WORKPLAN

FINAL DRAFT

INTERIM ACTION WORKPLAN FOR THE FORMER SATRALLOY SITE JEFFERSON COUNTY, OHIO

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1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this Interim Action (IA) Workplan for the Former Satralloy Site (the Site) on behalf of Cyprus Amax Minerals Company (Cyprus Amax).

1.1 Site Description

The Site consists of approximately 333.5 acres of land that includes an abandoned ferro-alloy plant. The Site is located in Cross Creek Township, Jefferson County, Ohio, approximately four miles south of Steubenville, as shown on Drawings IAG-100, IAR-110, and IAR-200. Access is via County Road 74. The Site is bordered on the north, west, and south by Cross Creek, a perennial stream that empties into the Ohio River.

Construction at the Site began in 1958. Processing facilities consisted primarily of two production mills, an office building, baghouses, ancillary support buildings, and water and wastewater treatment facilities. The alloys produced in the plant were made from chromium ores by smelting and refining in four electric arc furnaces housed in the mill buildings. The furnaces were shut down in 1982, and primary ore processing operations ceased.

By-products of the production process are located around the Site. These by-products include baghouse dust, high-carbon chrome slag, low-carbon chrome slag, other unidentified materials with varying concentrations of metals, and miscellaneous materials.

From 1982 to 1994, high-carbon slag was taken from Site stockpiles, crushed, and reprocessed in Site ponds by Satra Concentrates to recover residual metal alloys.

The quantity of slag residuals remaining on the Site is estimated to be on the order of 800,000 cubic yards.

1.2 Applicability of Hazardous Waste Regulations

1.2.1 Bevill Exclusion Materials

In October 1980, the Resource Conservation and Recovery Act (RCRA) was amended by Section 3001(b)(3)(A)(ii), known as the Bevill exclusion, to exclude "solid waste from the extraction, beneficiation, and processing of ores and minerals" from regulation as hazardous waste under Subtitle C of RCRA. This exclusion applied to by-products from operations at the Site because chromium ore was processed to produce chromium. In 1991, the scope of the Bevill exclusion was limited to 20 specified wastes listed at 40 CFR 261.4(b)(7). Because none of these 20 processing wastes are applicable to the Site, any by-products or wastes that were either generated or actively managed at the Site after 1991 no longer are automatically exempt from hazardous waste regulation under the Bevill exclusion.

No hazardous wastes at the Site have been identified as generated after 1991. Some by-products or wastes at the Site have been identified by Ohio Environmental Protection Agency (OEPA) as actively managed after 1991. These are addressed in Section 1.2.2. The other mineral processing by-products and wastes at the Site are not currently regulated under RCRA because they were covered by the Bevill exclusion prior to 1991 and have not been generated or actively managed since 1991.

1.2.2 Actively Managed Piles

Certain piles have been identified by the OEPA as having been actively managed after 1991 by a former Site operator, as shown on Drawing IAR-210. While Cyprus Amax does not necessarily agree with this identification, it has agreed to manage these piles as described in Section 6.

1.2.3 Area of Contamination Policy and Director's Exemption

Other than the actively managed piles addressed in Section 1.2.2, the other mineral by-products and wastes at the Site would not be regulated under RCRA if there never were any active management of them in the future. However, the contemplated interim actions and future remediation of the Site could be sufficiently extensive to constitute active management for purposes of triggering future regulation under RCRA, but for the application of the U.S. EPA Area of Contamination (AOC) policy under RCRA, which interprets certain activities as not constituting generation or active management,[1] and the issuance by the Director of the OEPA of an exemption under Section 3734.02(G) of the Ohio Revised Code ("02(G) Exemption"). The AOC policy and the 02(G) Exemption are designed to facilitate and encourage remediation, such as that contemplated for the Site.

Site investigation and remediation activities involving the former Bevill-exempt materials referenced above and/or any other materials at the Site, including interim actions under this workplan, and any remediation to be conducted in the future, will be performed in accordance with the AOC policy pursuant to the letter from Michael Sherron to Barbara Nielsen dated October 19, 2012 (Appendix A). Specifically, this letter stated: "Ohio EPA acknowledges that Cyprus has demonstrated that contamination appears to be present across the Site in the continuous and contiguous fashion that designation of the AOC requires, and thus we conclude that the AOC concept is applicable." The letter further stated: "In the event that Cyprus is able to demonstrate in the future, to the satisfaction of Ohio EPA, that continuous and contiguous contamination is present in additional locations on or off the Satralloy property, the Agency acknowledges that the AOC concept would be applicable to such areas as well." As discussed during the September 25, 2012 meeting between the parties, and as set forth in the Preliminary Evaluation Report and Remedial Investigation/Feasibility Study Workplan for the Former Satralloy Site, Cyprus Amax has documented that continuous and contiguous contamination is present across the Site and in a certain off-

[1] It is Cyprus' view that the AOC policy alone is legally sufficient to allow the on-site management of the former Bevill materials, without the need for the 02(G) Exemption. Nevertheless, Cyprus is agreeable to obtaining an 02(G) Exemption, without waiving its position that the AOC policy is applicable and sufficient.

property areas, including areas where slag piles extend beyond the property boundary and the rail spur area at the facility. This IA Workplan outlines the activities that Cyprus Amax plans to conduct in those areas. Because it has already been demonstrated that continuous and contiguous contamination is present in the areas in question, all of the activities to be conducted pursuant to this IA Workplan will be performed in accordance with the AOC policy, consistent with the above-referenced letter.

In addition, Cyprus Amax will obtain an 02(G) Exemption from the Director prior to managing any materials at the Site that exhibit the Toxicity Characteristic under this IA Workplan. The 02(G) Exemption will allow Cyprus Amax to manage on-Site the piles addressed in Section 1.2.2 (until any piles exhibiting the Toxicity Characteristic are sent off-Site for disposal) and all of the mineral processing materials that were previously covered by the Bevill exclusion at the time they were generated at the Site, without subjecting such management to regulation under RCRA and the regulations promulgated thereunder. The 02(G) Exemption will not apply to the extent that any of the piles addressed in Section 1.2.2 or former Bevill-exempt materials are sent off-Site for disposal or other off-Site management.

1.3 Interim Action Objectives

As specified in the COPI, the interim actions to be performed under this workplan have the following objectives:

- Secure the Site from public access
- Restrict access of human and ecological receptors to baghouse dust in certain areas

Cyprus Amax determined that the best means of accomplishing long-term safety and security for Site buildings was demolition, considering that these buildings also need to be removed for final remediation of the Site.

1.4 Interim Action Overview

The following interim actions were performed in 2010 in consultation with OEPA:

- Instituted security personnel on the Site 24 hrs/day, 7 days/week.
- Erected warning/no trespassing signs at 100-foot intervals along the entire facility property line.
- Installed fencing and/or guardrails along the boundary of the plant area adjacent to County Road 74 to inhibit access to the Site.
- Installed guardrails and/or other physical barriers at remote access locations of the Site.
- Installed fencing around Site buildings to control access to the buildings prior to demolition.
- Mitigated selected high-risk conditions in the mill buildings to increase safety for the initial phases of regulated materials abatement and building demolition.

In addition, an isolated wetland in the Lower Rail Spur was filled in March 2012 under an OEPA permit in preparation for rail spur construction.

