Engineering \ Document Change Notice

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WPRAP Remedial Design Package, Volume 2 of 3, Excavation Plan, Rev. 0, 8/25/98

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ECN _____ DCN - X	Class 1 ___ (PCP Req'd) Class 2 ___ (PCP Req'd) Class 3 X (Minor Mod)	**DCN 1103**	Page 1 of 18

Reason for Change:

Changes to TOC (page iv) and changes to pages 38, 39,40,41,42,44,45,46,47,48,49,50 are just changes to pagination necessitated by sentences added to sections 4.4 and 4.5.

Changes to sections 4.8 and 5.1.5 (pages 43 & 52):
Waste pit material has proven to be sufficiently moist that dust generation from the truck's load during transit from the pits to the Material Handling Building (process area) can normally be controlled without covering the bed of the haul truck. These sections have been revised to require use of covers/tarps only if the use of dust suppression agent (usually water mist) isn't effective in preventing generation of visible dust from the truck's load during transit.

Changes to sections 4.4 and 4.5(pages 36 & 37):
A new paragraph was added to each of these sections to incorporate corrective actions for Fluor commitments no. 1093, 1094 & 1095 relative to AEDO Log No. 01-12-869.

Description of Change:

Replace pages iv, 36 through 50 and page 52 with replacement pages contained in this DCN. The following changes have been made:

1. The following sentence from section 4.8 (page 43) is deleted:
   "The truck beds will also be equipped with automatic/retractable covers to prevent spillage, dispersion and blowing of debris.".
2. The following sentences from section 5.1.5 (page 52) are deleted:
   "These potential emissions will be controlled by covering all truck beds hauling excavated materials. The articulating dump trucks will be equipped with automatic/retractable covers over their beds."
3. A new paragraph has been added to section 4.4 (page 36).
4. A new paragraph has been added to section 4.5 (page 37).

Document Title:	Document No.	Rev. No. 0
WPRAP Remedial Design Package, Volume 2 of 3, Excavation Plan	NONE	Rev. Date: 8/25/98

Is This Change.....	Safety Related ___ Configuration ___ Administrative X	Permanent X Temporary ___ Expiration Date:	Required Approvals: Lead Proj. Engr. X P.E. ___

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Approved By:	(Lead Proj. Engr.)	Date : 02/22/02
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4.4 Equipment Access

Access to the pits will be via haul roads constructed along the pit berms between the truck wash facility and the various waste pits areas at the locations shown on the phase drawings (Appendix B). Ramps from these haul roads to the bottom of the waste pits will be constructed by cutting the berm along the alignments shown on the phase drawings. Ramp construction will commence once a 15- to 20-foot thick (more, if possible) layer of waste over the proposed ramp location has been excavated. The upper portion of the ramp from the top of the berm to the bottom of the 15- to 20-foot deep excavation will then be constructed. This portion of the ramp will be used by the equipment as the waste excavation proceeds. The lower portion of the ramp will be constructed concurrently with the waste pit excavation.

Once a sufficient quantity of material has been removed from the waste pit, the truck turnaround area will also be constructed to complete the ramp installation. At the lower end of the ramp, an area 60 feet in diameter will be constructed to permit the articulating dump trucks to turn around. This turnaround area will be constructed using the pit cover soil. The top of this turn around area will be 10 feet higher than the bottom elevation of the waste pit.

Haul roads and ramps will be constructed with grades not to exceed 12 percent. Haul roads and ramps will be 20 feet wide and their surfaces will consist of a layer of geotextile and a 6-inch layer of gravel. Additional aggregate road base will be added, as necessary, based on field conditions and use.

In addition, reusable landing mat-type roadbeds may be used along the pit bottom to provide a stable roadbed or working platform for trucks and excavating equipment. These metal or fiberglass mesh sheets are interlocking and can be quickly placed. They can easily be washed off and relocated to create temporary roadbeds.

The haul road and ramp widths were determined by multiplying the largest vehicle width by 2, or by adding 2 feet to each side of the widest vehicle, whichever is greater. In this case, the proposed articulating dump trucks have a width of approximately 9 feet; therefore, the proposed 20-foot wide haul roads and ramps will be adequate. The haul roads and ramps will be designed by a competent person qualified in structural design and will be constructed in accordance with the design.

In order to prevent flooding or miring of equipment during or after periods of high rainfall and/or excessive ponding of water, equipment should be kept out of areas of deep water as much as practicable. In such conditions, equipment should be operated with caution, under the direction of the competent person, in order to avoid causing sloughing of water saturated excavation faces.

