220,416
6 -A	DISC HARROW	Matl.	2,235.00	HRS	20.00	44,700	
		Labor	0		0.00	0	44,700
7 -A	OILER	Matl.	2,235.00	HRS	0.00	0	
		Labor	2,235	EQ	22.06	49,304	49,304
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	2,235.00	HRS	74.27	165,993	
		Labor	2,235	EQ	22.06	49,304	215,297
9 -A	FOREMAN W/ TRUCK	Matl.	2,235.00	HRS	10.00	22,350	
		Labor	2,235	FO	30.00	67,050	89,400
****	SUBTOTAL ****	Matl.				1,713,195	
		Labor	31,290			686,099	2,399,294
	ASSUME THE REMAINING 70% OF SOIL WILL BE EXCAVATED, LOADED AND HAULED TO THE OSDF						
	QTY.: 521291 BCY						
	PRODUCTION RATE: 202 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 10000 LF						
10 -A	CAT 345 TRACHOE (2 EACH)	Matl.	2,581.00	HRS	153.94	397,319	
		Labor	5,162	EQ	22.06	113,874	511,193
11 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	2,581.00	HRS	403.54	1,041,537	
		Labor	10,324	EQ	22.06	227,747	1,269,284
12 -A	SPOTTERS (2 EACH)	Matl.	2,581.00	HRS	0.00	0	
		Labor	5,162	DE	19.61	101,227	101,227

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
13 -A	OILER	Matl.	2,581.00	HRS	0.00	0	
		Labor	2,581	EQ	22.06	56,937	56,937
14 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	2,581.00	HRS	74.27	191,691	
		Labor	2,581	EQ	22.06	56,937	248,628
15 -A	FOREMAN W/ TRUCK	Matl.	2,581.00	HRS	10.00	25,810	
		Labor	2,581	FO	30.00	77,430	103,240
****	SUBTOTAL ****	Matl.				1,656,357	
		Labor	28,391			634,152	2,290,509
16 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	15,517	ZZ	22.12	343,264	343,264
17 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	2,387	ZZ	22.12	52,805	52,805

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	3,369,552	1,716,320	5,085,872
TOTAL	3,369,552	(hrs. 77,585) 1,716,320	5,085,872

WBS ..... 1.3.4.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.17 BACKFILL
Discipline ..... C CIVIL AND SITE
B/M Title ..... BACKFILL

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.17 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	BACKFILL IN GENERAL EXCAVATION AREAS						
	TO BACKFILL THE GMA 5' ENCROACMENTS						
	QTY.: 14,483 FCY						
	PRODUCTION RATE: 112 FCY						
	ASSUME BORROW AREA ROUND TRIP HAUL						
	DISTANCE: 12000'						
	LOW PRODUCTION RATE DUE TO VARYING						
	SIZE OF PLACEMENT AREAS						
	BORROW AREA INCLUDING HAUL						
1 -A	CAT D-8 DOZER	Matl.	130.00	HRS	105.19	13,675	
		Labor	130	EQ	22.06	2,868	16,543
2 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	130.00	HRS	76.97	10,006	
		Labor	130	EQ	22.06	2,868	12,874
3 -A	CAT D400 ARTICULATED DUMP TRUCKS (4	Matl.	130.00	HRS	403.60	52,468	
	EACH)	Labor	520	EQ	22.06	11,471	63,939
4 -A	SPOTTER	Matl.	130.00	HRS	0.00	0	
		Labor	130	L	19.45	2,529	2,529
5 -A	FOREMAN W/ TRUCK	Matl.	130.00	HRS	10.00	1,300	
		Labor	130	FO	30.00	3,900	5,200
	PLACEMENT						
6 -A	CAT D-6 DOZER	Matl.	130.00	HRS	57.93	7,531	
		Labor	130	EQ	22.06	2,868	10,399
7 -A	CAT D-8 DOZER	Matl.	130.00	HRS	105.19	13,675	
		Labor	130	EQ	22.06	2,868	16,543

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	CAT 825C COMPACTOR	Matl.	130.00	HRS	123.61	16,069	
		Labor	130	EQ	22.06	2,868	18,937
9 -A	CAT CS-563 ROLLER	Matl.	130.00	HRS	39.75	5,168	
		Labor	130	EQ	22.06	2,868	8,036
10 -A	SPOTTER	Matl.	130.00	HRS	0.00	0	
		Labor	130	L	19.45	2,529	2,529
****	SUBTOTAL ****	Matl.				119,892	
		Labor	1,690			37,637	157,529
	BACKFILL DIVERSION DIKES						
	QTY.: 375 FCY						
	PRODUCTION RATE: 56 FCY/HR						
	SMALL QUANTITY ASSUME 1 DAYS FOR THIS DIKE ASSUME BORROW AREA ROUND TRIP HAUL DISTANCE: 12000' LOW PRODUCTION RATE DUE TO SMALL CROSS SECTIONAL AREA OF DIKE						
	BORROW AREA INCLUDING HAUL						
11 -A	CAT D-8 DOZER	Matl.	10.00	HRS	105.19	1,052	
		Labor	10	EQ	22.06	221	1,273
12 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	10.00	HRS	76.97	770	
		Labor	10	EQ	22.06	221	991
13 -A	CAT D400 ARTICULATED DUMP TRUCKS (2 EACH)	Matl.	10.00	HRS	201.80	2,018	
		Labor	20	EQ	22.06	441	2,459
14 -A	SPOTTER	Matl.	10.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
15 -A	FOREMAN W/ TRUCK	Matl.	10.00	HRS	10.00	100	
		Labor	10	FO	30.00	300	400
	PLACEMENT						
16 -A	CAT D-6 DOZER	Matl.	10.00	HRS	57.93	579	
		Labor	10	EQ	22.06	221	800

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
17 -A	CAT CP-323 COMPACTOR	Matl.	10.00	HRS	48.63	486	
		Labor	10	EQ	22.06	221	707
18 -A	CAT CS-563 ROLLER (SEAL SURFACE ONLY)	Matl.	10.00	HRS	39.75	398	
		Labor	0		0.00	0	398
19 -A	SPOTTER	Matl.	10.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
20 -A	GRADE CHECKER	Matl.	10.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
****	SUBTOTAL ****	Matl.				5,403	
		Labor	100			2,210	7,613
21 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	465	ZZ	22.26	10,351	10,351
22 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	72	ZZ	22.26	1,603	1,603

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	125,295	51,801	177,096
TOTAL	125,295	(hrs. 2,327) 51,801	177,096

WBS ..... 1.3.4.3 GROUNDWATER CNTRL
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C3.04 GROUNDWATER CONTROL
Discipline ..... C CIVIL AND SITE
B/M Title ..... GROUNDWATER CONTROL

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GW CONTROL
Quantity Take-Off By ... CIVIL
Trace Number C.3.4 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	GAS POWERED TRASH TYPE SUMP PUMPS						
1 -A	WACKER 4" DIA TRASH PUMP, 625 GPM @ 87' HD, 12 HP	Matl.	3.00	EA	7,240.00	21,720	
		Labor	0		0.00	0	21,720
2 -A	4" SUCTION HOSE, 200 PSI, ASSUME 100' PER PUMP ALLOWANCE FOR ABOVEGROUND PIPE - DRISCO	Matl.	300.00	LF	14.07	4,221	
		Labor	0		0.00	0	4,221
3 -A	ASSUME 4" AVERAGE SIZE	Matl.	5,000.00	LF	1.50	7,500	
		Labor	320	L	19.45	6,224	13,724
4 -A	CONNECTIONS TO EXISTING STORM DRAIN	Matl.	1.00	EA	250.00	250	
		Labor	8	L	19.45	156	406
	OPERATE PUMPS (ASSUME 4 HRS PER DAY)						
5 -A	OPERATOR	Matl.	26.00	MTH	100.00	2,600	
		Labor	2,262	EQ	22.06	49,900	52,500
6 -A	FLATBED TRUCK, 2-1/2 TON	Matl.	26.00	MTH	1,300.00	33,800	
		Labor	2,262	TD	20.78	47,004	80,804
	CONSTRUCT SEDIMENT PONDS						
	EXCAVATION IS COVERED BY GENERAL EXCAVATION QTY.: 1 EACH						
	ANCHOR TRENCH AT TOP OF SLOPE TO SECURE LINER						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	LENGTH: 640'						
	QTY.:48 CY						
	PRODUCTION: 10 CY/HR						
7 -A	CAT 446 BACKHOE	Matl.	5.00	HRS	18.85	94	
		Labor	5	EQ	22.06	110	204
8 -A	LABORERS (2 EACH)	Matl.	5.00	HRS	0.00	0	
		Labor	10	L	19.45	195	195
9 -A	FOREMAN W/ TRUCK	Matl.	5.00	HRS	10.00	50	
		Labor	5	FO	30.00	150	200
10 -A	INSTALL 40 MIL HDPE LINER, COST	Matl.	3,677.00	SY	4.50	16,547	
	INCLUDES INSTALLATION	Labor	0		0.00	0	16,547
11 -A	SAND BAGS - ALLOWANCE	Matl.	1.00	LOT	500.00	500	
		Labor	0		0.00	0	500
12 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	1,267	ZZ	21.29	26,978	26,978
13 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	195	ZZ	21.29	4,152	4,152

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	87,282	134,869	222,151
TOTAL	87,282	(hrs. 6,334) 134,869	222,151

ACD - FORMER PLANT AREA

WBS ..... 1.3.4.4 SITE PREPARATION
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C4.04 SITE PREP,ROADS,FENCING
Discipline ..... C CIVIL AND SITE
B/M Title ..... SITE PREP,ROADS,FENCING

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 4B
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SITE PREP
Quantity Take-Off By ... JLS
Trace Number C.4.4 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	BOUNDARY FENCING						
	OUTER PERIMETER (INCLUDING MAIN HAUL ROADS)						
1 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	4,100.00	LF	1.46	5,986	
		Labor	70	L	19.45	1,362	7,348
2 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	410.00	EA	6.36	2,608	
		Labor	41	L	19.45	797	3,405
	ABV-WAC AND RCRA AREAS						
3 -A	YELLOW AND MAGENTA STRIPED SAFETY BOUNDARY TAPE	Matl.	3,300.00	LF	0.17	561	
		Labor	3	L	19.45	58	619
4 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	330.00	EA	6.36	2,099	
		Labor	33	L	19.45	642	2,741
	SHUTTLE ACCESS CORRIDOR						
	CONSTRUCTED BY AREA 3B						
	DEEP EXCAVATIONS - ALLOWANCE						
5 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	1,000.00	LF	1.46	1,460	
		Labor	17	L	19.45	331	1,791
6 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	100.00	EA	6.36	636	
		Labor	10	L	19.45	195	831

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
****	SUBTOTAL ****	Matl.				13,350	
		Labor	174			3,385	16,735
	INITIAL EROSION CONTROL INSTALLATION						
7 -A	SILT FENCE W/ WOOD STAKES	Matl.	1,000.00	LF	0.95	950	
		Labor	17	L	19.45	331	1,281
8 -A	CAT 446 BACKHOE	Matl.	9.00	HRS	18.85	170	
		Labor	9	EQ	22.06	199	369
9 -A	5 TON FLATBED TRUCK	Matl.	9.00	HRS	40.00	360	
		Labor	9	TD	20.78	187	547
10 -A	FOREMAN W/ PICKUP TRUCK	Matl.	9.00	HRS	10.00	90	
		Labor	9	FO	30.00	270	360
11 -A	SEEDING	Matl.	27.00	ACRE	1,500.00	40,500	
		Labor	0		0.00	0	40,500
	MAINTAIN EROSION CONTROL DURING CONSTRUCTION - ALLOWANCE 1 WEEK PER MONTH @ 16 HRS/WK						
12 -A	5 TON FLATBED TRUCK	Matl.	26.00	MTH	640.00	16,640	
		Labor	416	TD	20.78	8,644	25,284
13 -A	CAT 446 BACKHOE	Matl.	26.00	MTH	301.60	7,842	
		Labor	416	EQ	22.06	9,177	17,019
14 -A	LABORERS	Matl.	26.00	MTH	0.00	0	
		Labor	832	L	19.45	16,182	16,182
15 -A	FOREMAN W/ PICKUP TRUCK	Matl.	26.00	MTH	160.00	4,160	
		Labor	416	FO	30.00	12,480	16,640
16 -A	SILT FENCE W/ WOOD STAKES ASSUME REPLACING 25% OF EXISTING SILT FENCE	Matl.	250.00	LF	0.95	238	
		Labor	4	L	19.45	78	316
****	SUBTOTAL ****	Matl.				70,950	
		Labor	2,128			47,548	118,498