The following additional interim actions will be performed under this workplan:

- Re-establish a rail spur into the Site to support interim actions and future remediation activities. Completion of the rail spur is required before any materials can be shipped off-Site.
- Sample and analyze specified piles considered to have been "actively managed" after expiration of the Bevill Exclusion (Drawing IAR-210) to determine which, if any, must be managed as hazardous waste. Materials suspected of containing asbestos in these piles will be sampled and analyzed for asbestos.
- Remove and dispose off-site "actively managed" piles determined to be hazardous waste. Piles that are not hazardous waste will be left in place, or moved as needed to not interfere with other interim action activities.
- Remove and dispose off-site asbestos-containing materials (ACM) in the "actively managed" piles.
- Establish stockpiles for:
  - Overburden soil from the clean soil borrow area
  - Vegetated soil from clearing and grubbing
  - Chipped vegetation
- Remove and dispose ACM off-Site, primarily transite, from the structures to be demolished.
- Collect baghouse dust and other dust in and around the mill buildings containing elevated concentrations of chromium and/or lead into a single covered and fenced staging area within the Site.
- Temporarily remove residual materials from concrete bins adjacent to the North Mill Building so that the bin walls can be demolished, and then move the materials back onto the concrete slab between the demolished bin walls. Material in the concrete bins adjacent to the South Mill Building is slag and will be left in place; bin walls will be demolished to the existing slag grade.
- Demolish all structures, including the mill buildings, baghouses, and associated structures.
- Dispose of miscellaneous wastes, litter and debris, including abandoned rail ties from former rail spurs, at appropriately permitted off-site facilities. This will include removing exposed debris in the Former Landfill, but will not include excavating into the Former Landfill.
- Remove and/or mitigate any significant safety hazards remaining after demolition. This will include placing backfill against retaining walls to reduce fall hazards. Soil that stormwater has washed into the South Mill Building ("wash-in" soil) will be used as part of the backfill against a retaining wall that will remain after demolition of the building.
- Repair and/or upgrade Site roads.
- Remove slag from the ditch along County Road 74 and place on-Site. The purpose of this removal will be to (a) improve traffic safety by minimizing stormwater flow over the road, and (b) improve the water quality in stormwater discharging from the Site.
- Implement stormwater controls per the approved Storm Water Pollution Prevention Plan (see Section 2.4).

Table 1 summarizes the interim action activities described in this workplan. As noted in Section 1.2.3, all of the activities under this IA Workplan will be performed in accordance with the AOC policy, consistent with the October 19, 2012 letter from Michael Sherron to Barbara Nielsen. Additional activities may be necessary to implement the interim actions. OEPA will be notified of activity changes in the monthly progress report for the Site.

1.5 Relation of Interim Actions to Other Site Activities

Demolition activities would be performed as part of Site remediation under any reasonable scenario for post-remediation land use and are not contingent upon the results of the remedial investigation (RI) and feasibility study (FS). They can therefore be performed at any time without affecting other potential remediation activities that are not presently defined. The safety benefits of performing demolition as an interim action justify removing these hazards at an early time.

The dust staging area to be constructed during interim action will be a temporary facility. The chromium-containing dust (including baghouse dust) placed in this staging area will be further characterized during the RI, and final disposition will be determined as part of the FS.

1.6 Perimeter Air Monitoring

During demolition, perimeter air quality monitoring will be performed to document that no off-Site airborne releases of regulated materials above regulatory limits occur. This monitoring will be as described in the Perimeter Air Monitoring Workplan (incorporated in the IA Workplan as Appendix B).

1.7 Health and Safety

All activities described in this workplan will be performed in accordance with the requirements of the Site *Health and Safety Plan* (HASP; Golder 2012). Additional health and safety requirements for demolition and construction activities will be addressed in project-specific health and safety plans prepared by the contractor(s). These plans will incorporate all pertinent Federal and State of Ohio requirements for the materials and activities addressed in this workplan and will be submitted by Cyprus Amax to OEPA for information prior to the start of the associated demolition or construction activities.

1.8 Transportation

Road transportation to and from the Site has severe limitations. In particular, the bridge across Cross Creek nearest the Site on County Road 74 has a load limitation insufficient for transporting equipment and materials necessary for performing the interim actions. In addition, the roads accessing the Site are in poor condition.

The Wheeling and Lake Erie Railway Company (W&LER) has a main line that runs near the Site. During former operations at the Site, there were two rail spurs that served the Site. To facilitate interim actions and subsequent final remediation, Cyprus Amax intends to re-establish one of these rail spurs to allow rail transportation to and from the Site.

2.0 INTERIM ACTION MANAGEMENT

2.1 Project Organization

Duties and responsibilities of key personnel are as follows.

Cyprus Amax Project Manager (CAPM). The CAPM, Ms. Barbara Nielsen, will have overall responsibility for ensuring that the interim action is implemented in accordance with the requirements of this workplan. The CAPM will ensure that all project and regulatory requirements are met. She will be the official point of contact for all communications with OEPA under this workplan, although she may authorize direct contact by other members of the project team as appropriate. Ms. Nielsen will provide strategic direction and will oversee the work of the RI/FS consultant, Golder Associates Inc.

Golder Associates Project Manager (GAPM). Mr. Lee Holder will be the GAPM and will be responsible for the day-to-day management of the activities described in this workplan. He will coordinate the activities of other members of the project team and ensure that required technical resources are provided. Mr. Holder will also ensure that Quality Assurance (QA) activities are correctly implemented and documented and that the work is performed in accordance with the Health and Safety Plans. Golder will be responsible for preparing the demolition bid package. He will implement subcontracts for specialty services and construction contractors (e.g., fencing) other than the demolition contractor as may be required.

Cyprus Amax Demolition Manager (CADM). In association with the CAPM, the CADM will be responsible for reviewing bids from potential demolition contractors to ensure that the scope is complete. The CADM will implement the contract between Cyprus Amax and the demolition contractor(s). He will provide technical support as required during demolition, oversee health and safety compliance, and perform the final inspection and approval at the end of demolition activities. The CADM will refer any environmental issues to the CAPM and will implement the direction received from the CAPM.

Construction Manager (CM). Golder will provide an experienced construction manager approved by the CAPM to provide oversight and document construction quality assurance (CQA) of the demolition and construction activities associated with this interim action. The CM will be responsible for documenting interim action activities; reviewing the work for conformance with plans, specifications, and other contract documents; tracking quantities and reviewing contractor invoices; performing CQA; and coordinating the activities of contractors and monitoring personnel. The CM will provide safety orientation to visitors and other on-site personnel, except for asbestos abatement and demolition contractor personnel. To minimize the potential for miscommunication, the CM will serve as the official point of contact between the contractors, monitoring personnel, and engineering and project management. The CM will be on Site full-time during the interim action, apart from non-critical support activities such as mobilization.

Demolition Contractor. The demolition contractor will be responsible for performing all demolition activities and will be selected via a bidding process. The demolition contractor will plan and execute the work to meet the project and regulatory requirements; will be responsible for all health and safety of contractor personnel involved in demolition activities, including equipment, training, and monitoring; and will manage all materials from demolition activities in accordance with Federal, State, and project requirements. The demolition contractor will direct and manage his own subcontractors. The demolition contractor will be responsible for removal and proper disposal of asbestos and other regulated materials (either directly or using certified subcontractors) in the structures being demolished. The demolition contractor will also be responsible for installation of the rail spur.

Other Contractors. It is anticipated that most of the interim action work will be performed by the demolition contractor and his subcontractors. However, some of the interim action work may be performed by other contractors. Any contractor personnel that are not subcontractors to the demolition contractor will receive Site orientation and health and safety orientation from the CM.