4.5 Excavation

With the exception of Waste Pit No. 3 and the Clearwell, the excavation of the waste pits will proceed in two phases: Neat Line Excavation and Directed Excavation. Neat line excavation will involve the removal of material to the pit bottom which includes the cap, waste material, and the pit liner material. Directed excavation will be concerned with the removal of soil below the pit bottom as directed by FDF. Waste Pit Nos. 1,2,4,5, and 6 are constructed on top of relatively low permeability soil barriers (consisting of native glacial till or placed common fill) between the respective pit liners and the GMA. These soil barriers typically range in thickness from 5 to 15 feet,

and will act to reduce the possible infiltration of storm water into the GMA while also serving to prevent incidental contact between the excavation equipment and the GMA.

However, for Waste Pit No. 3 and the Clearwell, neatline excavation will be handled differently due to the relatively thin soil liners and the proximity of these liners to the GMA. Neatline excavation of Waste Pit No. 3 and the Clearwell will involve the complete removal of cover and waste materials while initially leaving the soil liners in place. The soil liner will then be removed concurrently with approximately one foot of the underlying subsoils in an effort to ensure the utmost protection of the GMA, as detailed in Sections 4.5.1 and 4.5.2 which follow.

The excavation operations will allow for separate handling and transfer (to the Material Handling Building) for drier wastes and soils and also for debris encountered in the pits. Inside the Material Handling Building, the drier materials will be blended with the wetter material to improve handleability.

Due to the heterogeneity of the waste pits, minor field adjustments to this plan will be implemented to assure the execution of the work remains consistent with the concepts of the design.

As practicable, sufficient cap material should be maintained over excavation faces as a barrier to protect the underlying waste pit material from excessive water intrusion which might contribute to undesirable sloughing of material from the excavation face.

4.5.1 Neat Line Excavation

For Waste Pit Nos. 1,2,4,5, and 6 the neatline excavation will include removing the covers and waste materials down to the point where the respective liners (soil or EPDM) are visible. Elevation controls will be used to guide the excavations such that the equipment operators will be kept informed of the working excavation elevation at all times. As the excavation approaches the given design elevation of the liners, smaller cuts (i.e., less depth) will be made until the liners are visibly located or the given design elevations of the respective liners are reached.

Once the liner (or liner design elevation) is reached, excavation of the waste materials will proceed laterally along the top elevation of the liner (or liner design elevation) until a suitable working surface area is established. A suitable working surface area will basically consist of a suitable subgrade with adequate reach to both the forward excavation working face, and the liner material, previously exposed. For Waste Pit Nos. 1,2, and 4, the liner materials will be utilized to construct storm water segregation berms between contact storm water (falling within an active, disturbed excavation area of the waste) and non-contact storm water (falling in an area already excavated to subsoil elevation). These storm water segregation berms will be removed, along with applicable portions of the soil liners, as the excavation work progresses laterally. New segregation berms will then be constructed out of and on top of the liner material at the back edge of the working area, with the excavation proceeding in this manner until the pit waste and liner have been removed. Directed excavation will then proceed to remove additionally contaminated subsoils.

For Waste Pit Nos. 5 and 6, the neatline excavation is identical to the manner described above, with the exception that the storm water segregation berms will be constructed entirely of subsoils since the EPDM liners will have been removed.

The potential for penetration into the GMA will be minimized through initiation of proper elevation control at all times. Waste Pit Nos. 1,2,4,5, and 6 have adequate native soil (relatively low permeability glacial till) and/or common fill between the liner bottoms and the aquifer layer so as to avoid direct cross contamination of the aquifer by the construction equipment during excavation activities. Based on waste pit construction records, and the known thickness of the glacial overburden in the Waste Storage Area, these soil layers are expected to range between 5 and 15 feet in depth, as given in Figure 2-2 of the Design Criteria and assumptions section of this RDP. Liner breaches during the neatline excavation phase (cover, waste, and liner) should not pose a significant risk of contamination to the GMA from infiltration as the low permeability till would act to restrict flow into the GMA.

Waste Pit No. 3 and the Clearwell appear to be constructed directly on top of the GMA. Based on construction records for these two pits, thin, low permeability clay liners are currently in place to separate the wastes and the GMA. Though the integrity of these thin soil liners as they currently exist is unknown, best efforts will be made during the neatline excavation phase for these pits to leave the existing clay liners in place until all of the waste materials have been removed.

However, since these liners are constructed of clay, there exists a likelihood that a certain amount of waste materials will remain within the cracks and uneven interim surface of the exposed clay liners, which is typical when excavating cohesive soils. Additionally, due to thin depth of these clay liners, corresponding concerns arise such as dessication and degradation resulting from the clay liners being exposed to the atmosphere (sun, wind, rain, etc.) for an extended period of time prior to their excavation. Re-entering the pit bottom with construction equipment could then pose a breaching concern. For these reasons, and in order to ensure that the wastes and liner are completely removed, the remaining Waste Pit No. 3 and Clearwell clay liners will be removed concurrently with approximately one (1) foot of the underlying subsoils, as the final part of the waste pit excavation (i.e. prior to directed excavation).