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	CONSTRUCT MAIN HAUL ROADS						
	WIDTH: 24'						
	LENGTH: 700'						
	DEPTH: 1'						
	EARTHWORK PREPARATION ASSUME 12" DEEP						
	QTY.: 625 CY						
	PRODUCTION RATE: 120 FCY/ HR						
17 -A	D-8 DOZER	Matl.	6.00	HRS	105.19	631	
		Labor	6	EQ	22.06	132	763
18 -A	CAT 16H MOTOR GRADER	Matl.	6.00	HRS	110.25	662	
		Labor	6	EQ	22.06	132	794
19 -A	COMPACTOR 825C	Matl.	6.00	HRS	123.61	742	
		Labor	6	EQ	22.06	132	874
20 -A	CAT CS-563 ROLLER	Matl.	6.00	HRS	39.75	239	
		Labor	6	EQ	22.06	132	371
21 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	6.00	HRS	37.14	223	
		Labor	3	EQ	22.06	66	289
22 -A	SPOTTER (2 EACH)	Matl.	6.00	HRS	0.00	0	
		Labor	12	L	19.45	233	233
23 -A	FOREMAN W/ TRUCK	Matl.	6.00	HRS	10.00	60	
		Labor	6	FO	30.00	180	240
24 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	2,057.00	SY	1.50	3,086	
		Labor	14	L	19.45	272	3,358
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 625 CY						
	PRODUCTION RATE: 120 FCY/ HR						
25 -A	AGGREGATE BASE STONE	Matl.	1,258.00	TON	10.50	13,209	
		Labor	0		0.00	0	13,209
26 -A	D-8 DOZER	Matl.	6.00	HRS	105.19	631	
		Labor	6	EQ	22.06	132	763
27 -A	CAT 16H MOTOR GRADER	Matl.	6.00	HRS	110.25	662	
		Labor	6	EQ	22.06	132	794
28 -A	COMPACTOR 825C	Matl.	6.00	HRS	123.61	742	
		Labor	6	EQ	22.06	132	874
29 -A	CAT CS-563 ROLLER	Matl.	6.00	HRS	39.75	239	
		Labor	6	EQ	22.06	132	371
30 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	6.00	HRS	37.14	223	
		Labor	3	EQ	22.06	66	289
31 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	6.00	HRS	302.66	1,816	
		Labor	18	EQ	22.06	397	2,213
32 -A	SPOTTER (2 EACH)	Matl.	6.00	HRS	0.00	0	
		Labor	12	L	19.45	233	233
33 -A	FOREMAN W/ TRUCK	Matl.	6.00	HRS	10.00	60	
		Labor	6	FO	30.00	180	240
	MAINTAIN HAUL ROADS (ASSUME 1 WEEK PER MONTH)						
34 -A	CAT 16H MOTOR GRADER	Matl.	26.00	MTH	4,410.00	114,660	
		Labor	1,040	EQ	22.06	22,942	137,602
35 -A	CAT CS-563 ROLLER	Matl.	26.00	MTH	1,590.00	41,340	
		Labor	1,040	EQ	22.06	22,942	64,282
36 -A	DUMP TRUCK	Matl.	26.00	MTH	1,600.00	41,600	
		Labor	1,040	TD	20.78	21,611	63,211

ACD - FORMER PLANT AREA

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
37 -A	SPOTTER (2 EACH)	Matl.	26.00	MTH	0.00	0	
		Labor	2,080	L	19.45	40,456	40,456
38 -A	FOREMAN W/ TRUCK	Matl.	26.00	MTH	400.00	10,400	
		Labor	1,040	FO	30.00	31,200	41,600
	CONSTRUCT TEMPORARY HAUL ROADS AND LOADING AREAS AT CONTRACTORS DISCRETION						
	WIDTH: 24'						
	LENGTH: 4700'						
	DEPTH: 1'						
	HAUL AND PLACE AGGREGATE BASE STONE						
	AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 4178 CY						
	PRODUCTION RATE: 160 FCY/ HR						
39 -A	AGGREGATE BASE STONE	Matl.	7,103.00	TON	10.50	74,582	
		Labor	0		0.00	0	74,582
40 -A	D-8 DOZER	Matl.	27.00	HRS	105.19	2,840	
		Labor	27	EQ	22.06	596	3,436
41 -A	CAT 16H MOTOR GRADER	Matl.	27.00	HRS	110.25	2,977	
		Labor	27	EQ	22.06	596	3,573
42 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	27.00	HRS	37.14	1,003	
		Labor	14	EQ	22.06	309	1,312
43 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	27.00	HRS	302.66	8,172	
		Labor	81	EQ	22.06	1,787	9,959
44 -A	SPOTTER (2 EACH)	Matl.	27.00	HRS	0.00	0	
		Labor	54	L	19.45	1,050	1,050
45 -A	FOREMAN W/ TRUCK	Matl.	27.00	HRS	10.00	270	
		Labor	27	FO	30.00	810	1,080

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
****	SUBTOTAL ****	Matl.				321,069	
		Labor	6,592			146,982	468,051
	ALLOWANCE FOR MAINTENANCE ROADS						
	CONSTRUCT MAINTENANCE ROADS AT COMPLETION OF GENERAL EXCAVATION						
	WIDTH: 24'						
	LENGTH: 1600'						
	DEPTH: 1'						
	GRADE AND COMPACT SUBGRADE						
	AREA: 4267 SY						
	PRODUCTION RATE: 720 SY/HR						
46 -A	CAT 16H MOTOR GRADER	Matl.	6.00	HRS	110.25	662	
		Labor	6	EQ	22.06	132	794
47 -A	COMPACTOR 825C	Matl.	6.00	HRS	123.61	742	
		Labor	6	EQ	22.06	132	874
48 -A	CAT CS-563 ROLLER	Matl.	6.00	HRS	39.75	239	
		Labor	6	EQ	22.06	132	371
49 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	6.00	HRS	37.14	223	
		Labor	3	EQ	22.06	66	289
50 -A	SPOTTER (2 EACH)	Matl.	6.00	HRS	0.00	0	
		Labor	12	L	19.45	233	233
51 -A	FOREMAN W/ TRUCK	Matl.	6.00	HRS	10.00	60	
		Labor	6	FO	30.00	180	240
52 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	4,694.00	SY	1.50	7,041	
		Labor	33	L	19.45	642	7,683

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA. QTY.: 1423 CY PRODUCTION RATE: 120 FCY/ HR						
53 -A	AGGREGATE BASE STONE	Matl.	2,419.00	TON	10.50	25,400	
		Labor	0		0.00	0	25,400
54 -A	D-8 DOZER	Matl.	12.00	HRS	105.19	1,262	
		Labor	12	EQ	22.06	265	1,527
55 -A	CAT 16H MOTOR GRADER	Matl.	12.00	HRS	110.25	1,323	
		Labor	12	EQ	22.06	265	1,588
56 -A	COMPACTOR 825C	Matl.	12.00	HRS	123.61	1,483	
		Labor	12	EQ	22.06	265	1,748
57 -A	CAT CS-563 ROLLER	Matl.	12.00	HRS	39.75	477	
		Labor	12	EQ	22.06	265	742
58 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	12.00	HRS	37.14	446	
		Labor	6	EQ	22.06	132	578
59 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	12.00	HRS	302.66	3,632	
		Labor	36	EQ	22.06	794	4,426
60 -A	SPOTTER (2 EACH)	Matl.	12.00	HRS	0.00	0	
		Labor	24	L	19.45	467	467
61 -A	FOREMAN W/ TRUCK	Matl.	12.00	HRS	10.00	120	
		Labor	12	FO	30.00	360	480
****	SUBTOTAL ****	Matl.				43,110	
		Labor	198			4,330	47,440
62 -A	ALLOWANCE FOR DECON STATIONS FOR ACCESS TO CLEAN AREAS AFTER CERTIFICATION	Matl.	2.00	LOT	20,000.00	40,000	
		Labor	0		0.00	0	40,000
****	SUBTOTAL ****	Matl.				40,000	
		Labor	0			0	40,000

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
63 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	2,364	ZZ	22.24	52,585	52,585
64 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	364	ZZ	22.24	8,097	8,097

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	488,479	262,927	751,406
TOTAL	488,479	(hrs. 11,820) 262,927	751,406

WBS ..... 1.3.4.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.10 GENERAL REQUIREMENTS
Discipline ..... C CIVIL AND SITE
B/M Title ..... GENERAL REQUIREMENTS

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... J.SMITH
Trace Number C.5.10 0

Cross-Cut Code ....
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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
1 -A	PORTABLE COOL DOWN TRAILER, SELF CONTAINED POWER AND COOLING (2 EACH)	Matl.	26.00	MTH	500.00	13,000	
		Labor	0		0.00	0	13,000
2 -A	GENERATOR FOR COOL DOWN TRAILERS (2 EACH)	Matl.	26.00	MTH	40.00	1,040	
		Labor	0		0.00	0	1,040
3 -A	PORTABLE OFFICE TRAILER	Matl.	26.00	MTH	600.00	15,600	
		Labor	0		0.00	0	15,600
4 -A	SAFETY ENGINEER FULL TIME	Matl.	26.00	MTH	0.00	0	
		Labor	5,642	SE	40.00	225,680	225,680
5 -A	FIELD ENGINEER FULL TIME (2 EACH)	Matl.	52.00	MTH	0.00	0	
		Labor	11,284	FE	40.00	451,360	451,360
6 -A	SUPERIENTENDENT FULL TIME	Matl.	26.00	MTH	0.00	0	
		Labor	5,642	SU	50.00	282,100	282,100
7 -A	SECRETARY	Matl.	26.00	MTH	0.00	0	
		Labor	4,498	S	12.00	53,976	53,976
8 -A	SCHEDULER	Matl.	26.00	MTH	0.00	0	
		Labor	5,642	SD	30.00	169,260	169,260
9 -A	ESTIMATOR	Matl.	26.00	MTH	0.00	0	
		Labor	4,498	ES	30.00	134,940	134,940
10 -A	HEALTH PHYSICS TECHNICIAN (2 EACH)	Matl.	52.00	MTH	0.00	0	
		Labor	11,284	HP	30.00	338,520	338,520
11 -A	PICKUP TRUCKS 4X4, 8 EACH	Matl.	26.00	MTH	4,800.00	124,800	
		Labor	0		0.00	0	124,800

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
12 -A	PHONE	Matl.	26.00	MTH	300.00	7,800	
		Labor	0		0.00	0	7,800
13 -A	MISC. OFFICE EQUIPMENT	Matl.	1.00	LOT	25,000.00	25,000	
		Labor	0		0.00	0	25,000

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	187,240	1,655,836	1,843,076
TOTAL	187,240	(hrs. 48,490) 1,655,836	1,843,076

ACD - FORMER PLANT AREA

WBS ..... 1.3.4.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.11 MOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... MOBILIZATION