Air Monitoring. Golder will perform perimeter air monitoring during demolition activities. Personnel assigned to perform field monitoring activities will be appropriately qualified. The demolition contractor will perform any air monitoring in the work area as required for health and safety or to meet regulatory requirements (e.g., asbestos abatement).

All contractors will be required to prepare and follow their own health and safety plans consistent with the overall Site HASP.

2.2 Interim Action Activities Sequence

The anticipated sequence of the major activities for the interim actions described in this workplan is as follows:

- Implement 24-hour security patrols (completed).
- Implement physical security measures, including fencing (perimeter and around buildings), guardrails, and signage (completed).
- Perform building hazard mitigation (completed).
- Select the demolition contractor, who will also be responsible for regulated materials abatement (completed).
- Determine which, if any, “actively managed” piles are hazardous waste.
- Implement stormwater controls per the approved Storm Water Pollution Prevention Plan (see Section 2.4).
- Re-establish a rail spur into the Site.
- Repair and/or upgrade Site roads.
- Remove slag from the ditch along County Road 74 and place on-Site.

- Handle "actively managed" piles as appropriate based on hazardous waste determination.
- Perform regulated materials abatement in buildings.
- Perform demolition of Site structures.
- Placement of baghouse dust and dust from the mill buildings in the on-Site dust staging area will be ongoing as demolition proceeds.
- Remove and stockpile overburden from the clean borrow area.
- Additional temporary staging may be needed for materials during abatement and demolition, but these temporary staging areas will not remain after completion of demolition.
- Ship steel off-site for recycling.
- Ship transite and other wastes from interim action activities off-site for proper disposal.
- The final cover and fencing for the dust staging area will be installed after demolition has been completed.

2.3 Deliverables

At the conclusion of this interim action, a report will be prepared that describes the activities, including parties involved, chronology, materials, quantities, disposal, monitoring and testing results, retained facilities, and other pertinent information to document the work. Cyprus Amax will provide a draft report to OEPA for review and comment, will resolve comments and revise the report as needed, and submit the final report to OEPA.

2.4 Permits

An air permit may be required for concrete crushing activities. This will be obtained, if necessary, by the demolition contractor. It is anticipated that a crusher with an existing permit will be used. No other air permits are required for interim action activities.

Interim actions described in this workplan will be performed under Ohio's Construction Stormwater General Permit (OHC000003). Cyprus Amax has submitted a Stormwater Pollution Prevention Plan (SWPPP) to OEPA for interim action activities, and this plan was approved by OEPA on July 24, 2012.

The demolition contractor will contact Jefferson County, Cross Creek Township, and OEPA for any permits required for demolition activities. The demolition contractor will also contact Jefferson County and the Ohio Department of Transportation to obtain hauling permits for oversized equipment, if necessary.

Off-site disposal facilities for materials removed from the Site resulting from abatement and demolition activities will be permitted for the types of materials being disposed of and will be able to provide copies of their permits upon request. All disposal facilities will be subject to audit and approval by Cyprus Amax prior to use.

3.0 SITE SECURITY

In addition to full-time security guards, several security measures have been implemented to control access to the Site and reduce the potential for exposure of personnel to dangerous situations. Details of the security measures are shown on the Drawings (Appendix C) and are described in the following sections.

3.1 Fencing and Guardrail

Industrial-grade, 8-foot high chain link fencing was installed along the boundary of the plant area adjacent to County Road 74. In some locations, fencing was not installed because it would have required regrading slag materials. In these locations, conventional highway guardrail was installed to prevent vehicle access. The guardrail was constructed of galvanized steel materials, with posts set into concrete on nominal 6-foot centers. The top of the guardrail was installed 3 feet above ground surface so that it is visible under a 2-foot snow layer. Guardrail fasteners were secured so that they cannot be easily removed.

Chain link fence was also erected around the perimeter, or immediately inside of, the mill buildings and other Site structures to prevent unauthorized entry prior to demolition. Temporary (rental) fencing was used for some portions of this fencing.

Guard rail was also installed in locations near the northern boundary of the Site across former mine haul roads, terraces, and other relatively flat areas that could provide vehicle access.

3.2 Security Guards

Security personnel will be present on the former Satralloy Site 24 hours per day, 7 days per week until demolition activities have been completed and/or it has been determined that their services are no longer required. Security personnel are currently off-duty officers from the Jefferson County Sheriff's office and local police departments. Security personnel will be trained in the Site Health and Safety requirements prior to being assigned to this project. Duties of security personnel will include controlling Site access, and inspecting fencing and other Site security features for damage.

3.3 Mill Building Risk Mitigation

Selected potential high-risk conditions in the mill buildings have been mitigated to increase safety for the initial phases of regulated materials abatement and building demolition. These mitigation measures consisted primarily of:

- Welding bars or grates across openings in floors or walls which are large enough to fall through.
- Erecting cables and high-visibility safety fence along the edges of floors, landings, and other areas where railings have been removed.

- Removing sections of conveyor and associated stairway behind the buildings which could provide entry paths, and backfilling conveyor pits with clean soil to eliminate the associated fall hazard.
- Other measures to secure the buildings against tripping and fall hazards.

3.4 Signage

Warning signs as shown on the Drawings have been placed on fences and posts driven into the ground at a number of locations on the Site:

- Large warning and information signs have been installed on the perimeter fence adjacent to the vehicle access gates.
- Warning signs have been installed on perimeter fences and along the property line in remote areas of the Site at maximum 100-foot intervals.

4.0 DEMOLITION

4.1 Overview and Objectives

The objective of demolition will be to remove abandoned structures which could pose a hazard to the public. These are shown on Drawings IAR-240 and IAR-245 and include:

- Mill buildings
- Baghouses
- Raw materials bins and associated structures
- The water plant, water tank, and cooling towers
- Laboratory building
- Administrative office
- Electrical control room and transmission towers
- Wastewater treatment plant
- The slurry tower and associated pipeline in the northern portion of the Site
- Former truck scales
- Miscellaneous scrap and debris

4.2 Regulated Materials Surveys

A regulated materials survey was performed in August 2006 (Lawhon 2007) and a supplemental survey in May 2010 (Lawhon 2010). The results of these surveys indicate that transite siding, which contains asbestos, was used extensively in both mill buildings. Lead plugs were used to cover fasteners in the siding, and the paint on structural components of the mill buildings was determined to contain lead. Other regulated materials identified during the survey include mercury vapor lamps, fluorescent lights and ballasts, asbestos pipe insulation, friable asbestos in the electrical control room, and small quantities of leftover process chemicals. Electrical transformers containing PCBs were reportedly removed by the USEPA. Analysis of samples obtained during the regulated materials surveys (Golder 2007) did not identify PCBs above cleanup levels in soils.

4.3 Description of Demolition Activities

4.3.1 Structure Removal

4.3.1.1 Buildings

The buildings listed above in Section 4.1 will be demolished, as well as any other structures located in the main plant area that may pose a risk. The initial activity will be abatement, which will consist primarily of removing baghouse dust and mill building dust, transite siding on the buildings, and other regulated materials. Debris and similar materials on the floors of the buildings and in other locations that would interfere with structural dismantling will also be removed at this time. Abatement of regulated materials will be completed prior to demolition, to the extent feasible.