Excavation of these clay liner materials will proceed laterally across the pit bottoms. Liner/subsoil materials (as discussed above) will be utilized to construct storm water segregation berms between contact storm water (falling within the liner area) and non-contact storm water (falling within the exposed subsoils area). These storm water segregation berms will be constructed during the liner excavation similar to the method described for the excavation of the other pits. Following liner removal, directed excavation will then proceed to remove contaminated subsoils.

For excavation activities within all of the pits, pumping of storm water will be a priority, both in the cover/waste/liner excavation and in the exposed subsoil portion of the pits as the excavation progresses, in order to reduce the amount of possible infiltration into the underlying GMA.

In general, an excavator will be used to initially excavate from on top of the waste soil cover on Waste Pit Nos. 1, 2, 3, and 4 to a maximum possible depth with stable sideslopes. Initial excavation of Waste Pit Nos. 5 and 6 and the Clearwell will commence from the berms using the long-reach excavator. This initial operation will strip 15 to 20 feet (more, if possible) of soil cover and waste. The material will be loaded into dump trucks and transported to the Material Handling Building.

Prior to the excavation of Waste Pit Nos. 5 and 6, the supernatant within these pits will be pumped to the Clearwell for subsequent treatment by the WTS. The existing surfaces will then be sprayed with Poly-Shell (or equivalent). Poly-Shell is a mixture of fly ash and shredded plastic that creates a thin, lightweight erosion and water resistant barrier that will also provide dust and erosion control.

If perched water is encountered during the excavation operation, low points will be graded in the pits to create sumps for excavation water collection. Sump pumps will be used to remove the collected water. Caution will be taken near the bottom of the waste pit so that sumps are not excavated prematurely through the pit liner or into the top of the GMA. As discussed previously, surveyed elevation controls will be utilized to guide the waste pit excavation such that the equipment operators will be kept informed of their working elevation at all times. As the excavation approaches the anticipated liner elevation, smaller cuts will be made until the liner is located or the design elevation of the liner is reached. Also, as the excavations progress with Waste Pit Nos. 5 and 6, the existing EPDM liners will be removed as they are encountered.

Once an area measuring roughly 50 feet by 50 feet has been excavated to an approximate depth of 15 to 20 feet, the excavation operation will be altered to remove the remaining waste material from the pit bottom. Direct loadout of the waste by the excavator into the truck will occur when access permits. Otherwise, a bulldozer will be used to push waste material so that an excavator can load dump trucks that will transport this material to the Material Handling Building.

Upon completion of the neat line excavation and prior to initiating the directed excavation, soil sampling will be performed as described in the following section.

4.5.2 Directed Excavation

This phase of excavation will be directed by FDF in lifts not less than 6 inches in depth. The subsoil excavation will be performed as directed using bulldozer(s) to push the materials to the end of the ramp. At this location the excavator will be staged to load this material into the dump trucks for transport to the Material Handling Building until such time that FDF determines that the constituent levels in the soils show that the soils meet the OSDF WAC. Soils which meet the OSDF WAC will be transported to the transfer point for staging for eventual transport to disposal in the OSDF.

The depth of the excavation, and the final disposition of the excavated soils, will be based on the data from field screening activities performed by FDF in accordance with the FDF sampling and analysis plan. Field screening techniques will cover one acre per day when mobile equipment is used and one acre per week when a high-purity Germanium detector is used.

Once field screening indicates that the final remediation levels (FRL) are met, FDF will collect samples for laboratory analyses, in accordance with the FDF sampling and analysis plan, to certify that the FRLs have been met. Turnaround time for laboratory sample and analysis, report preparation, and data review by the EPA may require a six-month period of time. If it is determined that the FRLs have not been attained, additional excavation will be directed until FRLs are attained.

During the directed excavation activities, storm water, emissions, and dust controls will be maintained.

4.6 Material Separation and Handling

As the excavation of the various waste pits and the Clearwell progresses, initial material separation activities will be conducted within the limits of the excavation to reasonably identify and segregate processable, non-processable, and non-typical wastes. These activities will be performed using the excavating equipment to the maximum extent practical, thereby minimizing the need for personnel exposure and manual waste handling. It is anticipated that personnel will primarily be used to visually inspect the contents of the excavation spoil and working face while performing minimal manual sorting activities.

4.6.1 Processable Wastes

Processable wastes are those waste materials which are less than 4 inches in size, or can be reasonably size-reduced to less than 4 inches, and are not classified as non-typical. These materials will be removed using low ground pressure (LGP) bulldozers, a track mounted excavator, a track mounted loader, and articulating dump trucks.

In order to provide an early assessment of the condition (extremely wet or dry) of the excavated materials, the working face of the excavation and the spoil being staged for loadout will be visually inspected by site personnel. Personnel will also ascertain if large quantities of non-processable or non-typical wastes are being encountered so that the appropriate procedures for handling these materials are instituted in a timely manner.