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Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.11 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	** PROJECT MOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES TWO WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	81.00	EA	4,000.00	324,000	
		Labor	0		0.00	0	324,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	12.00	EA	60.00	720	
		Labor	48	EQ	22.06	1,059	1,779
3 -A	HOE RAM	Matl.	12.00	EA	60.00	720	
		Labor	48	EQ	22.06	1,059	1,779
4 -A	SHEARS	Matl.	12.00	EA	60.00	720	
		Labor	48	EQ	22.06	1,059	1,779
5 -A	JAW CRUSHER	Matl.	6.00	EA	60.00	360	
		Labor	24	EQ	22.06	529	889
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	12.00	EA	0.00	0	
		Labor	24	EQ	22.06	529	529
7 -A	FLAT BED TRUCK - 5 TON	Matl.	12.00	EA	0.00	0	
		Labor	24	EQ	22.06	529	529
			141				

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	60.00	EA	0.00	0	
		Labor	120	EQ	22.06	2,647	2,647
9 -A	CAT 613C WATER WAGON	Matl.	24.00	EA	240.00	5,760	
		Labor	288	EQ	22.06	6,353	12,113
10 -A	CAT 988 FE LOADER	Matl.	24.00	EA	120.00	2,880	
		Labor	192	EQ	22.06	4,236	7,116
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	120.00	EA	1,000.00	120,000	
		Labor	0		0.00	0	120,000
12 -A	CAT D8 DOZER	Matl.	24.00	EA	120.00	2,880	
		Labor	96	EQ	22.06	2,118	4,998
13 -A	CAT 446 BACKHOE	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
14 -A	CAT 16H GRADER	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
15 -A	CAT 825C COMPACTOR	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
16 -A	CAT CS-563 ROLLER	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
17 -A	TRACK DRILL	Matl.	3.00	EA	120.00	360	
		Labor	12	EQ	22.06	265	625
18 -A	AIR COMPRESSOR	Matl.	3.00	EA	120.00	360	
		Labor	6	EQ	22.06	132	492
19 -A	PRESSURE WASHER	Matl.	12.00	EA	30.00	360	
		Labor	12	EQ	22.06	265	625

000255

2250

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	464,880	29,252	494,132
TOTAL	464,880	(hrs. 1,326) 29,252	494,132

ACD - FORMER PLANT AREA

WBS ..... 1.3.4.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.12 DEMOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... DEMOBILIZATION

Cross-Cut Code ....
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Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.12 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 4B						
	** PROJECT DEMOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES TWO WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	81.00	EA	4,000.00	324,000	
		Labor	0		0.00	0	324,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	12.00	EA	60.00	720	
		Labor	48	EQ	22.06	1,059	1,779
3 -A	HOE RAM	Matl.	12.00	EA	60.00	720	
		Labor	48	EQ	22.06	1,059	1,779
4 -A	SHEARS	Matl.	12.00	EA	60.00	720	
		Labor	48	EQ	22.06	1,059	1,779
5 -A	JAW CRUSHER	Matl.	6.00	EA	60.00	360	
		Labor	24	EQ	22.06	529	889
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	12.00	EA	0.00	0	
		Labor	24	EQ	22.06	529	529
7 -A	FLAT BED TRUCK - 5 TON	Matl.	12.00	EA	0.00	0	
		Labor	24	EQ	22.06	529	529

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	60.00	EA	0.00	0	
		Labor	120	EQ	22.06	2,647	2,647
9 -A	CAT 613C WATER WAGON	Matl.	24.00	EA	240.00	5,760	
		Labor	288	EQ	22.06	6,353	12,113
10 -A	CAT 988 FE LOADER	Matl.	24.00	EA	120.00	2,880	
		Labor	192	EQ	22.06	4,236	7,116
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	120.00	EA	1,000.00	120,000	
		Labor	0		0.00	0	120,000
12 -A	CAT D8 DOZER	Matl.	24.00	EA	120.00	2,880	
		Labor	96	EQ	22.06	2,118	4,998
13 -A	CAT 446 BACKHOE	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
14 -A	CAT 16H GRADER	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
15 -A	CAT 825C COMPACTOR	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
16 -A	CAT CS-563 ROLLER	Matl.	12.00	EA	120.00	1,440	
		Labor	96	EQ	22.06	2,118	3,558
17 -A	TRACK DRILL	Matl.	3.00	EA	120.00	360	
		Labor	12	EQ	22.06	265	625
18 -A	AIR COMPRESSOR	Matl.	3.00	EA	120.00	360	
		Labor	6	EQ	22.06	132	492
19 -A	PRESSURE WASHER	Matl.	12.00	EA	30.00	360	
		Labor	12	EQ	22.06	265	625
	DECONTAMINATION OF EQUIPMENT BEFORE TRANSPORT OFF-SITE						
20 -A	DECON THROUGH FREE RELEASE WASH STATION	Matl.	465.00	PCS	100.00	46,500	
		Labor	5,580	L	19.45	108,531	155,031

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	511,380	137,783	649,163
TOTAL	511,380	(hrs. 6,906) 137,783	649,163

000259

WBS ..... 1.3.5.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.05 CONCRETE FOUNDATIONS
Discipline ..... C CIVIL AND SITE
B/M Title ..... CONCRETE FOUNDATIONS

Cross-Cut Code ....
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Building/Area 5
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.5 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	DEMOLISH, SIZE REDUCE, LOAD AND HAUL CONCRETE						
	QTY.: 16361 BCY						
	PRODUCTION RATE: 48 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 12000 LF						
1 -A	CAT 345 TRACHOE W/ GRAPPLE(4 EACH)	Matl.	341.00	HRS	359.52	122,596	
		Labor	1,364	EQ	22.06	30,090	152,686
2 -A	CAT 345 TRACHOE W/ HOE RAM (4 EACH)	Matl.	341.00	HRS	400.00	136,400	
		Labor	1,364	EQ	22.06	30,090	166,490
3 -A	CAT 345 TRACHOE W/ SHEARS (4 EACH)	Matl.	341.00	HRS	521.28	177,756	
		Labor	1,364	EQ	22.06	30,090	207,846
4 -A	CAT 345 TRACHOE W/ JAW CRUSHERS (2 EACH)	Matl.	341.00	HRS	221.74	75,613	
		Labor	682	EQ	22.06	15,045	90,658
5 -A	CAT D400E ARTICULATED DUMP TRUCKS (2 EACH)	Matl.	341.00	HRS	201.77	68,804	
		Labor	682	EQ	22.06	15,045	83,849
6 -A	SPOTTERS (4 EACH)	Matl.	341.00	HRS	0.00	0	
		Labor	1,364	DE	19.61	26,748	26,748
7 -A	OILERS (ASSUME 1 PER 4 PIECES HVY EQUIP.)	Matl.	341.00	HRS	0.00	0	
		Labor	1,364	EQ	22.06	30,090	30,090
8 -A	ACETYLENE TORCH SETUP (4 EACH)	Matl.	341.00	HRS	40.00	13,640	
		Labor	1,364	BL	20.50	27,962	41,602
9 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	341.00	HRS	74.27	25,326	
		Labor	341	EQ	22.06	7,522	32,848

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
10 -A	4000 GAL WATER TRUCK W/ HOSE AND WATER CANNON SPRAYER (4 EACH)	Matl.	341.00	HRS	99.70	33,998	
		Labor	1,364	TD	20.78	28,344	62,342
11 -A	FOREMAN W/ TRUCK (2 EACH)	Matl.	341.00	HRS	20.00	6,820	
		Labor	682	FO	30.00	20,460	27,280
****	SUBTOTAL ****	Matl.				660,953	
		Labor	11,935			261,486	922,439
	BLASTING CREW (AT 50% OF DEMO HOURS)						
12 -A	INGERSOLL-RAND ECM 350/ VL671 AIR DRIVEN TRACK DRILL	Matl.	171.00	HRS	22.09	3,777	
		Labor	171	EQ	22.06	3,772	7,549
13 -A	AIR COMPRESSOR, ROTARY SCREW, 260 HP, 900 CFM	Matl.	171.00	HRS	24.96	4,268	
		Labor	0		0.00	0	4,268
14 -A	LOADING CREW	Matl.	171.00	HRS	0.00	0	
		Labor	342	DE	19.61	6,707	6,707
15 -A	BLASTING SUPERVISOR	Matl.	171.00	HRS	0.00	0	
		Labor	171	FO	30.00	5,130	5,130
16 -A	BLASTING MATERIALS	Matl.	171.00	HRS	100.00	17,100	
		Labor	0		0.00	0	17,100
****	SUBTOTAL ****	Matl.				25,145	
		Labor	684			15,609	40,754
17 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	3,281	ZZ	21.96	72,046	72,046
18 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	505	ZZ	21.96	11,089	11,089

000261

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	686,098	360,230	1,046,328
TOTAL	686,098	(hrs. 16,405) 360,230	1,046,328

WBS ..... 1.3.5.1 FDN & UTIL. REMOVALS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C1.10 ASPHALT REMOVAL
Discipline ..... C CIVIL AND SITE
B/M Title ..... ASPHALT REMOVAL

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Building/Area 5
Plant Site ..... F
Contracting Type ..... S Subcontractor
Funding Type ..... LINE ITEM

Discipline Estimator ... FDN & UTILITY
Quantity Take-Off By ... RI/FS
Trace Number C.1.10 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	BREAKUP, LOAD AND HAUL ASPHALT PARKING SURFACE QTY.: 2156 BCY						
	PRODUCTION RATE: 84 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 12000 LF						
1 -A	CAT 345 TRACHOE	Matl.	26.00	HRS	76.97	2,001	
		Labor	26	EQ	22.06	574	2,575
2 -A	CAT D-8 DOZER	Matl.	26.00	HRS	105.19	2,735	
		Labor	26	EQ	22.06	574	3,309
3 -A	CAT D400E ARTICULATED DUMP (2 EACH)	Matl.	26.00	HRS	201.77	5,246	
		Labor	52	EQ	22.06	1,147	6,393
4 -A	SPOTTERS (2 EACH)	Matl.	26.00	HRS	0.00	0	
		Labor	52	DE	19.61	1,020	1,020
5 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	26.00	HRS	74.27	1,931	
		Labor	26	EQ	22.06	574	2,505
6 -A	FOREMAN W/ TRUCK	Matl.	26.00	HRS	10.00	260	
		Labor	26	FO	30.00	780	1,040
****	SUBTOTAL ****	Matl.				12,173	
		Labor	208			4,669	16,842

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	54	ZZ	22.45	1,212	1,212
8 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	8	ZZ	22.45	180	180

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	12,173	6,061	18,234
TOTAL	12,173	(hrs. 270) 6,061	18,234

ACD - FORMER PLANT AREA

WBS ..... 1.3.5.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.13 SOIL EXCAVATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... SOIL EXCAVATION

Building/Area 5
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.13 0

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Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	TOTAL QUANTITY OF SOIL: 48,456 BCY						
	GENERAL EXCAVATION: 48,423 BCY						
	IN-SITU TREATED RCRA SOIL: 0						
	CLAY PIPE: 33 BCY						
	ASSUME 30% OF THE SOIL WILL BE EXCAVATED, LOADED AND HAULED TO DEWATERING AREA. WHEN SOIL HAS ZERO FREE LIQUIDS IT WILL BE LOADED AND HAULED TO THE OSDF QTY.: 14537 BCY						
	PRODUCTION RATE: 100 BCY/ HR						
	HAUL DISTANCE (ROUND TRIP): 12000 LF						
1 -A	CAT 345 TRACHOE 1 EACH	Matl.	146.00	HRS	76.97	11,238	
		Labor	146	EQ	22.06	3,221	14,459
2 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	146.00	HRS	403.54	58,917	
		Labor	584	EQ	22.06	12,883	71,800
	2 TRUCKS HAULING FROM EXCAVATION TO DEWATERING AREA						
	2 TRUCKS HAULING FROM DEWATERING AREA TO OSDF						
3 -A	SPOTTERS (4 EACH)	Matl.	146.00	HRS	0.00	0	
		Labor	584	DE	19.61	11,452	11,452
			152				