Once abatement has progressed sufficiently, the buildings will be dismantled. All structural steel will be removed for off-Site recycling.

4.3.1.2 Concrete Slabs and Walls

Most concrete walls, above-grade foundations, and above-grade footings will be demolished to ground level. Concrete slabs at grade will in general not be removed. Clean concrete will be broken into fragments and stockpiled at the Site for further crushing. Cleaning verification procedures are discussed in Section 4.4. Some concrete walls that serve as retaining walls will be left in place, as shown on the Drawings. Demolished concrete will be crushed and the product will be used on-Site as clean backfill material.

4.3.1.3 Subgrade Structures and Utilities

Open pits and similar structures in and around the mill buildings that pose a potential trip or fall hazard will be backfilled with lean concrete, crushed concrete, or clean soil. The locations of these pits will be documented in case further investigation is considered necessary during the Site remedial investigation.

Stormwater catch basins, pipes, culverts and related facilities will in general be left as-is, because they may be incorporated into the final surface water management system for the Site. If a storm drain is determined to no longer be needed it will be plugged at the entry point. Safety barriers will be installed on any open catch basins or drop structures to prevent injury to personnel. Other subsurface utilities such as pipes, electrical conduits, water lines, and the like will be left in place unless they pose an immediate hazard.

The demolition contractor will perform a utility locate survey prior to start of field activities to verify that there are no currently active utilities at the Site, other than those installed for support of interim action activities.

4.3.1.4 Concrete Bins Behind the Mill Buildings

The vertical interior walls of the concrete bins, together with the associated overhead railroad trestle support structures, will be demolished. Prior to demolition, the residual materials in the bins adjacent to the North Mill Building will be moved onto the concrete apron in front of the bins. The interior walls will then be demolished to the same grade as the concrete slab. The two end bin walls will be demolished to approximately half of their height, and the remainder of the walls will be left in place as retaining walls. To decrease fall hazards, the upper approaches to the concrete bin area will be sloped back from the top of each end bin wall at a grade of 2:1. New fill will be placed in front of the bin's end walls at a 2:1 slope down to the concrete slab. Once all of the concrete rubble has been removed from the demolished North Mill bin walls, the residual materials will be moved back into the bin footprint with 1:1 slopes.

The slag in the concrete bins adjacent to the South Mill Building will not be moved. The bin walls will be demolished to the same grade as the slag.

4.3.2 Structures and Facilities to be Retained

The following structures and facilities will not be removed as part of this interim action:

- Abandoned oil and gas well pumps, tanks, and related equipment at various locations around the northern end of the Site. Any necessary actions will be determined as part of the RI/FS.
- Groundwater wells in the plant area. The disposition of wells will be addressed during the RI.

4.3.3 Dust Control

The demolition contractor will be responsible for dust control during the interim action activities described in this workplan. General nuisance dust from vehicles operating on gravel surfaces will be prevented by a light water spray. Dust generation during abatement work in the buildings will likely be controlled by working in limited locations at any one time, enclosing the abatement areas in plastic sheeting to provide containment, wetting, or negative air flow, or some combination of these methods. Dust from concrete crushing operations will be minimized by a light water spray.

Details of dust control methods will be provided by the demolition contractor as part of his Means and Methods statements and contractor site-specific health and safety plan due before mobilization.

Water for dust control, as well as other non-potable uses, will be obtained from Cross Creek and stored in tanks on the Site. Water trucks will be used to distribute the water around the Site. Erosion and sediment control measures (e.g., silt fences and straw bales) will be implemented as necessary to ensure that sediment is not introduced into Cross Creek.

4.4 Cleaning

Cleaning procedures will be as described in Project Specification 02081 – Cleaning Procedures, provided in Appendix D. To prepare steel for recycling, dust and flaking paint will be vacuumed from the steel prior to off-Site shipment.

Concrete will be cleaned sufficiently to be used as “clean hard fill” in compliance with Ohio Administrative Code (OAC) 3745-400-05. Pilot testing of concrete cleaning has been performed, as documented in Appendix E. This testing documents that dry cleaning (as described in Project Specification 02081) is sufficient to prepare Site concrete for use as clean hard fill.

4.5 Management of Materials from Demolition

Materials from demolition will be managed in accordance with applicable rules and regulations and as allowed by the 02(G) Exemption and the AOC policy (see Section 1.2.3). Disposition may include reuse, recycling, and/or disposal.

4.5.1 Off-Site Disposal

Details for materials disposed off-Site are provided in the project's Waste Management Plan (incorporated in the IA Workplan as Appendix F). Representative samples will be obtained of materials to be disposed off-Site as wastes, and these samples will be analyzed in accordance with applicable regulations for waste characterization. No material will be disposed of by burning.

For the transite panels, dust removal techniques have been evaluated using field testing (Appendix G). Representative samples of the transite panels with no dust removal and with varying degrees of cleaning were analyzed by the TCLP. None of the panels exceeded TCLP limits, and therefore the transite will be disposed off-Site as non-hazardous ACM waste with only as much dust removal as is considered necessary for dust control.

4.5.2 On-Site Management

4.5.2.1 Materials to be Recycled

The following materials will be managed on-Site before recycling off-Site:

- Steel
- Lead
- Copper and other non-ferrous metals

The vast majority of the material to be recycled will be steel from building structures. Abatement includes dust collection and staging (Section 5). To prepare steel for recycling, the steel will be vacuumed to remove loose dust. Accreted dust on the steel will also be removed to the extent required for acceptance by the recycling facility. Steel cleaning details are provided in Appendix D. Abatement also includes removal of transite panels, trash, equipment, and regulated materials from the buildings. Abatement work will be completed in a building before demolition of the building. As part of demolition of the mill buildings, the steel structures will be cut and the steel dropped or placed within the building footprint. The steel will then be further cut as necessary and loaded into trucks. The trucks will carry the steel to the on-Site rail spur. The steel will typically be loaded directly into rail cars for transport. Some steel may be temporarily stockpiled on one of the outside concrete pads near the east end of each Mill Building or in the rail loading area prior to transport. Loaded rail cars will be transported to an appropriate off-Site recycling facility.

Most of the lead at the Site is in the form of covers for bolts in buildings (primarily for attachment of the transite panels in the mill buildings). There is some sheet lead on the foundation of the wooden water storage tank. The lead bolts will be collected in buckets and taken to the rail spur; the lead sheet will be rolled and carried to the rail spur or cut and put in buckets. At the rail spur, the lead will be loaded into a rail car and transported to an appropriate off-Site recycling facility. Some lead may be transported by truck.

Some copper and other non-ferrous metals may be encountered during demolition. As with the steel and lead, these metals will be collected, loaded into rail cars, and transported to an appropriate off-Site recycling facility.

4.5.2.2 Other On-Site Management

Piles of baghouse dust near the mill buildings and dust from within the mill buildings (known or suspected to contain elevated concentrations of chromium) will be managed on-Site as described in Section 5.

Materials considered to have been “actively managed” at the Site after 1991 (i.e., those described in Section 1.2.2) will be managed on-Site as described in Section 6.

4.6 Clean Fill

Four types of material may be used as clean fill: clean crushed concrete, imported gravel, imported stone, and selected Site soils. Crushed concrete will be obtained from building demolition, with cleaning as described in Section 4.4. Imported gravel and stone will be used in some of the contractor work areas and in the construction of the rail spur. Borrow soil will be obtained from the area shown on Drawings IAR-240 and IAS-515. The borrow soil used as fill during interim action will have a total chromium concentration less than 230 mg/kg and no other chemicals above OEPA screening levels. The total chromium limit of 230 mg/kg is solely intended as a temporary, highly protective value being used because a Site-specific cleanup level has not yet been established. Considering the low toxicity of trivalent chromium, the Site-specific cleanup level for chromium in soil is expected to be much higher.