Processable wastes which appear to be relatively dry will be loaded directly onto dump trucks for transport to the Material Handling Building. Materials identified as being wet may either be loaded onto trucks for subsequent blending at the Material Handling Building, or placed in a segregating and loading area within Waste Pit Nos. 1, 2, 3 and 4. This area will be constructed of recompacted cover soils removed within the limits of excavation during the various phases. The area will be sloped to promote drainage of the wastes. The area is located along the base of the excavations to aid in preventing wind dispersion and potential retransport of radioactive particulate into the air. Dust control measures will be utilized as necessary to preclude the generation of dust.

Materials which require conditioning or further field inspection and segregation will be spread in a relatively uniform layer not exceeding one foot in thickness. The material will then be bladed with a bulldozer or raked with an excavator-mounted raking attachment. This exposed surface will again be inspected by site personnel to identify any additional non-processable or non-typical wastes and to evaluate the physical properties of the waste. Any identifiable non-processable or non-typical materials will be removed manually or by using the excavating equipment, depending on their size, condition, or type. Once conditioning and inspection is complete, the materials will be loaded onto dump trucks for transport to the Material Handling Building for subsequent blending, processing, and drying.

4.6.2 Non-processable Wastes

Non-processable wastes are those waste materials which are greater than 4 inches in size and cannot be reasonably size-reduced to less than 4 inches in size, and are not suitable for processing through the dryer. These materials will be obtained directly from the excavation or from the activities implemented to obtain processable wastes (Section 4.6.1). Depending on the quantity of materials encountered, these materials may be loaded directly into trucks for transport to the Material

Handling Building prior to loadout. In the event that the volume of these materials is relatively low, or they are only encountered on an intermittent basis, they will be temporarily staged within the pit area at the locations shown on the phase drawings. Staging will be performed so that full loads of these materials may be removed.

4.6.3 Non-typical Wastes

During the excavation of the various waste pits and the Clearwell, non-typical wastes may be encountered which will require special planning, handling, and treatment. These types of wastes may include the following:

- Pyrophoric materials
- Compressed gas cylinders
- Transformers
- Unopened intact drums
- Polychlorinated biphenyl (PCB) wastes
- Large debris (mechanical equipment or reinforced concrete)
- Thorium metal/oxide
- Asbestos.

Non-typical wastes which are determined to meet the CDF WAC, or can be treated or size-reduced (i.e., non-processable waste) to meet the CDF WAC, will be transferred to the Material Handling Building. Treatment of non-typical wastes includes emptying and appropriately managing the contents of drums, cylinders, transformers, etc. It may not be feasible to treat or otherwise make acceptable for the CDF all non-typical waste streams. Non-typical wastes which cannot be made to meet the CDF WAC will be placed in containers for transfer to FDF for further handling and disposition.

It is understood that there is a potential for encountering materials within the various units which may possess pyrophoric properties. Units which may present a potential for encountering pyrophoric materials include Waste Pit Nos. 3 and 5, the Clearwell, and the Burn Pit. Units which possess a greater potential for encountering these types of wastes include Waste Pit Nos. 2, 4, and 6. Care will be taken during the removal of any materials which are deemed pyrophoric. These materials will be handled in a manner which will prevent them from igniting due to the excavation activities. These materials will require handling by both on-site personnel and the excavation equipment. Once removed, the materials will be staged at a location within the excavation where minimal disturbance will occur. These materials will then be wetted as necessary and packaged in a manner which will minimize disturbance during transport to the Non-Typical Waste Transfer Area located between Waste Pit Nos. 4 and 6. In the event that pyrophoric materials are encountered which have ignited, they will be smothered using available soils. After these materials have been extinguished, they will be wetted and handled in the same manner as described above.

Debris which may be encountered within the waste pits include drums, cylinders, transformers, concrete rubble, and abandoned equipment. These materials will be identified by the on-site personnel who will be monitoring the working face. In the event that debris is encountered, it will be inspected to assess its condition. Furthermore, the location from which it was obtained will also be inspected to determine if additional debris is present.

Prior to the removal of additional debris, an area within the pit will be prepared to provide a suitable foundation upon which personnel may work and where excavated debris may be temporarily staged. It will be located at a safe distance away from the excavator. Depending upon the elevation along the working face at which the debris is encountered, it may be necessary to establish an area on top of the unexcavated cover due to safety concerns. If this is required, the slopes will be evaluated to assess their stability due to the loads induced by the excavator. The slopes will then be cut back, as necessary, based on this evaluation.

In order to minimize the handling of potentially damaged drums by personnel, a drum grappler mounted to the excavator will be used to extract these items. Once extracted, personnel will visually inspect the drum to assess its integrity. Intact drums will be overpacked and transferred to the Non-Typical Waste Transfer Area for subsequent disposal. The contents of all damaged drums will be emptied using the grappler and the contents will be inspected to determine if they shall be handled as either processable or non-processable. The drums will then be flattened using the tracks of the excavator. The flattened drum will then be handled as non-processable wastes. The work area will be monitored as described in Section 7.0 of this plan. All drum handling procedures will be performed in accordance with the Operational Health and Safety Plan to be submitted as part of this project.