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
4 -A	CAT D-8 DOZER	Matl.	146.00	HRS	105.19	15,358	
		Labor	146	EQ	22.06	3,221	18,579
5 -A	CAT 966 FE LOADER	Matl.	146.00	HRS	76.56	11,178	
		Labor	146	EQ	22.06	3,221	14,399
6 -A	DISC HARROW	Matl.	146.00	HRS	20.00	2,920	
		Labor	0		0.00	0	2,920
7 -A	OILER	Matl.	146.00	HRS	0.00	0	
		Labor	146	EQ	22.06	3,221	3,221
8 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	146.00	HRS	74.27	10,843	
		Labor	146	EQ	22.06	3,221	14,064
9 -A	FOREMAN W/ TRUCK	Matl.	146.00	HRS	10.00	1,460	
		Labor	146	FO	30.00	4,380	5,840
****	SUBTOTAL ****	Matl.				111,914	
		Labor	2,044			44,820	156,734
	ASSUME THE REMAINING 70% OF SOIL WILL BE EXCAVATED, LOADED AND HAULED TO THE OSDF						
	QTY.: 33919 BCY						
	PRODUCTION RATE: 202 BCY/ HR						
	HAUL DISTANCE(ROUND TRIP): 12000 LF						
10 -A	CAT 345 TRACHOE (2 EACH)	Matl.	168.00	HRS	153.94	25,862	
		Labor	336	EQ	22.06	7,412	33,274
11 -A	CAT D400E ARTICULATED DUMP TRUCK (4 EACH)	Matl.	168.00	HRS	403.54	67,795	
		Labor	672	EQ	22.06	14,824	82,619
12 -A	SPOTTERS (2 EACH)	Matl.	168.00	HRS	0.00	0	
		Labor	336	DE	19.61	6,589	6,589

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
13 -A	OILER	Matl.	168.00	HRS	0.00	0	
		Labor	168	EQ	22.06	3,706	3,706
14 -A	CAT 613C WATER WAGON (1 EACH)	Matl.	168.00	HRS	74.27	12,477	
		Labor	168	EQ	22.06	3,706	16,183
15 -A	FOREMAN W/ TRUCK	Matl.	168.00	HRS	10.00	1,680	
		Labor	168	FO	30.00	5,040	6,720
****	SUBTOTAL ****	Matl.				107,814	
		Labor	1,848			41,277	149,091
16 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	1,012	ZZ	22.12	22,387	22,387
17 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	156	ZZ	22.12	3,451	3,451

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	219,728	111,935	331,663
TOTAL	219,728	(hrs. 5,060) 111,935	331,663

WBS ..... 1.3.5.2 SOIL EXCAVATION
Cost Code ..... 2000 IMPROVEMENT TO LAND
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C2.18 BACKFILL
Discipline ..... C CIVIL AND SITE
B/M Title ..... BACKFILL

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 5
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SOIL EXCAVATION
Quantity Take-Off By ... OTHERS
Trace Number C.2.18 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	BACKFILL DIVERSION DIKES						
	QTY.: 680 FCY						
	PRODUCTION RATE: 56 FCY/HR						
	SMALL QUANTITY ASSUME 2 DAYS FOR THIS DIKE ASSUME BORROW AREA ROUND TRIP HAUL DISTANCE: 12000' LOW PRODUCTION RATE DUE TO SMALL CROSS SECTIONAL AREA OF DIKE						
	BORROW AREA INCLUDING HAUL						
1 -A	CAT D-8 DOZER	Matl.	20.00	HRS	105.19	2,104	
		Labor	20	EQ	22.06	441	2,545
2 -A	CAT 345 TRACHOE, 3.5 CY BUCKET	Matl.	20.00	HRS	76.97	1,539	
		Labor	20	EQ	22.06	441	1,980
3 -A	CAT D400 ARTICULATED DUMP TRUCKS (2 EACH)	Matl.	20.00	HRS	201.80	4,036	
		Labor	40	EQ	22.06	882	4,918
4 -A	SPOTTER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
5 -A	FOREMAN W/ TRUCK	Matl.	20.00	HRS	10.00	200	
		Labor	20	FO	30.00	600	800
	PLACEMENT						
6 -A	CAT D-6 DOZER	Matl.	20.00	HRS	57.93	1,159	
		Labor	20	EQ	22.06	441	1,600

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	CAT CP-323 COMPACTOR	Matl.	20.00	HRS	48.63	973	
		Labor	20	EQ	22.06	441	1,414
8 -A	CAT CS-563 ROLLER (SEAL SURFACE ONLY)	Matl.	20.00	HRS	39.75	795	
		Labor	0		0.00	0	795
9 -A	SPOTTER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
10 -A	GRADE CHECKER	Matl.	20.00	HRS	0.00	0	
		Labor	20	L	19.45	389	389
****	SUBTOTAL ****	Matl.				10,806	
		Labor	200			4,413	15,219
11 -A	LOSS TIME PPE,TRANSPORT	Matl.	0.00		0.00	0	
		Labor	52	ZZ	22.07	1,147	1,147
12 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	8	ZZ	22.07	177	177

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	10,806	5,737	16,543
TOTAL	10,806	(hrs. 260) 5,737	16,543

000269

ACD - FORMER PLANT AREA

WBS ..... 1.3.5.3 GROUNDWATER CNTRL
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C3.05 GROUNDWATER CONTROL
Discipline ..... C CIVIL AND SITE
B/M Title ..... GROUNDWATER CONTROL

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 5
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GW CONTROL
Quantity Take-Off By ... CIVIL
Trace Number C.3.5 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	GAS POWERED TRASH TYPE SUMP PUMPS						
1 -A	WACKER 4" DIA TRASH PUMP, 625 GPM @ 87' HD, 12 HP	Matl.	2.00	EA	7,240.00	14,480	
		Labor	0		0.00	0	14,480
2 -A	4" SUCTION HOSE, 200 PSI, ASSUME 100' PER PUMP	Matl.	200.00	LF	14.07	2,814	
		Labor	0		0.00	0	2,814
	ALLOWANCE FOR ABOVEGROUND PIPE - DRISCO						
3 -A	ASSUME 4" AVERAGE SIZE	Matl.	5,000.00	LF	1.50	7,500	
		Labor	320	L	19.45	6,224	13,724
4 -A	CONNECTIONS TO EXISTING STORM DRAIN	Matl.	2.00	EA	250.00	500	
		Labor	16	L	19.45	311	811
	OPERATE PUMPS (ASSUME 4 HRS PER DAY)						
5 -A	OPERATOR	Matl.	17.00	MTH	100.00	1,700	
		Labor	1,479	EQ	22.06	32,627	34,327
6 -A	FLATBED TRUCK, 2-1/2 TON	Matl.	17.00	MTH	1,300.00	22,100	
		Labor	1,479	TD	20.78	30,734	52,834
7 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	856	ZZ	21.22	18,164	18,164
8 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	132	ZZ	21.22	2,801	2,801

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	49,094	90,861	139,955
TOTAL	49,094	(hrs. 4,282) 90,861	139,955

000271

2250

WBS ..... 1.3.5.4 SITE PREPARATION
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C4.05 SITE PREP,ROADS,FENCING
Discipline ..... C CIVIL AND SITE
B/M Title ..... SITE PREP,ROADS,FENCING

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 5
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SITE PREP
Quantity Take-Off By ... JLS
Trace Number C.4.5 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	BOUNDARY FENCING						
	OUTER PERIMETER (INCLUDING MAIN HAUL ROADS)						
1 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	5,400.00	LF	1.46	7,884	
		Labor	92	L	19.45	1,789	9,673
2 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	540.00	EA	6.36	3,434	
		Labor	54	L	19.45	1,050	4,484
	SHUTTLE ACCESS CORRIDOR						
3 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	200.00	LF	1.46	292	
		Labor	3	L	19.45	58	350
4 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	20.00	EA	6.36	127	
		Labor	2	L	19.45	39	166
	SWITCHYARD AREA						
5 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	1,200.00	LF	1.46	1,752	
		Labor	20	L	19.45	389	2,141
6 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	120.00	EA	6.36	763	
		Labor	12	L	19.45	233	996
	DEEP EXCAVATIONS - ALLOWANCE						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	ORANGE CONSTRUCTION SAFETY FENCE, 5' HIGH	Matl.	1,000.00	LF	1.46	1,460	
		Labor	17	L	19.45	331	1,791
8 -A	6' LG STEEL FENCE POST SPACED AT 10' O.C.	Matl.	100.00	EA	6.36	636	
		Labor	10	L	19.45	195	831
****	SUBTOTAL ****	Matl.				16,348	
		Labor	210			4,084	20,432
	INITIAL EROSION CONTROL INSTALLATION						
9 -A	SILT FENCE W/ WOOD STAKES	Matl.	2,800.00	LF	0.95	2,660	
		Labor	48	L	19.45	934	3,594
10 -A	CAT 446 BACKHOE	Matl.	24.00	HRS	18.85	452	
		Labor	24	EQ	22.06	529	981
11 -A	5 TON FLATBED TRUCK	Matl.	24.00	HRS	40.00	960	
		Labor	24	TD	20.78	499	1,459
12 -A	FOREMAN W/ PICKUP TRUCK	Matl.	24.00	HRS	10.00	240	
		Labor	24	FO	30.00	720	960
13 -A	SEEDING	Matl.	18.00	ACRE	1,500.00	27,000	
		Labor	0		0.00	0	27,000
	MAINTAIN EROSION CONTROL DURING CONSTRUCTION 1 WEEK PER MONTH @ 16 HRS/WK						
14 -A	5 TON FLATBED TRUCK	Matl.	17.00	MTH	640.00	10,880	
		Labor	272	TD	20.78	5,652	16,532
15 -A	CAT 446 BACKHOE	Matl.	17.00	MTH	301.60	5,127	
		Labor	272	EQ	22.06	6,000	11,127
16 -A	LABORERS	Matl.	17.00	MTH	0.00	0	
		Labor	544	L	19.45	10,581	10,581
17 -A	FOREMAN W/ PICKUP TRUCK	Matl.	17.00	MTH	160.00	2,720	
		Labor	272	FO	30.00	8,160	10,880
			160				

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
18 -A	SILT FENCE W/ WOOD STAKES ASSUME	Matl.	700.00	LF	0.95	665	
	REPLACING 25% OF EXISTING SILT FENCE	Labor	12	L	19.45	233	898
****	SUBTOTAL ****	Matl.				50,704	
		Labor	1,492			33,308	84,012
	CONSTRUCT MAIN HAUL ROADS						
	WIDTH: 24'						
	LENGTH: 200'						
	DEPTH: 1'						
	EARTHWORK PREPARATION ASSUME 12" DEEP						
	QTY.: 180 CY						
	PRODUCTION RATE: 120 FCY/ HR						
19 -A	D-8 DOZER	Matl.	2.00	HRS	105.19	210	
		Labor	2	EQ	22.06	44	254
20 -A	CAT 16H MOTOR GRADER	Matl.	2.00	HRS	110.25	221	
		Labor	2	EQ	22.06	44	265
21 -A	COMPACTOR 825C	Matl.	2.00	HRS	123.61	247	
		Labor	2	EQ	22.06	44	291
22 -A	CAT CS-563 ROLLER	Matl.	2.00	HRS	39.75	80	
		Labor	2	EQ	22.06	44	124
23 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	2.00	HRS	37.14	74	
		Labor	1	EQ	22.06	22	96
24 -A	SPOTTER (2 EACH)	Matl.	2.00	HRS	0.00	0	
		Labor	4	L	19.45	78	78
25 -A	FOREMAN W/ TRUCK	Matl.	2.00	HRS	10.00	20	
		Labor	2	FO	30.00	60	80
26 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	589.00	SY	1.50	884	
		Labor	4	L	19.45	78	962