5.0 MANAGEMENT OF BAGHOUSE DUST AND DUST FROM MILL BUILDINGS

5.1 Overview and Objectives

Piles of baghouse dust near the mill buildings and dust from within the mill buildings (known or suspected to contain elevated concentrations of chromium) will be collected and placed in a staging area within the Site. This dust staging area will be designed to prevent exposure to on-site personnel and prevent off-site migration in stormwater. Final disposition of this dust may involve recycling, covering, off-site disposal, or other options and will be determined during the FS and remedy selection.

5.2 Identification of Baghouse Dust

Drawings IAR-210 shows the locations of the baghouse dust to be placed in the dust staging area under this workplan.

5.3 Staging Area Design

Baghouse dust will be placed on the existing concrete slab in the eastern portion of the North Mill Building (Drawing IAR-240). The design of the dust staging area is shown on Drawing IAR-255.

5.4 Removal and Placement

Chromium-containing dust in the mill buildings will be vacuumed using HEPA vacuum equipment into 8-mil plastic bags (“Q” baffle bags or equivalent). Where there are piles of baghouse dust, the dust will be collected using front end loaders or other bulk loading methods and the dust will be transferred into the same 8-mil plastic bags used on the vacuum units. The bags will be placed on geomembrane at the location of the staging area. Once all of the bags are placed the geomembrane material will be lifted over the stored dust bags. This will keep any stormwater that may come into this area from coming in contact with the dust inside the bags. In addition, there will be a cover geomembrane laid over the entire top of all the dust bags for further weatherproofing. Large blocks of concrete will be placed tightly around the perimeter of the “wrapped” pile. These blocks will have tie-down hooks to run roping through that will be used to keep the cover in place.

5.5 Inspection and Maintenance of the Dust Staging Area

The dust staging area will be inspected at least monthly by security or other trained personnel during the course of RI/FS activities. Damage will be indicated by tears or holes in the cover, displaced flaps of geomembrane, and similar features that expose the underlying bags.

If damage is observed, the hole will be patched, additional weighting will be added, or other maintenance performed to mitigate the problem. A supply of extra geomembrane and other repair materials will be maintained on Site.

6.0 MANAGEMENT OF "ACTIVELY MANAGED" PILES

As described in Section 1.2.2, certain piles have been identified by the OEPA as being "actively managed" by a former Site operator, as shown on Drawing IAR-210. As part of the interim actions under this workplan, in general these Section 1.2.2 piles will be managed as follows:

- Representative composite samples will be collected from these piles and analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) for selected metals. In addition, materials in the piles suspected of containing asbestos will be sampled and analyzed for asbestos. A sampling plan will be submitted to OEPA.
- Piles that exhibit the toxicity characteristic based on TCLP testing will be removed and disposed off-site as hazardous waste following completion of the rail spur.
- Piles that are not hazardous waste will be left in place, or moved as needed to not interfere with other interim action activities.
- Non-hazardous "actively managed" piles with ACM will be removed and disposed off-site at an appropriately permitted facility.

6.1 North Mill Building Piles

There are two piles described in Section 1.2.2 that are on or near a concrete slab near the North Mill Building (Drawing IAR-210).

Either (or both) of these piles, if determined to be hazardous waste, will be loaded into a rail car and disposed off-site at an appropriately permitted facility. These piles will be consolidated on one corner of the concrete slab until the rail spur is ready for use.

Either (or both) of these piles, if determined to not be hazardous waste but contain ACM, will be loaded into a rail car and disposed off-Site at an appropriately permitted facility. These piles will be consolidated on one corner of the concrete slab until the rail spur is ready for use.

Either (or both) of these piles, if determined to not be hazardous waste and not contain ACM, will be moved off the concrete slab onto a nearby unpaved area where they will not interfere with interim action activities.

6.2 South Mill Building Pile

There is a large pile of soil within the South Mill Building (Drawing IAR-210) believed to have been created by a former Site operator, which is one of the piles described in Section 1.2.2. Abatement activities are scheduled to begin in the South Mill Building before the rail spur installation is completed.

If this pile is hazardous waste, it will be disposed off-Site at an appropriately permitted facility. However, because abatement will begin before the rail spur is ready for use, this pile will be temporarily moved onto the concrete floor inside the South Mill Building. Once the rail spur is operational, the pile will be loaded into rail cars and hauled for off-Site disposal. Because the pile will be under a roof, no cover is needed for this temporary staging of the pile.

If this pile is not hazardous waste, the pile material will be used as backfill to reduce fall hazards of the steep hill slope at the South Mill Building. The material will be on a concrete slab located just outside the building to the southwest and covered with plastic. Geofabric or plastic will be used to separate pile material from adjacent surrounding soil so that it is not mixed with clean backfill and may be investigated during the RI.

6.3 Other "Actively Managed" Piles

As shown on Drawing IAR-210, there are piles described in Section 1.2.2 that are located to southwest of the South Mill Building where interim action activities are not planned.

Any of these piles, if determined to be hazardous waste, will be loaded into a rail car and disposed off-site at an appropriately permitted facility. These piles will be left as is until the rail spur is ready for use.

Any of these piles, if determined to not be hazardous waste but contain ACM, will be loaded into a rail car and disposed off-Site at an appropriately permitted facility. These piles will be left as is until the rail spur is ready for use.

Any of these piles, if determined to not be hazardous waste and not contain ACM, will be left in place as is.

6.4 Final Disposition of Piles Left On-Site

Any of the piles described in Section 1.2.2 that are left on-Site, which will have been determined to not be hazardous waste, will be investigated during the RI and the appropriate final disposition will be determined in the FS.

7.0 SOIL AND VEGETATION STOCKPILES

The following stockpiles will be created during interim action under this workplan:

- Overburden from the clean soil borrow area
- Vegetated soil from clearing and grubbing
- Chipped vegetation from clearing

In addition, there is soil on inside the South Mill Building that was carried in by stormwater from a malfunction in the stormwater drainage system, which is being called “wash-in soil”.

7.1 “Wash-In Soil” in the South Mill Building

Three grab samples of the “wash-in soil” have been analyzed for total chromium, with results of 360, 430, and 570 mg/kg. A composite of these three samples was tested using the Synthetic Precipitation Leaching Procedure (SPLP). Laboratory analysis of the SPLP leachate found no detectable chromium.

“Wash-in soil” will be used as backfill to reduce fall hazards of the steep hill slope at the South Mill Building. The material will be on a concrete slab, and covered with crushed concrete for erosion protection. The material from this pile will be kept distinct from other backfill so that it is not mixed with clean backfill and may be investigated during the RI. Based on the laboratory results, it is considered unlikely that remediation will be required for this soil. However, final determination of the need for remediation will be determined in the FS.

7.2 Overburden from the Clean Soil Borrow Area

Soil with elevated chromium concentrations (similar to other Site surface soils) is present over subsurface soil considered suitable as clean borrow near the North Mill Building (Drawing IAR-240). This overburden soil will be removed and stockpiled to allow access to the underlying clean soil. The design of this soil stockpile is shown on Drawing IAR-255. Stormwater controls for this stockpile are shown on Drawing IAS-525.