Cylinders will primarily be handled by the on-site personnel to minimize the potential of damage which may be incurred if excavation equipment is used to remove these items. Once extricated, the cylinders will be stored at a stable and secure location within the excavation. These cylinders will be secured and/or palletized, if necessary, for transport to the Non-Typical Waste Transfer Area. All cylinders will be handled in accordance with the procedures outlined in the Operational Health and Safety Plan.

Transformers will also be removed using the drum grappler. Once removed, the transformer will be inspected by the on-site personnel to assess its integrity. If necessary, the transformer will be overpacked for transport to the Non-Typical Waste Transfer Area. Absorbent clothes and materials will be staged at the excavation so that any spills due to leaking oils may be contained. These materials will also be drummed prior to transport to the Non-Typical Waste Transfer Area.

Extremely large debris such as concrete rubble and abandoned equipment will be removed from the excavation using the earthmoving equipment. These objects will be sized as necessary to facilitate transport and placement into the railcar for disposal at the CDF, or into other containers for disposal as directed by FDF. Sizing of rubble will primarily be achieved using the buckets or blades of the heavy equipment. Some dismantling of equipment may be required by on-site personnel. Dismantling will be performed using mechanical means to the maximum extent practical. If necessary, acetylene torches may be required. The use of open fames in cutting/welding operations will be performed in accordance with the permits and procedures outlined in the Operational Health and Safety Plan. Loading, slinging, and hoisting of oversized debris will be performed in accordance with the procedures outlined in the FDF Hoisting and Rigging Manual.

Asbestos materials, if encountered, will be removed manually and using the excavation equipment. Materials containing asbestos will be double-bagged or double-wrapped prior to transport to the

Non-Typical Waste Transfer Area. Small items will typically be bagged. Larger items, such as pipes, will typically be wrapped in plastic sheeting.

4.7 Material Staging

Materials which will be temporarily staged within the pit area will include processable waste requiring free water drainage, non-processable wastes, and non-typical wastes. Processable wastes will only be staged within the pit for the time reasonably required. At the end of each working shift and whenever inclement weather (high winds, rain, etc.) is expected, staged material will be secured to preclude dust generation by proofrolling, or bucket compacting to provide a tight surface, or covering with a fabric cover, or by spraying with polyshell or equivalent. Non-processable and non-typical wastes will be staged within the pit area at the approximate locations shown on the excavation phase drawings. These staging areas may be relocated within the pit area as required to facilitate material handling. These materials will be removed when a sufficient volume has accumulated (at least one load).

Additional information regarding the suppression of dust and other fugitive emissions is presented in Section 5.0 of this plan.

4.8 Loading and Hauling

Excavated materials will be loaded into dump trucks using either an excavator or track loader. The trucks will travel along the access ramps and haul roads to the truck wash facility. At this facility, any loose materials will be removed from the truck tires and undercarriage to minimize the accumulation of sediments on the haul road. This practice will also minimize the potential for radioactive sediments to dry and become airborne. Dust generation from the haul roads and materials contained in truck beds will be controlled by the application of water or other dust suppression materials.

Additional information regarding safe driving practices, driver PPE, and maximum speed limits is presented in the Operational Health and Safety Plan.

4.9 Additional Excavation Activities

Additional excavation activities will be performed on an ongoing basis to support and facilitate the excavation activities described above. The activities will include dewatering operations and geophysical surveys.

4.9.1 Dewatering Activities

The primary dewatering will consist of sumps and low points located along the base of the excavation. However, during pit excavations, IT will supplement this system using effective methods for in situ dewatering as demonstrated in the DEEP Test Data. This may include wellpoints, trenching, and mixing to enhance drainage concurrent with the excavation process.

4.9.2 Geophysical Surveys

IT may utilize at its discretion certain geophysical surveys to estimate the location of certain types of nontypical wastes (e.g., concentrated radioactive materials, drums, etc.). In particular, these geophysical surveys may be utilized to assist the excavation work in areas where drums, debris, etc., are found in an effort to better define the lateral extent of the buried debris, approximate depth, and

relative size. Typical geophysical survey instruments include Ground Penetrating Radar (GPR) and electromagnetic (EM) devices. If used, these instruments will be calibrated and operated in accordance with the manufacturers recommendations.

4.10 Interim Grading

Interim grading will be performed upon the completion of Waste Pit Nos. 1, 2, and 3. Interim grading will consist of the removal of the berm between Waste Pit No. 1 and the northern face of Waste Pit No. 2. This material will be used to buttress the berm between the Clearwell and Waste Pit No. 3 and to fill in low areas within the finished pits. The buttress and fill activities are temporary measures to improve the slope stabiltiy and drainage.

Additional interim grading will occur when the southern berm of Waste Pit No. 5 is removed during Phase 9. These materials will be used to buttress the southern face of the berm between Waste Pit Nos. 3 and 5.