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA. QTY.: 180 CY PRODUCTION RATE: 120 FCY/ HR						
27 -A	AGGREGATE BASE STONE	Matl.	306.00	TON	10.50	3,213	
		Labor	0		0.00	0	3,213
28 -A	D-8 DOZER	Matl.	2.00	HRS	105.19	210	
		Labor	2	EQ	22.06	44	254
29 -A	CAT 16H MOTOR GRADER	Matl.	2.00	HRS	110.25	221	
		Labor	2	EQ	22.06	44	265
30 -A	COMPACTOR 825C	Matl.	2.00	HRS	123.61	247	
		Labor	2	EQ	22.06	44	291
31 -A	CAT CS-563 ROLLER	Matl.	2.00	HRS	39.75	80	
		Labor	2	EQ	22.06	44	124
32 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	2.00	HRS	37.14	74	
		Labor	1	EQ	22.06	22	96
33 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	2.00	HRS	302.66	605	
		Labor	6	EQ	22.06	132	737
34 -A	SPOTTER (2 EACH)	Matl.	2.00	HRS	0.00	0	
		Labor	4	L	19.45	78	78
35 -A	FOREMAN W/ TRUCK	Matl.	2.00	HRS	10.00	20	
		Labor	2	FO	30.00	60	80
	MAINTAIN HAUL ROADS (ASSUME 1 WEEK PER MONTH)						
36 -A	CAT 16H MOTOR GRADER	Matl.	17.00	MTH	4,410.00	74,970	
		Labor	680	EQ	22.06	15,001	89,971

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
37 -A	CAT CS-563 ROLLER	Matl.	17.00	MTH	1,590.00	27,030	
		Labor	680	EQ	22.06	15,001	42,031
38 -A	DUMP TRUCK	Matl.	17.00	MTH	1,600.00	27,200	
		Labor	680	TD	20.78	14,130	41,330
39 -A	SPOTTER (2 EACH)	Matl.	17.00	MTH	0.00	0	
		Labor	1,360	L	19.45	26,452	26,452
40 -A	FOREMAN W/ TRUCK	Matl.	17.00	MTH	400.00	6,800	
		Labor	680	FO	30.00	20,400	27,200
	CONSTRUCT TEMPORARY HAUL ROADS AND LOADING AREAS AT CONTRACTORS DISCRETION WIDTH: 24' LENGTH: 2200' DEPTH: 1'						
	HAUL AND PLACE AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA. QTY.: 1956 CY PRODUCTION RATE: 160 FCY/ HR						
41 -A	AGGREGATE BASE STONE	Matl.	3,325.00	TON	10.50	34,913	
		Labor	0		0.00	0	34,913
42 -A	D-8 DOZER	Matl.	13.00	HRS	105.19	1,367	
		Labor	13	EQ	22.06	287	1,654
43 -A	CAT 16H MOTOR GRADER	Matl.	13.00	HRS	110.25	1,433	
		Labor	13	EQ	22.06	287	1,720
44 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	13.00	HRS	37.14	483	
		Labor	7	EQ	22.06	154	637
45 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	13.00	HRS	302.66	3,935	
		Labor	39	EQ	22.06	860	4,795

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
46 -A	SPOTTER (2 EACH)	Matl.	13.00	HRS	0.00	0	
		Labor	26	L	19.45	506	506
47 -A	FOREMAN W/ TRUCK	Matl.	13.00	HRS	10.00	130	
		Labor	13	FO	30.00	390	520
	CONSTRUCT CONTINGENCY HAUL ROAD TO AREA 7						
	WIDTH: 24'						
	LENGTH: 700'						
	DEPTH: 1'						
	HAUL AND PLACE AGGREGATE BASE STONE						
	AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 623 CY						
	PRODUCTION RATE: 160 FCY/ HR						
48 -A	AGGREGATE BASE STONE	Matl.	1,059.00	TON	10.50	11,120	
		Labor	0		0.00	0	11,120
49 -A	D-8 DOZER	Matl.	4.00	HRS	105.19	421	
		Labor	4	EQ	22.06	88	509
50 -A	CAT 16H MOTOR GRADER	Matl.	4.00	HRS	110.25	441	
		Labor	4	EQ	22.06	88	529
51 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	4.00	HRS	37.14	149	
		Labor	2	EQ	22.06	44	193
52 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	4.00	HRS	302.66	1,211	
		Labor	12	EQ	22.06	265	1,476
53 -A	SPOTTER (2 EACH)	Matl.	4.00	HRS	0.00	0	
		Labor	8	L	19.45	156	156

000277

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
54 -A	FOREMAN W/ TRUCK	Matl.	4.00	HRS	10.00	40	
		Labor	4	FO	30.00	120	160
****	SUBTOTAL ****	Matl.				198,049	
		Labor	4,265			95,111	293,160
	ALLOWANCE FOR MAINTENANCE ROADS						
	CONSTRUCT MAINTENANCE ROADS AT COMPLETION OF GENERAL EXCAVATION WIDTH: 24'						
	LENGTH: 410'						
	DEPTH: 1'						
	GRADE AND COMPACT SUBGRADE						
	AREA: 1094 SY						
	PRODUCTION RATE: 720 SY/HR						
55 -A	CAT 16H MOTOR GRADER	Matl.	2.00	HRS	110.25	221	
		Labor	2	EQ	22.06	44	265
56 -A	COMPACTOR 825C	Matl.	2.00	HRS	123.61	247	
		Labor	2	EQ	22.06	44	291
57 -A	CAT CS-563 ROLLER	Matl.	2.00	HRS	39.75	80	
		Labor	2	EQ	22.06	44	124
58 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	2.00	HRS	37.14	74	
		Labor	1	EQ	22.06	22	96
59 -A	SPOTTER (2 EACH)	Matl.	2.00	HRS	0.00	0	
		Labor	4	L	19.45	78	78
60 -A	FOREMAN W/ TRUCK	Matl.	2.00	HRS	10.00	20	
		Labor	2	FO	30.00	60	80

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
61 -A	STABILIZATION MATTING BELOW AGGRGATE	Matl.	1,204.00	SY	1.50	1,806	
		Labor	8	L	19.45	156	1,962
	SPREAD AND COMPACT AGGREGATE BASE STONE AGGREGATE WILL BE PURCHASED AND DELIVERED TO A STOCKPILE. THE CONTRACTOR WILL LOAD AND HAUL INTO EXCAVATION AREA.						
	QTY.: 365 CY						
	PRODUCTION RATE: 120 FCY/ HR						
62 -A	AGGREGATE BASE STONE	Matl.	621.00	TON	10.50	6,521	
		Labor	0		0.00	0	6,521
63 -A	D-8 DOZER	Matl.	4.00	HRS	105.19	421	
		Labor	4	EQ	22.06	88	509
64 -A	CAT 16H MOTOR GRADER	Matl.	4.00	HRS	110.25	441	
		Labor	4	EQ	22.06	88	529
65 -A	COMPACTOR 825C	Matl.	4.00	HRS	123.61	494	
		Labor	4	EQ	22.06	88	582
66 -A	CAT CS-563 ROLLER	Matl.	4.00	HRS	39.75	159	
		Labor	4	EQ	22.06	88	247
67 -A	CAT 613 WATER WAGON (1/2 TIME)	Matl.	4.00	HRS	37.14	149	
		Labor	2	EQ	22.06	44	193
68 -A	CAT D400 ARTICULATED DUMP TRUCKS (3 EACH)	Matl.	4.00	HRS	302.66	1,211	
		Labor	12	EQ	22.06	265	1,476
69 -A	SPOTTER (2 EACH)	Matl.	4.00	HRS	0.00	0	
		Labor	8	L	19.45	156	156
70 -A	FOREMAN W/ TRUCK	Matl.	4.00	HRS	10.00	40	
		Labor	4	FO	30.00	120	160
****	SUBTOTAL ****	Matl.				11,884	
		Labor	63			1,385	13,269
71 -A	ALLOWANCE FOR DECON STATIONS FOR ACCESS TO CLEAN AREAS AFTER	Matl.	2.00	LOT	20,000.00	40,000	
		Labor	0		0.00	0	40,000

2250

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	CERTIFICATION						
****	SUBTOTAL ****	Matl.				40,000	
		Labor	0			0	40,000
72 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	1,568	ZZ	22.20	34,815	34,815
73 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	241	ZZ	22.20	5,351	5,351

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	316,985	174,054	491,039
TOTAL	316,985	(hrs. 7,839) 174,054	491,039

000280

WBS ..... 1.3.5.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.13 GENERAL REQUIREMENTS
Discipline ..... C CIVIL AND SITE
B/M Title ..... GENERAL REQUIREMENTS

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... J.SMITH
Trace Number C.5.13 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
1 -A	PORTABLE COOL DOWN TRAILER, SELF CONTAINED POWER AND COOLING (2 EACH)	Matl.	17.00	MTH	500.00	8,500	
		Labor	0		0.00	0	8,500
2 -A	GENERATOR FOR COOL DOWN TRAILERS (2 EACH)	Matl.	17.00	MTH	40.00	680	
		Labor	0		0.00	0	680
3 -A	PORTABLE OFFICE TRAILER	Matl.	17.00	MTH	600.00	10,200	
		Labor	0		0.00	0	10,200
4 -A	SAFETY ENGINEER FULL TIME	Matl.	17.00	MTH	0.00	0	
		Labor	3,689	SE	40.00	147,560	147,560
5 -A	FIELD ENGINEER FULL TIME (2 EACH)	Matl.	34.00	MTH	0.00	0	
		Labor	7,378	FE	40.00	295,120	295,120
6 -A	SUPERIENTENDENT FULL TIME	Matl.	17.00	MTH	0.00	0	
		Labor	3,689	SU	50.00	184,450	184,450
7 -A	SECRETARY	Matl.	17.00	MTH	0.00	0	
		Labor	2,941	S	12.00	35,292	35,292
8 -A	SCHEDULER	Matl.	17.00	MTH	0.00	0	
		Labor	3,689	SD	30.00	110,670	110,670
9 -A	ESTIMATOR	Matl.	17.00	MTH	0.00	0	
		Labor	2,941	ES	30.00	88,230	88,230
10 -A	HEALTH PHYSICS TECHNICIAN (2 EACH)	Matl.	34.00	MTH	0.00	0	
		Labor	7,378	HP	30.00	221,340	221,340
11 -A	PICKUP TRUCKS 4X4, 8 EACH	Matl.	17.00	MTH	4,800.00	81,600	
		Labor	0		0.00	0	81,600

000281

2250

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
12 -A	PHONE	Matl.	17.00	MTH	300.00	5,100	
		Labor	0		0.00	0	5,100
13 -A	MISC. OFFICE EQUIPMENT	Matl.	1.00	LOT	25,000.00	25,000	
		Labor	0		0.00	0	25,000

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	131,080	1,082,662	1,213,742
TOTAL	131,080	(hrs. 31,705) 1,082,662	1,213,742

000282

ACD - FORMER PLANT AREA

WBS ..... 1.3.5.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.14 *MOBILIZATION*
Discipline ..... C CIVIL AND SITE
B/M Title ..... MOBILIZATION

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.14 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	** PROJECT MOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	36.00	EA	4,000.00	144,000	
		Labor	0		0.00	0	144,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	2.00	EA	0.00	0	
		Labor	4	EQ	22.06	88	88
7 -A	FLAT BED TRUCK - 5 TON	Matl.	2.00	EA	0.00	0	
		Labor	4	EQ	22.06	88	88

000283

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	10.00	EA	0.00	0	
		Labor	20	EQ	22.06	441	441
9 -A	CAT 613C WATER WAGON	Matl.	4.00	EA	240.00	960	
		Labor	48	EQ	22.06	1,059	2,019
10 -A	CAT 988 FE LOADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	20.00	EA	1,000.00	20,000	
		Labor	0		0.00	0	20,000
12 -A	CAT D8 DOZER	Matl.	4.00	EA	120.00	480	
		Labor	16	EQ	22.06	353	833
13 -A	CAT 446 BACKHOE	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
14 -A	CAT 16H GRADER	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
15 -A	CAT 825C COMPACTOR	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
16 -A	CAT CS-563 ROLLER	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	8.00	EA	30.00	240	
		Labor	8	EQ	22.06	176	416