7.3 Stockpiles for Vegetated Soil and Chipped Vegetation

Clearing and grubbing during interim action will produce chipped vegetation and soil mixed with vegetation. Chipped vegetation (with no soil) and vegetated soil will be stockpiled separately on-Site. The approximate locations of these stockpiles are shown on Drawings IAS-510 and IAS-515.

8.0 REFERENCES

Golder Associates Inc. (Golder). 2007. *Draft Report on Mill Building Floor and Bin Sampling - Former Satralloy Site, Jefferson County, Ohio*. Golder Associates Inc. October 26.

Golder. 2012. *Health and Safety Plan for the Remedial Investigation - Former Satralloy Site, Jefferson County, Ohio*. Golder Associates Inc. August 3..

Lawhon and Associates (Lawhon). 2007. *Regulated Materials Survey: Specified Buildings – Former Satralloy Site, Jefferson County, Ohio*. Lawhon & Associates, Inc. May 18.

Lawhon. 2010. *Material Sampling May 12, 2010 Satralloy Site*. Letter report from Deborah Gray to Lee Holder. June 8.

State of Ohio. 2010. *Consent Order for Preliminary Injunction to Conduct a Remedial Investigation and Feasibility Study and to Pay Response Costs*. November 3.

TABLE

TABLE 1
Summary of Interim Action Activities

ID	Activity	Description	Relevant Drawings
1	**Rail Spur Subgrade Installation (est. months 1-3)**		
1a	Construct the Rail Spur Subgrade (both on- and off-Site)	Construction equipment will first be mobilized to the Site. The laydown areas and stockpiles will then be established. Next, areas will be cleared, grubbed, and graded as needed to establish the rail subgrade, ditches, drainage and culverts.	•IAT-618 to IAT-626 Grading and Drainage Plans •IAT-628 to IAT-632 Track Subgrade Profiles •IAR-320 Geotextile Placement Areas •IAS-520 & IAS-525 Stormwater Flow and Controls •IAS-540 Erosion and Sediment Controls
1b	Clearing and Grubbing Overview	Certain site areas such as the railroad laydown, organic layer and chipped vegetation stockpiles, rail spur corridor, clean borrow area, parking, trailer and entrance road locations will be cleared and grubbed. Clearing and grubbing will also occur on access roads/corridors and as part of installing temporary infrastructure (security kiosk, scale, tire wash, etc.). Sediment controls will be established as areas are grubbed. After an area is grubbed, if any rough grading is required it be done shortly thereafter. Drainage ditches will be cut in where applicable. Construction equipment will be traversing the Site to work in these locations.	•IAR-230 Facilities Layout Plant Area •IAR-310 Grading limits •IAR-320 Geotextile Placement Areas •IAS-510 Work and Disturbed Plant Area •IAS-515 Work and Disturbed Areas North Site Area •IAR-520 Stormwater Flow, Controls and Sampling Plan Plant Area •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details •IAT-618, 620, 622, 624 & 626 Rail Spur Grading & Drainage Plan
1c	Establish the Organic Layer Stockpile	A geotextile base will be placed and then grubbed material will be transported to and placed on the stockpile from various Site areas. The stockpile will be used throughout the project.	•IAR-230 Facilities Layout Plant Area •IAR-310 Grading Limits •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
1d	Establish the Railroad Laydown Area	The area will be graded and geotextile placed over the area. This will be one of the primary staging areas for equipment and supply materials early in the project, but may remain in use throughout the project.	•IAR-230 Facilities Layout Plant Area •IAR-310 Grading Limits •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
1e	Establish the Optional Railroad Laydown Area	This area will be constructed and used in the same manner as the Railroad Laydown Area. It will be constructed and expanded as needed.	•IAR-230 Facilities Layout Plant Area •IAR-310 Grading Limits •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
1f	Establish Chipped Vegetation Stockpiles #1 & #2	A geotextile base will be placed and then chipped vegetation will be transported to and placed on the stockpile from various Site areas. These stockpiles will be used throughout the project.	•IAR-230 Facilities Layout Plant Area •IAR-310 Grading Limits •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
1g	Establish 2 Railroad Tie Staging Areas	Existing railroad ties removed from the existing rail bed will be stockpiled in these two areas prior to off-Site disposal as non-hazardous waste.	•IAR-230 Facilities Layout Plant Area •IAR-315 Regrading Plan •IAR-320 Geotextile Placement Areas •IAR-325 Gravel Surfacing Placement
2	**Mobilization and Setup (est. months 1-3)**		
2a	Determine Disposition of "Actively Managed Piles"	"Actively Managed Piles" will be sampled and analyzed. Pile materials will be managed as specified in the IA Workplan depending on analytical results. Pile sampling will involve movement of materials in the piles with a backhoe or other suitable equipment. These piles may be moved where they interfere with other interim action activities.	•IAR-210 Actively Managed and Baghouse Dust Pile Locations •IAS-540 Erosion and Sediment Controls
2b	Establish Chipped Vegetation Stockpiles #3 & #4	A geotextile base will be placed and then chipped vegetation will be transported to and placed on the stockpile from various Site areas. These stockpiles will be used throughout the project.	•IAR-230 Facilities Layout Plant Area •IAR-310 Grading Limits •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
2c	Establish 2 Contractor Equipment Maintenance Pads	The existing concrete slab and surrounding area will be cleared of debris, slag, etc. These areas will be used to store equipment and materials, and for vehicle fueling and maintenance.	•IAR-315 Regrading Plan •IAR-320 Geotextile Placement •IAR-325 Gravel Surfacing Placement •IAS-540 Erosion and Sediment Controls
2d	Establish the Tire and Belly Wash	This area will be used throughout the project to clean equipment before it leaves the Site.	•IAR-230 Facilities Layout
2e	Establish Personnel Decontamination Areas	Personnel decontamination areas will be established in each Mill Building and a general use area near the Contractor Parking Lot. These areas will be used throughout the Project. Personnel will discard disposable PPE at these stations and perform any necessary decontamination.	•IAR-230 Facilities Layout
2f	Establish the Contractor Wastewater Treatment Plant	A package wastewater treatment plant will be used for on-site treatment and storage of wastewater generated by the abatement and demolition work. Treated water will be used on-Site for dust control. There will be no off-Site discharge.	•IAR-230 Facilities Layout