Once a waste pit is complete and certified as clean, interim berms will be constructed along berms and haul roads, as necessary, to reduce the potential for storm water run-on from contaminated areas.

During interim grading operations, temporary seeding of the exposed materials may be utilized for dust and erosion control.

4.11 Final Grading

Upon completion of all waste pit excavations, the entire area will be graded to the lines and grades as shown on the Waste Pit Restoration Plan (Appendix A), or according to the approved final design grading plan. It is assumed no off-site borrow material will be required to regrade the area. The final graded surface will be seeded with a combination of seeds as recommended by the local Soil Conservation Service (SCS) office.

The final grading of the site will include all grading, excavation, fill placement, and compaction. All earthwork will meet Ohio Department of Transportation (ODOT) standards. During the site final grading operations, IT will install erosion and sedimentation control measures (i.e., silt fences, erosion mats, etc.), as needed, to minimize sediment loadings on Paddys Run. All grading and erosion and sedimentation control measures will be designed and installed in accordance with Ohio Department of Natural Resources (ODNR) "Rainwater and Land Development, Ohio's Standards for Storm Water Management, Land Development, and Urban Stream Protection," Second Edition, 1996 (ODNR Rainwater and Land Development Guidance). The final grading will be part of the overall FEMP site regrading program and will utilize the requirements and provisions of this overall plan.

Any pumps, utility lines, monitoring wells, and other appurtenances, within the waste pit area boundaries, will be removed if encountered during the waste site grading activities. These materials will be handled consistent with the handling of debris from the waste pits.

4.12 Manpower Requirements

This project will require an experienced, well-trained, and well-supervised crew, equipped with the appropriate tools and equipment.

4.13 Equipment Requirements

The following sections present the selection parameters as well as the refueling, maintenance, and decontamination requirements for the proposed excavating equipment.

4.13.1 Equipment Selection Parameters

Construction equipment will be selected on the basis of operating safely under site conditions, reliability over an extended usage, versatility, cost, and ability to decontaminate at the end of the project. Due to the length of time over which these machines will operate (expected to be 5½ years), the bulk of the rolling stock will be purchased new or near new. Throughout the project, the planning and execution will attempt to minimize the size of the equipment inventory which will be used in contact with the waste so as to minimize the requirements for contaminated equipment disposal at the conclusion of the work.

Additionally, since existing site data suggests working soils from the waste pits will be highly heterogeneous in nature, with wide variances in moisture contents and unit weights, the equipment must be versatile enough to be utilized effectively in multiple environments. Varying soil consistencies from the localized sludges expected in Waste Pit No. 5, to the highly solid soils of Waste Pit Nos. 1 and 3, require a range of equipment. For example, smaller, low ground pressure machines will be required where conditions such as solids content, unit weight, and associated bearing capacity would preclude the use of normal single grauser tracks. Specifically, the wider, high-tracked, or pyramid pads of a low ground pressure machine exert significantly less force over the area of soils being worked. The result is more stability, less sinking, less rutting, and less disturbance.

Another factor which affects equipment selection is accessibility. For example, an extended reach boom, mounted on a conventional tracked excavator, will be used to access soils from Waste Pit Nos. 5 and 6 while working from the perimeter and may also be employed to access particularly wet materials as they are encountered throughout all of the pits.

Articulated trucks, complete with 6-wheel drive capability, will provide the versatility to safely maneuver through wet conditions over a widely varied landscape. Turning radii are significantly improved through the use of an articulating joint. The articulating joint is located directly between the cab and bed, providing turning capabilities that a conventional frame and trailer truck could not attempt. These articulating joints also provide a factor of safety for the operator. The beds are designed to actually roll over on their sides, while the cab remains upright, if extreme conditions such as road or slope failure are unexpectedly encountered. The 6-wheel drive capability provides the tractive effort necessary to maneuver through a wide range of soils, as is expected throughout the various pits.

Though final equipment selection will not be completed until a date superceded by this plans' submittal, typical equipment performance sheets for construction equipment have been included in Appendix C for reference.

4.13.2 Equipment Refueling

As shown on Figure 1-1, the primary refueling point will be a bulk fuel storage tank. An above-ground fuel line will be installed to transfer fuel to a fueling location along the haul road. IT will provide a maintenance truck or trailer, complete with fuel storage capabilities, to refuel equipment remotely if needed. Equipment will be staged beside the tank during refueling. The equipment will be inside the contamination area, while the fuel tank is outside in the support zone. This will facilitate refilling of the fuel tank with commercial resources, or with IT's maintenance truck. The refueling station will be surrounded by a self-containment dike, capable of retaining spillage in the event of a tank failure and spillage during fill and refueling operations. The tank will be grounded, with power provided from a nearby electric drop.