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	169,280	7,058	176,338
TOTAL	169,280	(hrs. 320) 7,058	176,338

WBS ..... 1.3.5.5 GENERAL REQUIREMENTS
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C5.15 DEMOBILIZATION
Discipline ..... C CIVIL AND SITE
B/M Title ..... DEMOBILIZATION

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GEN REQMNTS
Quantity Take-Off By ... RSF
Trace Number C.5.15 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	AREA 5						
	** PROJECT DEMOBILIZATION OF ALL EQUIPMENT REQUIRED FOR FOUNDATION & UTILITY REMOVAL, SOIL EXCAVATION, GROUND WATER CONTROL AND SITE PREPERATION ** COST INCLUDE DELIVERY AND SET-UP						
	INCLUDES ONE WINTER SHUTDOWN						
1 -A	CAT 345 TRACHOE (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	36.00	EA	4,000.00	144,000	
		Labor	0		0.00	0	144,000
	ATTACHMENTS (DELIVER & INSTALL):						
2 -A	GRAPPLE	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
3 -A	HOE RAM	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
4 -A	SHEARS	Matl.	8.00	EA	60.00	480	
		Labor	32	EQ	22.06	706	1,186
5 -A	JAW CRUSHER	Matl.	4.00	EA	60.00	240	
		Labor	16	EQ	22.06	353	593
6 -A	FLAT BED TRUCK - 2 1/2 TON	Matl.	2.00	EA	0.00	0	
		Labor	4	EQ	22.06	88	88
7 -A	FLAT BED TRUCK - 5 TON	Matl.	2.00	EA	0.00	0	
		Labor	4	EQ	22.06	88	88

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
8 -A	WATER TRUCK - 4000 GAL	Matl.	10.00	EA	0.00	0	
		Labor	20	EQ	22.06	441	441
9 -A	CAT 613C WATER WAGON	Matl.	4.00	EA	240.00	960	
		Labor	48	EQ	22.06	1,059	2,019
10 -A	CAT 988 FE LOADER	Matl.	4.00	EA	120.00	480	
		Labor	32	EQ	22.06	706	1,186
11 -A	CAT D400E ATRICULATED DUMP TRUCK (SUBCONTRACT PRICE BY EQUIPMENT SUPPLIER)	Matl.	20.00	EA	1,000.00	20,000	
		Labor	0		0.00	0	20,000
12 -A	CAT D8 DOZER	Matl.	4.00	EA	120.00	480	
		Labor	16	EQ	22.06	353	833
13 -A	CAT 446 BACKHOE	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
14 -A	CAT 16H GRADER	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
15 -A	CAT 825C COMPACTOR	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
16 -A	CAT CS-563 ROLLER	Matl.	2.00	EA	120.00	240	
		Labor	16	EQ	22.06	353	593
17 -A	TRACK DRILL	Matl.	2.00	EA	120.00	240	
		Labor	8	EQ	22.06	176	416
18 -A	AIR COMPRESSOR	Matl.	2.00	EA	120.00	240	
		Labor	4	EQ	22.06	88	328
19 -A	PRESSURE WASHER	Matl.	8.00	EA	30.00	240	
		Labor	8	EQ	22.06	176	416
	DECONTAMINATION OF EQUIPMENT BEFORE TRANSPORT OFF-SITE						
20 -A	DECON THROUGH FREE RELEASE WASH STATION	Matl.	130.00	PCS	100.00	13,000	
		Labor	1,560	L	19.45	30,342	43,342

ACD - FORMER PLANT AREA

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	182,280	37,400	219,680
TOTAL	182,280	(hrs. 1,880) 37,400	219,680

WBS ..... 1.3.6.1 SITE MAINT & EROSION CNTRL
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C4.06 SITE MAINTENANCE
Discipline ..... C CIVIL AND SITE
B/M Title ..... SITE MAINTENANCE

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Building/Area ..... SITE WIDE
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... SITE PREP
Quantity Take-Off By ... JLS
Trace Number C.4.6 0

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	POST CONSTRUCTION MAINTENANCE						
	EROSION CONTROL CREW						
	DURATION: ASSUME 1 YEAR BEYOND COMPLETION OF AREA 5						
	ASSUME 8 HRS/WK						
1 -A	5 TON FLATBED TRUCK	Matl.	48.00	MTH	1,280.00	61,440	
		Labor	1,536	TD	20.78	31,918	93,358
2 -A	CAT 446 BACKHOE	Matl.	48.00	MTH	603.20	28,954	
		Labor	1,536	EQ	22.06	33,884	62,838
3 -A	LABORERS	Matl.	48.00	MTH	0.00	0	
		Labor	3,072	L	19.45	59,750	59,750
4 -A	SILT FENCE W/ WOOD STAKES ASSUME 25% REPLACEMENT PER YEAR	Matl.	11,625.00	LF	0.95	11,044	
		Labor	198	L	19.45	3,851	14,895
5 -A	FOREMAN W/ PICKUP TRUCK	Matl.	48.00	MTH	320.00	15,360	
		Labor	1,536	FO	30.00	46,080	61,440
6 -A	RE-SEEDING (ASSUME 20% OF THE EXCAVATION AREA PER YEAR)	Matl.	1.00	ACRE	1,500.00	1,500	
		Labor	0		0.00	0	1,500
	MAINTAIN MAINTENANCE ROAD (ASSUME 1 WEEK PER MONTH)						

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
7 -A	CAT 16H MOTOR GRADER	Matl.	12.00	MTH	4,410.00	52,920	
		Labor	480	EQ	22.06	10,589	63,509
8 -A	CAT CS-563 ROLLER	Matl.	12.00	MTH	1,590.00	19,080	
		Labor	480	EQ	22.06	10,589	29,669
9 -A	DUMP TRUCK	Matl.	12.00	MTH	1,600.00	19,200	
		Labor	480	TD	20.78	9,974	29,174
10 -A	SPOTTER (2 EACH)	Matl.	12.00	MTH	0.00	0	
		Labor	960	L	19.45	18,672	18,672
11 -A	FOREMAN W/ TRUCK	Matl.	12.00	MTH	400.00	4,800	
		Labor	480	FO	30.00	14,400	19,200
12 -A	LOSS TIME PPE, TRANSPORT	Matl.	0.00		0.00	0	
		Labor	2,797	ZZ	22.28	62,322	62,322
13 -A	LOSS TIME HEAT STRESS	Matl.	0.00		0.00	0	
		Labor	430	ZZ	22.28	9,581	9,581

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	214,298	311,610	525,908
TOTAL	214,298	(hrs. 13,985) 311,610	525,908

ACD - FORMER PLANT AREA

WBS ..... 1.3.6.2 GROUNDWATER CONTROL
Cost Code ..... 6000 SPECIAL FACILITIES
Participant ..... 51 GENERAL CONSTRUCTION
Level of Estimate . P Planning/Feasibility Estimate
B/M Attribute ..... C3.06 GROUNDWATER CTRL MAINTENANCE
Discipline ..... C CIVIL AND SITE
B/M Title ..... GROUNDWATER CTRL MAINTENANCE

Building/Area 3A
Plant Site ..... F
Contracting Type ..... G General
Funding Type ..... LINE ITEM

Discipline Estimator ... GW CONTROL
Quantity Take-Off By ... CIVIL
Trace Number C.3.6 0

Cross-Cut Code ....
Standard Value File G:\60\AES\FDC.val
Estimate File ..... P:\60\7340.Est 5-17-99 9:04a

Expiration Date: 06/01/1999

Item	Description	MATL. / LABOR	Quantity / Hours	Unit / Craft	Unit Price / Rate	Total Material / Total Labor	Total Cost M + L
	POST CONSTRUCTION MAINTENANCE						
1 -A	REPLACEMENT OF PUMPS	Matl.	10.00	EA	0.00	0	
		Labor	0		0.00	0	0
2 -A	NEW HOSE	Matl.	1.00	LOT	500.00	500	
		Labor	0		0.00	0	500
	OPERATE PUMPS - ASSUME 1/4 TIME						
3 -A	OPERATOR (1/4 TIME)	Matl.	48.00	MTHS	70.00	3,360	
		Labor	2,064	EQ	22.06	45,532	48,892
4 -A	FLATBED TRUCK, 2-1/2 TON	Matl.	48.00	MTHS	500.00	24,000	
		Labor	2,064	TD	20.78	42,890	66,890

BILL OF MATERIAL SUMMARY	Material	Labor	Total Cost M + L
TOTAL DIRECT	27,860	88,422	116,282
TOTAL	27,860	(hrs. 4,128) 88,422	116,282

000291

Disciplines
A: ARCHITECTURAL
C: CIVIL AND SITE

Total Labor Hours: 544,937

COST SUMMARY

COST SUMMARY	Material	Labor	Total Cost M + L
Line Item Cost	21,371,917	13,924,956	35,296,873
Total Sales Tax	0		0
SUBTOTAL	21,371,917	13,924,956	35,296,873
Total Indirect	0	0	0
SUBTOTAL	21,371,917	13,924,956	35,296,873
Contingency	0	0	0
SUBTOTAL	21,371,917	13,924,956	35,296,873
Market Adjustment			0
TOTAL			35,296,873

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO.: 300-007340.01
DATE: 3-22-99
SUBJECT: OU3 RI/FS QUANTITY BREAKDOWN

1	2	3	4	5	6	7	8	9	10	11
EXCAVATION AREA	TOTAL OF UNBULKED VOLUME		ASPHALT	CLAY PIPING	CONCRETE	CONCRETE BEAMS	CONCRETE COLUMNS	CONCRETE FOUNDATION	CONCRETE SLABS	CONCRETE WALLS
3A	550435.893		0	2286.526	50894.1586	4402.2	1045.6	131309.624	241941.574	37285.22
3B	654566.936		0	1070.54	79115.576	0	0	46370.72	514376.72	4550.6
4A	1028593.88		0	1333.43	128031.7098	3780.6	1205.6	558906.766	289912.47	19553.18
4B	716864.829		0	1493.367	124430.7777	19835.5524	6936.454	138329.913	302620.856	33216.1288
5	515211.201		0	883.063	40704.916	29555.7898	12793.426	39696.376	199481.835	29088.398

	CONCRETE CY	ASPHALT CY	CLAY PIPE CY
3A	17291.7917	2156	84.68614815
3B	23867.171	2156	39.64962963
4A	37088.5306	2156	49.3862963
4B	23161.8401	2156	55.30988889
5	13011.8793	2156	32.70603704
TOTAL	114421.213	10780	32.70603704

	COMBINED CONCRETE CY	CONCRETE FROM G-002 ROADS CY	CONC TOTAL CY
3A	17292	3349	20641
3B	23867	3349	27216
4A	37089	3349	40438
4B	23162	3349	26511
5	13012	3349	16361

Project: ACD - Former Plant Area
Project No. 300-007340.01
Date: 04-29-99
Subject: Major quantities

Area No.	Soil Qty. (BCY) *	Abv. WAC Soil (BCY) **	Diversion Dike (FCY)	RCRA Soil (BCY) **	TCE Soil (BCY) ***	Conc Fdns (BCY) ****	Asphalt (BCY) *****	Clay Pipe (BCY) ******	Backfill (FCY) *******	Haul Roads (LF)
3A	168,575	4,345	685	24,750	300	20,641	2,156	85	245	830
3B	133,126	21,525	770	225	0	27,216	2,156	40	0	250
4A	150,355	7,225	25	0	0	40,438	2,156	49	15,840	1500
4B	744,702	10,000	375	225	0	26,511	2,156	55	14,483	700
5	48,423	0	680	0	0	16,361	2,156	33	0	200
Total	1,245,181	43,095	2,535	25,200	300	131,167	10,780	262	30,568	3480

* Qty. based on the 3-D model.
** Abv.-WAC and RCRA soil qty. based on area as shown on ACD figures at 3' deep.
*** TCE soil qty. provided by LGT design team.
**** Qty. based on OU3 RI/FS. Qtys. were calculated by bldg. by excavation area.
***** Qty. based on OU3 RI/FS. Assumed 20% for each area.
****** Qty. based on OU3 RI/FS. Assume this will be excavated w/ the general soil excavation.
******* Qty. based on the 3-D model.