TABLE 1
Summary of Interim Action Activities

ID	Activity	Description	Relevant Drawings
2g	Set the Temporary Scale	This area will be cleared and leveled before the scale is placed. The scale will be used to weigh loads (inbound and outbound) as needed.	•IAR-230 Facilities Layout
2h	Set the Security Kiosk	A prefabricated security kiosk will be installed. This station will be manned throughout the project to monitor traffic, deliveries, and personnel entering and leaving the Site.	•IAR-230 Facilities Layout
2i	Develop the Trailer and Parking Area	Field Office trailers, personnel wash stations, and parking areas will be set up for use throughout the project.	•IAR-230 Facilities Layout
2j	Establish the Clean Laydown Area	The area surrounding the Field office trailers will be graded to establish even drainage. This area will be used for storage of equipment and materials throughout the project.	•IAR-230 Facilities Layout
2k	Reconstruct the Construction Entrance	The entrance into the Site will be reconstructed. The entry will have construction fencing on each side to keep personnel on the roadway up to the Security Kiosk. Drainage will be installed on each side of the roadway. This will be the primary entrance for personnel and deliveries into and out of the Site.	•IAR-230 Facilities Layout •IAR-250 Post-Demolition Fencing Plan •IAR-320 Geotextile Placement Areas •IAR-325 Gravel Surfacing Placement Areas •IAS-545 Erosion and Sediment Control Details
2l	Repair Site Roads as Needed	Roads throughout the Site (plant area and uplands) will be repaired as needed. Roads will be used throughout the project. Site roads are constructed of slag, gravel, and soil. Slag will be used as hard fill in the repairs.	•IAR-230 Facilities Layout •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
2m	Set up the Slag Borrow Area	An existing slag pile will be used as a source of slag for repairing on-Site roads. The area surrounding the stockpile will have truck traffic throughout the project.	•IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
2n	Establish the Contractor Personnel Clean Walkway	A clean gravel walkway will be constructed over existing slag and soil to allow personnel installing the rail spur to access the rail spur work area without walking on contaminated areas. This walkway will only be maintained until the rail spur is installed.	•IAR-315 Regrading Plan •IAR-320 Geotextile Placement Areas •IAR-325 Gravel Surfacing Placement Areas
2o	Construct the Contractor Personnel Parking Area	The parking lot will be constructed in two phases. The first phase will be for initial setup and rail spur installation, and then the lot will be expanded for subsequent work. The parking area will be used throughout the project.	•IAR-315 Regrading Plan •IAR-320 Geotextile Placement Areas •IAR-325 Gravel Surfacing Placement Areas
2p	Develop the Clean Soil Borrow Areas	This area will be cleared and grubbed, and overburden soil and placed on the Clean Overburden Stockpile. The area will be developed as needed (A will be used first, B will be used second, etc.). Drainage will be constructed to keep the working area well drained. This area will be accessed throughout the project.	•IAR-320 Geotextile Placement Areas •IAS-540 Erosion and Sediment Controls
2q	Establish the Clean Overburden Stockpile	The area will be cleared, grubbed, graded and have a geotextile set to established an area to place the overburden from the Clean Soil Borrow Area. This stockpile will be used throughout the project and expanded as needed.	•IAR-255 Soils and Baghouse Dust Staging Area Details •IAR-320 Geotextile Placement Areas •IAS-540 Erosion and Sediment Controls
3	**Install Rail Spur (est. months 1-4)**		
3	Construct the Rail Spur	Connect new track at the #15 Switch located on the W&LER main line and continue laying new track along the newly constructed rail bed. Once the track is installed additional stone/gravel will be brought on the site to finish the rail loading area and entrance road and parking areas.	Multiple
4	**Abatement (est. months 2-14)**		
4a	Clean the Mill Buildings, Other Buildings, and Associated Structures	Debris, litter, and loose dust will be removed from Site buildings and associated structures.	Multiple
4b	Construct the Baghouse Dust Staging Area	A lined staging area will be constructed on a concrete pad near the North Mill Building. The area will be used to stage dust collected in bags from the Mill Buildings and associated structures. This area will be constructed in a progressive mode as dust is collected. The area will be used and maintained until disposition of the dust per the selected final Site remedy.	•IAR-255 Soils and Baghouse Dust Staging Area Details •IAR-260 Baghouse Dust Staging Area Fencing Details •IAS-520 Stormwater Flow and Controls •IAS-540 Erosion and Sediment Controls
4v	Remove Transite and Siding from Mill Buildings	Transite and other asbestos-containing materials (ACM), as well as non-ACM siding materials, will be removed. This will include removal of lead bolt covers.	Multiple

TABLE 1
Summary of Interim Action Activities

ID	Activity	Description	Relevant Drawings
5	**Impacted Soil Removal (est. months 1-6)**		
5	South Mill Building Wash-In Soils	"Wash-in soil" will be used as backfill to reduce fall hazards of the steep hill slope at the South Mill Building. The material will be on a concrete slab, and covered with crushed concrete for erosion protection. The material from this pile will be kept distinct from other backfill so that it is not mixed with clean backfill and may be investigated during the RI. Based on the laboratory results, it is considered unlikely that remediation will be required for this soil. However, final determination of the need for remediation will be determined in the FS.	•IAR-250 Post-Demolition Fencing and Mill Building Backfill Plan
6	**Demolition North & South Mill Buildings (est. months 8-14)**		
6a	Demolish North Mill Building	Once all abatement and siding removal is completed the steel frame will be demolished, sorted and stockpiled for rail transport to a recycling facility or steel mill	•IAS-240 Demolition Plan Plant Area •IAS-520 Stormwater Flow and Controls •IAS-540 Erosion and Sediment Controls
6b	Demolish South Mill Building	Once all abatement and siding removal is completed the steel frame will be demolished, sorted and stockpiled for rail transport to a recycling facility or steel mill	•IAR-255 Soil and Baghouse Dust Staging Area Details •IAS-240 Demolition Plan Plant Area •IAS-540 Erosion and Sediment Controls
7	**Demolition Auxiliary Structures (est. months 8-16)**		
7a	Demolish Water Tank	The tank will be taken apart. Wooden staves will be stockpiled. Lead will be collected and staged for off-Site recycling.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7b	Demolish the Cooling Towers	The structure will be removed and structure materials recycled or disposed off-Site. The concrete floors will be broken to allow drainage. The basins will be filled with clean backfill.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7c	Demolish the Cooling Water Supply Plant	After abatement, the structure will be demolished. Masonry block from the building may be crushed and used for clean backfill.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7d	Demolish the Administration Building	After abatement, the structure will be demolished. Masonry block from the building may be crushed and used for clean backfill.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7e	Demolish Wastewater Treatment Plant and Holding Basin	After abatement, the structures will be demolished. Masonry block from the building may be crushed and used for clean backfill. Steel tanks will be cleaned, dismantled, and stockpiled for recycling. For the below-grade concrete basin, the floor will be broken to allow drainage and the basin filled with clean backfill to grade.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7f	Partial Demolition of the Electrical Control Room	The upper level of this building will be removed. Exposed foundations in the switchyard will be removed. The lower part of the building will be filled with clean backfill. Masonry block and concrete footings may be crushed and used for clean backfill.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7g	Demolish Baghouses	After abatement, the baghouse structures will be demolished and the steel prepared for recycling. The above-grade portions of the concrete foundations will be removed and may be cleaned and crushed for clean backfill.	•IAR-255 Soils and baghouse Dust Staging Area Details
7h	Demolish Mill Building Silos	After abatement, the structures will be demolished. The concrete silos and above-grade foundations will be removed and may be cleaned and crushed for clean backfill.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7i	Demolish Offgas Piping	After abatement, the structures will be demolished. The concrete silos and above-grade foundations will be removed and may be cleaned and crushed for clean backfill.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7j	Demolish Slurry Processing Plant	After abatement, the structures will be demolished. The concrete silos and above-grade foundations will be removed and may be cleaned and crushed for clean backfill.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan
7k	Laboratory Building	After abatement, the collapsed building will be demolished and clean backfill used to contour the area.	•IAR-230 Facilities Layout •IAR-240 Demolition Plan