4.13.3 Equipment Maintenance

Equipment maintenance is a top priority if equipment is to last over the duration of field activities. Equipment will be cleaned regularly, with gross soils and sediments removed at a minimum weekly basis. Vigilant inspection, cleaning, and repainting or recoating will afford protection against excessive radiologic contamination. Routine maintenance such as daily greasing points, and maintaining liquid levels (oil, coolant, fuel, hydraulic fluids, transmission fluids, etc.) will be conducted by the operators in accordance with the respective equipment manufacturer's instructions. Preventive measures of oil and filter changes will likewise be completed at manufacturer's directed intervals. Any major corrective maintenance, such as track changeout or undercarriage work, will be completed inside the maintenance building, or in a suitable secured pad in the pit area. An experienced, well-trained mechanic will be utilized throughout the project to provide maintenance support and maintain the equipment in good working order.

4.13.4 Equipment Decontamination

To accomplish the decontamination of equipment used during the excavation of the waste pits, several measures will be implemented including:

- Pre-operation measures
- Operational measures
- Decontamination measures.

During the pre-operational phase of work, the following measures may be implemented:

- Evaluate the minimization and/or elimination of inaccessible areas as part of the equipment design and selection.

- Cover or protect, to the extent feasibly possible, inaccessible areas that remain using methods that include:

  - Smoothing out welds and rough surfaces

  - Using protective barriers to cover areas such as hydraulic and pneumatic fittings, grooved casings, and wiring bundles

- Using strippable coatings on accessible porous materials and areas of high contamination potential

- Implementing an effective maintenance program to include the installation, frequent monitoring, and replacement of filters on all air intakes.

- Minimize on-site equipment — repair and standby equipment to be kept in "clean" areas until required.

- Select and use low porosity materials where feasible.

During operations, standard operating procedures will provide direction for controlling the spread of contamination. Provisions in the operational phase will include:

- Control of the potential for cross-contamination of excavation equipment by designating equipment for the exclusive use in specific areas.

- Develop, implement, and maintain a program for routine cleaning of equipment.

- Use effective containment and control methods during equipment maintenance and repair.

- Implement and maintain an effective materials management system.

- Ongoing decontamination of nonessential equipment.

The pre-operational and operational measures are aimed at minimizing the decontamination activities which may be required. Several decontamination methods are available and they will vary based on the material/equipment, type of contaminants present, amount of contamination, and fixed-versus-loose contamination. Decontamination will be performed in accordance with standard operating procedures. A listing of decontamination methods and examples of their use includes, but may not be limited to:

- <u>Decontamination (Wet Methods)</u>:

  - Simple wet wiping with premoistened towels or with towels used in conjunction with a chemical cleaner similar to "Simple Green."
    Example: This method is typically used on smaller areas and equipment or when other methods are not practical or available. A small amount of compactable waste is generated with this activity.

  - Standard hydroblasting using high-pressure/low-volume water as the decontamination media. Chemicals such as Scrubbing Bubbles can be added as a surfactant to make cleaning more effective.

Example: This method may be used to remove gross contamination or primarily loose contaminants that are not water sensitive. Contaminants can be filtered or treated to be removed from the water.

- Steam cleaning utilizing heated water at moderate pressures. Steam is more effective on contaminants that may be contained within greasy surfaces. Chemical surfactants may be added to make cleaning more effective and a water recovery system (vacuum) can be added which uses demisters, high-efficiency particulate air (HEPA) ventilation, and waste collection to recover contaminants and maximize effluent control.
  Example: Motors, gear boxes, and drive lines are examples of equipment where steam cleaning is the most effective. Less water is used than with standard hydroblasting and contaminants can be filtered or treated for removal from the water.

- Environmentally safe degreasers are available for small-scale wiping and additives to other decontamination methods.

• Decontamination (Dry Methods, Nonaggressive):

- HEPA filtered vacuums used as a preliminary to wet methods or as a dry method to remove gross contamination.
  Example: Materials/equipment on which water cannot be used or where excessive dust, dirt, or water-sensitive contaminants are present, HEPA vacuuming will be conducted prior to beginning other decontamination methods. HEPA vacuums can be adapted to decontaminate either wet or dry materials.

- Dry tackified towels may be used to perform a dry wipe of water-sensitive contaminants or on materials/equipment where water cannot be used.
  Example: Sensitive electronic equipment may require dry decontamination.

• Decontamination (Dry Methods, Aggressive):

- Blasting techniques, typically used to remove fixed contamination where other decontamination methods are either not effective or are not cost efficient. Dry methods are also effective when the contaminants are water sensitive. Blasting methods that may be used include, but may not be limited to:

  a. Sponge blasting with small sponges that are propelled with air pressure at the piece to be decontaminated. The nature of the sponge material causes contaminated material to adhere to the sponge, which is then processed to remove contaminants and reused, minimizing secondary waste. Sponges are available that are impregnated with materials (i.e., aluminum oxide, steel grit) for more aggressive decontamination.

b. Grit blasting using materials such as steel shot as the decontamination media. The grit blaster is available with a HEPA-filtered integrated recovery and recycling system to minimize cross-contamination and secondary waste.

c. Carbon dioxide blasting which has the benefit of minimizing secondary waste.