000294

-2250

Project: ACD - Former Plant Area
Project No.: 300-007340.01
Date: 03-10-99
Subject: Job Factors Level C dressout

Work Day: 10 Hrs. per worker 10

	Start Shift	Break	Lunch	End Shift
Dressout (10 min.)	10	10	10	
Wait on shuttle (2 min. avg. each time)	2	4	4	2
Ride Shuttle (3 min. avg. each way)	3	6	6	3
Undress (5 min.)		5	5	5
Monitor (2 min.)		2	2	2
Break Time (10 min.)		10		
subtotal (minutes)	15	37	27	12
subtotal (hours= min./ 50 min. wk. Hr.)	0.3	0.74	0.54	0.24

Average Job Factor	Hours
Start Shift	0.3
Mid Morning Break	0.74
Lunch	0.54
Mid Afternoon Break	0.74
End of Shift	0.24
subtotal (Hours/ Day)	2.56
% Loss Time adder (2.4 hrs/ 10 hrs day)	26%

Project: ACD - Former Plant Area
Project No.: 300-007340.01
Date: 03-18-99
Subject: Job Factors Level C dressout - Modified for Abv-WAC & RCRA Areas

Work Day: 10 Hrs. per worker 10

	Start Shift	Break	Lunch	End Shift
Dressout (10 min.)	15	15	15	
Wait on shuttle (2 min. avg. each time)	2	4	4	2
Ride Shuttle (3 min. avg. each way)	3	6	6	3
Undress (5 min.)		10	10	10
Monitor (2 min.)		2	2	2
Break Time (10 min.)		10		
subtotal (minutes)	20	47	37	17
subtotal (hours= min./ 50 min. wk. Hr.)	0.4	0.94	0.74	0.34

Average Job Factor	Hours
Start Shift	0.4
Mid Morning Break	0.94
Lunch	0.74
Mid Afternoon Break	0.94
End of Shift	0.34
subtotal (Hours/ Day)	3.36

% Loss Time adder (2.4 hrs/ 10 hrs day) 34%

000296

Project: ACD - Former Plant Area
Project No.: 300-007340.01
DATE: 3-19-99
Subject: Equipment Rental Rates
Useage: Assume 160 hrs/month operation

EQUIPMENT	MONTHLY RATE	HOURLY RATE	FOG & FUEL	TIRES (WEAR & REPAIR)	TOTAL	2 EACH	3 EACH	4 EACH	5 EACH
CAT D-8 DOZER	$14,750	92.19	13.00		105.19	210.38	315.56	420.75	525.94
CAT D-9L DOZER	$19,500	121.88	14.36		136.24	272.47	408.71	544.94	681.18
CAT 637E SCRAPER	$34,000	212.50	24.39	21.87	258.76	517.52	776.28	1,035.04	1,293.80
CAT 416C BACKHOE	$1,950	12.19	2.22	0.63	15.04	30.08	45.11	60.15	75.19
CAT 16H GRADER	$16,000	100.00	8.00	2.25	110.25	220.50	330.75	441.00	551.25
CAT 613C WATER WAGON	$8,000	50.00	13.44	10.83	74.27	148.54	222.81	297.08	371.35
CAT CS-563 ROLLER	$5,100	31.88	7.23	0.64	39.75	79.49	119.24	158.98	198.73
CAT 825C COMPACTOR	$18,000	112.50	11.11		123.61	247.22	370.83	494.44	618.05
CAT RM-350 SOIL STABILIZER	$17,000	106.25	13.00		119.25	238.50	357.75	477.00	596.25
CAT 988 FRONT END LOADER	$19,750	123.44	10.67	11.65	145.76	291.52	437.27	583.03	728.79
CAT 95 CHALLENGER	$10,000	62.50	5.63		68.13	136.26	204.39	272.52	340.65
CAT 345 BL EXCAVATOR	$11,000	68.75	8.22		76.97	153.94	230.91	307.88	384.85
CAT 446 BACKHOE	$2,450	15.31	2.81	0.73	18.85	37.71	56.56	75.41	94.26
CAT D-4H/D-5M DOZER	$4,275	26.72	3.69		30.41	60.82	91.23	121.64	152.04
CAT D-5H/D-6M DOZER	$5,475	34.22	4.25		38.47	76.94	115.41	153.88	192.34
CAT D-6R LGP DOZER	$8,400	52.50	5.43		57.93	115.86	173.79	231.72	289.65

Project: ACD - Former Plant Area
Project No.: 300-007340.01
DATE: 3-19-99
Subject: Equipment Rental Rates
Useage: Assume 160 hrs/month operation

EQUIPMENT	MONTHLY RATE	HOURLY RATE	FOG & FUEL	TIRES (WEAR & REPAIR)	TOTAL	2 EACH	3 EACH	4 EACH	5 EACH
CAT D-6R XL DOZER	$7,950	49.69	5.43		55.12	110.24	165.35	220.47	275.59
CAT 623-F SCRAPER	$22,500	140.63	13.44	10.83	164.90	329.79	494.69	659.58	824.48
CAT 631-E SCRAPER	$24,000	150.00	14.78	16.48	181.26	362.52	543.78	725.04	906.30
CAT D400-E TRUCKS	$12,500	78.13	8.43	14.33	100.89	201.77	302.66	403.54	504.43
CAT 14-H GRADER	$10,250	64.06	6.56	1.85	72.47	144.95	217.42	289.89	362.36
CAT 950-G F.E. LOADER	$6,650	41.56	5.73	3.74	51.03	102.07	153.10	204.13	255.16
CAT 966-F F.E. LOADER	$9,900	61.88	7.74	6.94	76.56	153.11	229.67	306.22	382.78
CAT CHALLENGER 55 W/ DISC HARROW	$7,550	47.19	2.22		49.41	98.82	148.22	197.63	247.04
GROVE RT-530 DXL 30 TON ALL TERRAIN CRANE	$6,000	37.50	2.22	0.63	40.35	80.70	121.05	161.40	201.75
GROVE RT-635 C 35 TON ALL TERRAIN CRANE	$6,700	41.88	2.22	0.63	44.73	89.45	134.18	178.90	223.63
INGERSOLL - RAND ECM 350/ VL671 AIR TRACK DRILL, 900 CFM	$3,534	22.09			22.09	44.18	66.27	88.36	110.45
AIR COMPRESSOR ROTARY SCREW, 260 HP, 900 CFM	$3,674	22.96	2.00		24.96	49.92	74.88	99.84	124.80
ROLL-OFF TRANSPORT	$7,800	48.75	11.87		60.62	121.24	181.86	242.48	303.10

Project: ACD - Former Plant Area
Project No.: 300-007340.01
DATE: 3-19-99
Subject: Equipment Rental Rates
Useage: Assume 160 hrs/month operation

EQUIPMENT	MONTHLY RATE	HOURLY RATE	FOG & FUEL	TIRES (WEAR & REPAIR)	TOTAL	2 EACH	3 EACH	4 EACH	5 EACH
TRUCK, 64,000 GVW									
CAT CP-323 VIBRATORY COMPACTOR	$6,100	38.13	10.50		48.63	97.25	145.88	194.50	243.13
WATER TRUCK, 4000 GAL W/ CANNON & HOSE	$2,500	15.63	9.30		24.93	49.85	74.78	99.70	124.63
SHEAR LABOUNTY MS 140R	$8,536	53.35			53.35	106.70	160.05	213.40	266.75
ROTATING GRAPPLE LABOUNTY 120R	$2,066	12.91			12.91	25.82	38.73	51.64	64.55
JAW CRUSHER LABOUNTY UP90	$5,424	33.90			33.90	67.80	101.70	135.60	169.50
HOE RAM LABOUNTY CP160	$3,685	23.03			23.03	46.06	69.09	92.12	115.15

Project: ACD - Former Plant Area
Project No. 300-007340.01
Date: 03-11-99
Subject: Haul Distances (Round Trips)

Area	WBS	OSDF	Abv. WAC Stockpile	Roll-Off Staging
3A	1.3.1	7000'	5000'	9000'
3B	1.3.2	9000'	3000'	12000'
4A	1.3.3	7000'	10000'	3000'
4B	1.3.4	10000'	7000'	7000'
5	1.3.5	12000'	13000'	3000'

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 3000S
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCK
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: SOIL
LENTGH OF HAUL (ROUND TRIP): 3000 LF
ASSUMPTION: TRUCKS WILL NOT BE DECONNED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
3000 LF/ (88 FT/ MIN. X 15 MPH) = 2.3 MIN.

CYCLE TIME

TRAVEL TIME =	2.3 MINUTES
LOAD TIME =	1.7 MINUTES
DUMP TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	5.6 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 5.6 MIN. = 8.6 LOADS/ HR

CY PER HOUR
8.6 LDS./ HR X 21 STRUCK CY/ LOAD / 1.25 SWELL = 145 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	145 BCY/ HR
TWO HAUL UNITS =	290 BCY/ HR
THREE HAUL UNITS =	435 BCY/ HR
FOUR HAUL UNITS =	580 BCY/ HR
FIVE HAUL UNITS =	725 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 5000S
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCK
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: SOIL
LENTGH OF HAUL (ROUND TRIP): 5000 LF
ASSUMPTION: TRUCKS WILL NOT BE DECONNED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
5000 LF/ (88 FT/ MIN. X 15 MPH) = 3.8 MIN.

CYCLE TIME

TRAVEL TIME =	3.8 MINUTES
LOAD TIME =	1.7 MINUTES
DUMP TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	7.1 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 7.1 MIN. = 6.8 LOADS/ HR

CY PER HOUR
6.8 LDS./ HR X 21 STRUCK CY/ LOAD / 1.25 SWELL = 114 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	114 BCY/ HR
TWO HAUL UNITS =	228 BCY/ HR
THREE HAUL UNITS =	342 BCY/ HR
FOUR HAUL UNITS =	456 BCY/ HR
FIVE HAUL UNITS =	570 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 7000S
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCK
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: SOIL
LENTGH OF HAUL (ROUND TRIP): 7000 LF
ASSUMPTION: TRUCKS WILL NOT BE DECONNED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
7000 LF/ (88 FT/ MIN. X 15 MPH) = 5.3 MIN.

CYCLE TIME

TRAVEL TIME =	5.3 MINUTES
LOAD TIME =	1.7 MINUTES
DUMP TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	8.6 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 8.6 MIN. = 5.6 LOADS/ HR

CY PER HOUR
5.6 LDS./ HR X 21 STRUCK CY/ LOAD / 1.25 SWELL = 94 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	94 BCY/ HR
TWO HAUL UNITS =	188 BCY/ HR
THREE HAUL UNITS =	282 BCY/ HR
FOUR HAUL UNITS =	376 BCY/ HR
FIVE HAUL UNITS =	470 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 9000S
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCK
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: SOIL
LENTGH OF HAUL (ROUND TRIP): 9000 LF
ASSUMPTION: TRUCKS WILL NOT BE DECONNED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
9000 LF/ (88 FT/ MIN. X 15 MPH) = 6.8 MIN.