- Removal of strippable coatings on equipment/materials where the coating was applied prior to entering contaminated areas.

- Scabbling methods for concrete and similar materials, consisting of hand-held needle and rotating scabblers and larger walk-behind or equipment-mounted scabble units. All scabbling equipment is available with vacuum shrouds to minimize fugitive dust. Additional airborne dust control measures include containment and localized HEPA-filter air units. Scabbling may be used to remove the fixed contamination on concrete or other similar porous materials. By removing only the contaminated surface area, the resulting contaminated waste is minimized and the remaining material can be disposed as clean waste.

- <u>Alternate Methods for Site Release:</u>

  - Equipment/material where it is deemed that it cannot be decontaminated to free-release limits or where it is determined that further decontamination is not cost effective, will be classified into salvageable or non-salvageable:

    a. Salvageable equipment may have further use on this site or at another site licensed to accept equipment with fixed contamination; salvageable equipment/ materials may require the application of coatings to fix contamination.

    b. Non-salvageable equipment will be characterized by survey and/or sample, volume reduced, if applicable, to or below the disposal facility WAC to minimize the volume of waste.

  - Equipment/materials that have been deemed as non-salvageable and either do not require decontamination or can be appropriately decontaminated will be disposed at a licensed industrial sanitary landfill.

All equipment decontamination will follow the procedures outlined in the Operational Health and Safety Plan and the standard operating procedures. These procedures will be developed in accordance with the current FDF procedures and a list of these procedures will be included in the Remedial Action documents.

Once the equipment is thoroughly decontaminated, it will be inspected by the SHSO, or his designee. If additional decontamination is required, it will be performed and the equipment reinspected upon completion. Once the equipment is accepted by IT's health and safety, FDF will be asked to perform a compliance inspection. If additional decontamination is deemed necessary, it will likewise be performed and the equipment reinspected upon completion.

A certificate of decontamination will be filed for each equipment item upon successful completion of the decontamination process. An example certificate has been included in Appendix D. The SHSO will be responsible for maintaining a file on site for all of the equipment decontaminated.

4.13.5 Equipment Changeout Facilities

A prefabricated truck wash facility (Appendix C) with collection sumps and side curtains, will be utilized to wash down the tires and undercarriages of trucks leaving the pits to deliver soils to the Material Handling Building. This effort will result in maintaining the waste soils inside designated areas and preventing the unnecessary distribution of sediments across the paved haul road to the Material Handling Building. The wash water will be collected and transferred to the Clearwell. This water will then be pumped to the WTS for treatment prior to discharge to the BSL.

A decontamination pad located near the maintenance building will serve as the primary decontamination facility for equipment leaving the work zone. Side curtains will be utilized to contain wind blown sediments, water vapors, and steam. Wash water will be pumped to the Clearwell. This water will then be pumped to the WTS for treatment prior to discharge to the BSL.

5.1.5 Fugitive Emissions

The primary fugitive emission identified as a concern during excavation activities is the generation of dust from haul trucks carrying excavated materials to the process area. The surface of each truck load can be sprayed with a dust suppression agent, such as water mist, to help control dust generation during transport. If application of dust suppression agent is not adequate to prevent visible dust generation, the haul truck bed can be covered with a tarp. The tires and undercarriages of haul trucks will be washed at the truck wash facility to help control the potential for dust generation. A speed limit of 15 miles per hour will be enforced for heavy equipment and all vehicles traveling within the unsurfaced excavation area to minimize the potential for dust generation.

5.2 Dust Monitoring Methods

Sampling of ambient air monitoring will be performed to evaluate dust levels if determined to be necessary by the site SHSO. Monitoring for dust will be performed visually. It will be the responsibility of each IT employee to observe his work area for the potential and/or actual generation of dust. Any dust condition will be reported to the supervisor, foreman, or group leader in the work area who will arrange for immediate wetting of the area or implementation of other measures necessary to control the dust. If necessary, the work activities will be minimized or stopped in that area until dust emissions are controlled. IT will work cooperatively with those FDF personnel who routinely patrol the site to identify and correct dust nuisance hazards.

Fluor Fernald Document Change Notice Review & Concurrence	
Fluor Fernald Project No.:10500	IT Project No.:773481
Project Name: Waste Pit Remedial Action Project (WPRAP)	
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NOTE: Concurrence is given to changes to sections 4.4 and 4.5 only at this time. Concurrence for changes to sections 4.8 and 5.1.5 is dependent of review of OEPA which is still pending.

Fluor Fernald PE Concurrence: _____ Date: 5/8/02

Performance Grade Assigned to Change 5

Verification of Completion of Work:

Fluor Fernald PE _____ Date: _____