CYCLE TIME

TRAVEL TIME =	6.8 MINUTES
LOAD TIME =	1.7 MINUTES
DUMP TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	10.1 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 10.1 MIN. = 4.8 LOADS/ HR

CY PER HOUR
4.8 LDS./ HR X 21 STRUCK CY/ LOAD / 1.25 SWELL = 81 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	81 BCY/ HR
TWO HAUL UNITS =	162 BCY/ HR
THREE HAUL UNITS =	243 BCY/ HR
FOUR HAUL UNITS =	324 BCY/ HR
FIVE HAUL UNITS =	405 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 10000S
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCK
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: SOIL
LENTGH OF HAUL (ROUND TRIP): 10000 LF
ASSUMPTION: TRUCKS WILL NOT BE DECONNED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
10000 LF/ (88 FT/ MIN. X 15 MPH) = 7.6 MIN.

CYCLE TIME

TRAVEL TIME =	7.6 MINUTES
LOAD TIME =	1.7 MINUTES
DUMP TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	10.9 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 10.9 MIN. = 4.4 LOADS/ HR

CY PER HOUR
4.4 LDS./ HR X 21 STRUCK CY/ LOAD / 1.25 SWELL = 74 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	74 BCY/ HR
TWO HAUL UNITS =	148 BCY/ HR
THREE HAUL UNITS =	222 BCY/ HR
FOUR HAUL UNITS =	296 BCY/ HR
FIVE HAUL UNITS =	370 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 12000S
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCK
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: SOIL
LENTGH OF HAUL (ROUND TRIP): 12000 LF
ASSUMPTION: TRUCKS WILL NOT BE DECONNED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
12000 LF/ (88 FT/ MIN. X 15 MPH) = 9.1 MIN.

CYCLE TIME

TRAVEL TIME =	9.1 MINUTES
LOAD TIME =	1.7 MINUTES
DUMP TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	12.4 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 12.4 MIN. = 3.9 LOADS/ HR

CY PER HOUR
3.9 LDS./ HR X 21 STRUCK CY/ LOAD / 1.25 SWELL = 66 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	66 BCY/ HR
TWO HAUL UNITS =	132 BCY/ HR
THREE HAUL UNITS =	198 BCY/ HR
FOUR HAUL UNITS =	264 BCY/ HR
FIVE HAUL UNITS =	330 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 13000S
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCK
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: SOIL
LENTGH OF HAUL (ROUND TRIP): 13000 LF
ASSUMPTION: TRUCKS WILL NOT BE DECONNED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
13000 LF/ (88 FT/ MIN. X 15 MPH) = 9.8 MIN.

CYCLE TIME

TRAVEL TIME =	9.8 MINUTES
LOAD TIME =	1.7 MINUTES
DUMP TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	13.1 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 13.1 MIN. = 3.7 LOADS/ HR

CY PER HOUR
3.7 LDS./ HR X 21 STRUCK CY/ LOAD / 1.25 SWELL = 62 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	62 BCY/ HR
TWO HAUL UNITS =	124 BCY/ HR
THREE HAUL UNITS =	186 BCY/ HR
FOUR HAUL UNITS =	248 BCY/ HR
FIVE HAUL UNITS =	310 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 2000C
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCKS
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: CONCRETE RUBBLE
LENTGH OF HAUL (ROUND TRIP): 2000 LF
ASSUMPTION: HAUL TRUCKS WILL NOT BE DECONED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
2000 LF/ (88 FT/ MIN. X 15 MPH) = 1.5 MIN.

CYCLE TIME

TRAVEL TIME =	1.5 MINUTES
LOAD TIME =	1.7 MINUTES
UNLOAD TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	4.8 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 4.8 MIN. = 10 LOADS/ HR

CY PER HOUR
10 LDS./ HR X 28 HEAPED CY/ LOAD / 1.5 SWELL = 187 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	187 BCY/ HR
TWO HAUL UNITS =	374 BCY/ HR
THREE HAUL UNITS =	561 BCY/ HR
FOUR HAUL UNITS =	748 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 3000C
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCKS
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: CONCRETE RUBBLE
LENTGH OF HAUL (ROUND TRIP): 3000 LF
ASSUMPTION: HAUL TRUCKS WILL NOT BE DECONED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
3000 LF/ (88 FT/ MIN. X 15 MPH) = 2.3 MIN.

CYCLE TIME

TRAVEL TIME =	2.3 MINUTES
LOAD TIME =	1.7 MINUTES
UNLOAD TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	5.6 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 5.6 MIN. = 8.6 LOADS/ HR

CY PER HOUR
8.6 LDS./ HR X 28 HEAPED CY/ LOAD / 1.5 SWELL = 161 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	161 BCY/ HR
TWO HAUL UNITS =	322 BCY/ HR
THREE HAUL UNITS =	483 BCY/ HR
FOUR HAUL UNITS =	644 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 5000C
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCKS
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: CONCRETE RUBBLE
LENTGH OF HAUL (ROUND TRIP): 5000 LF
ASSUMPTION: HAUL TRUCKS WILL NOT BE DECONED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
5000 LF/ (88 FT/ MIN. X 15 MPH) = 3.8 MIN.

CYCLE TIME

TRAVEL TIME =	3.8 MINUTES
LOAD TIME =	1.7 MINUTES
UNLOAD TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	7.1 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 7.1 MIN. = 6.8 LOADS/ HR

CY PER HOUR
6.8 LDS./ HR X 28 HEAPED CY/ LOAD / 1.5 SWELL = 127 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	127 BCY/ HR
TWO HAUL UNITS =	254 BCY/ HR
THREE HAUL UNITS =	381 BCY/ HR
FOUR HAUL UNITS =	508 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 7000C
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCKS
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: CONCRETE RUBBLE
LENTGH OF HAUL (ROUND TRIP): 7000 LF
ASSUMPTION: HAUL TRUCKS WILL NOT BE DECONED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
7000 LF/ (88 FT/ MIN. X 15 MPH) = 5.3 MIN.

CYCLE TIME

TRAVEL TIME =	5.3 MINUTES
LOAD TIME =	1.7 MINUTES
UNLOAD TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	8.6 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 8.6 MIN. = 5.6 LOADS/ HR

CY PER HOUR
5.6 LDS./ HR X 28 HEAPED CY/ LOAD / 1.5 SWELL = 105 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	105 BCY/ HR
TWO HAUL UNITS =	210 BCY/ HR
THREE HAUL UNITS =	315 BCY/ HR
FOUR HAUL UNITS =	420 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 9000C
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCKS
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: CONCRETE RUBBLE
LENTGH OF HAUL (ROUND TRIP): 9000 LF
ASSUMPTION: HAUL TRUCKS WILL NOT BE DECONED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
9000 LF/ (88 FT/ MIN. X 15 MPH) = 6.8 MIN.

CYCLE TIME

TRAVEL TIME =	6.8 MINUTES
LOAD TIME =	1.7 MINUTES
UNLOAD TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	10.1 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 10.1 MIN. = 4.8 LOADS/ HR

CY PER HOUR
4.8 LDS./ HR X 28 HEAPED CY/ LOAD / 1.5 SWELL = 90 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	90 BCY/ HR
TWO HAUL UNITS =	180 BCY/ HR
THREE HAUL UNITS =	270 BCY/ HR
FOUR HAUL UNITS =	360 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 10000C
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCKS
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: CONCRETE RUBBLE
LENTGH OF HAUL (ROUND TRIP): 10000 LF
ASSUMPTION: HAUL TRUCKS WILL NOT BE DECONED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
10000 LF/ (88 FT/ MIN. X 15 MPH) = 7.6 MIN.

CYCLE TIME

TRAVEL TIME =	7.6 MINUTES
LOAD TIME =	1.7 MINUTES
UNLOAD TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	10.9 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 10.9 MIN. = 4.4 LOADS/ HR

CY PER HOUR
4.4 LDS./ HR X 28 HEAPED CY/ LOAD / 1.5 SWELL = 82 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	82 BCY/ HR
TWO HAUL UNITS =	164 BCY/ HR
THREE HAUL UNITS =	246 BCY/ HR
FOUR HAUL UNITS =	328 BCY/ HR

000311

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 12000C
HAULING PRODUCTION RATES USING CAT D400E ARTICULATED DUMP TRUCKS
HEAPED CAPACITY: 28.8 CY
STRUCK CAPACITY: 21.6 CY
MATERIAL: CONCRETE RUBBLE
LENTGH OF HAUL (ROUND TRIP): 12000 LF
ASSUMPTION: HAUL TRUCKS WILL NOT BE DECONED

TRAVEL TIME = DISTANCE (LF)/ (88 FT/MIN. X AVG SPEED (MPH))
12000 LF/ (88 FT/ MIN. X 15 MPH) = 9.1 MIN.

CYCLE TIME

TRAVEL TIME =	9.1 MINUTES
LOAD TIME =	1.7 MINUTES
UNLOAD TIME =	1.3 MINUTES
SPOT & DELAY =	0.3 MINUTES
TOTAL	12.4 MINUTES

LOADS PER HOUR USING 50 MIN. WORK HOUR
(50 MIN./ HR X PROD. FACTOR (BASED ON AGE))/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 12.4 MIN. = 3.9 LOADS/ HR

CY PER HOUR
3.9 LDS./ HR X 28 HEAPED CY/ LOAD / 1.5 SWELL = 73 BCY

PRODUCTION SUMMARY

ONE HAUL UNIT =	73 BCY/ HR
TWO HAUL UNITS =	146 BCY/ HR
THREE HAUL UNITS =	219 BCY/ HR
FOUR HAUL UNITS =	292 BCY/ HR

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 1E
EXCAVATOR PRODUCTION RATES USING CAT 245D TRACHOE W/ 3.5 CY BUCKET
MATERIAL: SOIL
CONDITIONS: AVERAGE

REFERENCE EARTHMOVING EQUIPMENT PRODUCTION RATES AND COSTS FOR THE FOLLOWING INFORMATION.

FROM PAGE 1-53 THE CYCLE TIME ESTIMATING CHART SHOWS THE AVERAGE CYCLE TIME FOR A 245D IS .52 MINUTES.

THEN FROM PAGE 1-55, TABLE 1-18 EXCAVATOR PRODUCTION TABLE (LCY/ 60 MIN. HR) THE ESTIMATED PRODUCTION USING .52 MIN. CYCLE TIME AND A 3.5 CY BUCKET IS 437 LCY.

CONVERT TO 50 HOUR WORK WEEK & .75 PRODUCTIVITY FACTOR
437 LCY/ HR / 60 MIN./HR X 50 MIN./ HR X .75 = 273 LCY

SOIL: 273 LCY/ HR / 1.25 SWELL FACTOR = 218 BCY

CONCRETE: 273 LCY/ HR / 1.5 SWELL FACTOR = 182 BCY

000313

PROJECT: ACD - FORMER PLANT AREA
PROJECT NO. 300-007340.01

WORKSHEET: 1L
LOADER PRODUCTION RATES USING 988 F.E. LOADER W/ 7 CY BUCKET
MATERIAL: SOIL & CONCRETE
CONDITIONS: AVERAGE

BASIC CYCLE TIME (FROM MANUAL) = .60 MIN.

LOADER CYCLES PER HOUR USING A 50 MINUTE WORK HOUR
(50 MIN./ HR X PRODUCTIVITY FACTOR)/ CYCLE TIME (MIN.)
(50 MIN./ HR X .96)/ 0.60 MIN. = 80 CYCLES/ HR

SOIL: LOADER PRODUCTION
80 CYCLES/ HR X 7 LCY/ CYCLE / 1.25 SWELL FACTOR = 448 BCY/ HR

SOIL: PRODUCTION SUMMARY

ONE LOADER =	448 BCY/ HR
TWO LOADERS =	896 BCY/ HR

CONCRETE: LOADER PRODUCTION
80 CYCLES/ HR X 7 LCY/ CYCLE / 1.5 SWELL FACTOR = 373 BCY/ HR

CONCRETE: PRODUCTION SUMMARY

ONE LOADER =	373 BCY/ HR
TWO LOADERS =	746 BCY/ HR