TABLE 1
Summary of Interim Action Activities

ID	Activity	Description	Relevant Drawings
7l	Demolish the North Concrete Bins and Railroad Trestle	Existing materials in the concrete bins will be moved onto the concrete pad in front of the bins. The steel in the rail structure will be removed and prepared for recycling. The concrete bins will be demolished. The concrete may be cleaned and crushed for use as clean backfill.	•IAR-270 Bin Bulkhead Detail •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
7m	Demolish the South Bins and Railroad Trestle	The rail and concrete bin walls will be removed to the grade of the surrounding slag. The steel will be prepared for recycling. Concrete may be cleaned and crushed for use as clean backfill.	•IAR-270 Bin Bulkhead Detail •IAS-540 Erosion and Sediment Controls •IAS-545 Erosion and Sediment Control Details
7n	Remove the Slurry Pipeline	Remove the above and underground portions of the pipeline including the slurry tower and platform. The steel will be prepared for recycling.	•IAR-310 Clearing and Grubbing Plan.
7o	Demolish the Transmission Towers	These structures will be demolished and the steel prepared for recycling. The concrete footings will be covered with surrounding soil and graded to match the existing contour.	•N/A
7p	Metal and Lead Recycling	Steel and other metals (including lead) will be sorted into categories and transported by rail to recycling facilities and/or steel mills.	•N/A
7q	Off-Site Disposal of Abatement Materials	Regulated materials (except dust placed in the on-Site staging area) will be disposed of off-Site at appropriately permitted facilities.	•N/A
7r	Other Off-Site Disposal	Construction & Debris (C&D) wastes, debris, general trash, and other materials designated for off-Site disposal will be disposed off-Site at appropriately permitted facilities.	•N/A
8	**Demobilization (est. months 12-16)**		
8	Demobilize from the Site	As major portions of work are completed (i.e. all abatement or demolition) the Contractor will transport off the site the associated equipment, materials and supplies. As the project closes out the Contractor will then remove the last of his equipment and supplies as well as field office trailers	•N/A

APPENDIX A
AOC LETTER

October 19, 2012

JEFFERSON COUNTY
SATRALLOY
CORRESPONDENCE FILE

Ms. Barbara Nielsen
Manager, Remediation Division
Freeport-McMoRan Copper & Gold, Inc.
On behalf of Cyprus Amax Minerals Company
333 N. Central Avenue
Phoenix, AZ 85004

Re: Designation of an Area of Contamination (AOC)
Former Satralloy Site
County Road 74, Cross Creek Township, Jefferson County, Ohio

Ms. Nielsen:

This letter follows our August 23, 2012, letter with comments on the April 26, 2012, draft Interim Action (IA) Work Plan, and our September 25, 2012, meeting to discuss application of U.S. EPA's Area of Contamination (AOC) Policy at the Former Satralloy Site (Site). Cyprus Amax Minerals Company (Cyprus) has requested that Ohio EPA designate the entire Site (as the term "Site" is defined in the Consent Order for Preliminary Injunction (COPI)) as an AOC, and provided visual (*e.g.*, "9/16/12" photographs) and technical evidence (*e.g.*, "9/18/2012" Figure 1-1 "Lowlands") of contiguous Site-wide contamination to support this request.

I have consulted with staff in Ohio EPA's Office of Legal Services and Ohio EPA DERR's Central Office, including Assistant Chief Pete Whitehouse, and this letter is consistent with those discussions. Ohio EPA acknowledges that Cyprus has demonstrated that contamination appears to be present across the Site in the continuous and contiguous fashion that designation of the AOC requires, and thus we conclude that the AOC concept is applicable. In the event that Cyprus is able to demonstrate in the future, to the satisfaction of Ohio EPA, that continuous and contiguous contamination is present in additional locations on or off the Satralloy property, the Agency acknowledges that the AOC concept would be applicable to such areas as well.

In our view, when an AOC is designated in the context of a government overseen cleanup action, the delineation of AOC is reviewed, overseen and approved as part of that action. In most cases, the AOC is designated in a remedy decision, allowing certain remedial actions to proceed in a specified area without triggering RCRA hazardous waste requirements, including land disposal restriction requirements (LDRs).

In this case, we have concluded that a properly designated AOC would be identified by Cyprus and submitted as part of a plan (*e.g.* IA Work Plan, RI/FS Work Plan) pursuant to the COPI, which would specify the work to be performed and how the AOC would be employed. Upon approval of the Agency, the plan would be implemented, and the designated AOC would apply.

We hope this letter clarifies Ohio EPA's position regarding application of the AOC concept at the Satralloy Site. We think this concept can be most useful across the entire Site, as noted above.

Given that the next deliverable under the COPI, the IA Work Plan, was held up pending the clarifications requested in this letter, you are now requested pursuant to paragraphs 12 and 13 of the COPI to submit the Final IA Work Plan with 30 days of receipt of this letter. If you have any questions, or require clarification, please feel free to contact me at your convenience.

Sincerely,

Michael D. Sherron
Site Coordinator
Michael.Sherron@epa.state.oh.us
740-380-5251

ec: John Rochotte, DERR-SEDO
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APPENDIX B
PERIMETER AIR MONITORING WORKPLAN

Perimeter Air Monitoring Workplan

for the

FORMER SATRALLOY SITE
Jefferson County, Ohio

Submitted to:

Ohio Environmental Protection Agency
2195 Front Street
Logan, Ohio 43138

Submitted by:

Cyprus Amax Minerals Company
333 North Central Avenue
Phoenix, Arizona 85004

Prepared by:

Lawhon & Associates, Inc.
Westerville, Ohio 43081
(614) 818-5200

April 26, 2012
Revised

Table of Contents

Tables

Figures

1.0 Introduction

This document is the workplan for perimeter air monitoring during interim actions at the Former Satralloy Site (the Site), located in Cross Creek Township, Jefferson County, Ohio.

1.1 Background

The Site consists of approximately 330 acres of land and includes an abandoned ferrochromium alloy processing plant. The Site is located on County Road 74 (Gould Road) in Cross Creek Township, Jefferson County, Ohio, approximately four miles southwest of Steubenville. Access to the Site is via Gould Road (see Figure 1).

The former Satralloy plant has been closed for decades and was formerly used for processing ferrochromium ores. Based on Site history, Site reconnaissance and preliminary investigations, the buildings and residual materials are believed to contain varying concentrations of chromium (Cr), asbestos-containing materials (ACM) and other inorganic constituents including arsenic (As), lead (Pb), and silica.

Cyprus Amax Minerals Company (Cyprus) is planning to perform interim actions as described in the Interim Action Workplan prepared by Golder Associates Inc. (Golder) and submitted to the Ohio Environmental Protection Agency (OEPA). These interim actions include abatement of chromium-containing dust and regulated materials in Site buildings, followed by demolition of these buildings. This Perimeter Air Monitoring Workplan is being submitted to OEPA concurrently with the Interim Action Workplan.

1.2 Purpose and Scope

The purpose of this workplan is to describe ambient air monitoring to be performed at the perimeter of the Site during interim actions.

This workplan describes:

- Constituents of potential concern (COPCs) to be monitored;
- Risk based screening levels;
- Sampling and analytical methods;
- Monitoring equipment and locations;
- Monitoring schedule;
- Monitoring procedures; and,
- Data management.

The purpose of the perimeter air monitoring is to detect and, if present, to quantify ambient air parameters during demolition and other interim actions. Ambient air sampling for COPCs, as well as, monitoring Particulate Matter ($PM_{2.5}$, PM_{10} and Total Suspended Particulate [TSP]) will be conducted during demolition activities in order to:

- Determine if COPCs are being released during Site interim action activities.
- Confirm that COPCs, if released, are not migrating from the Site at levels of public health concern during Site demolition activities.

The proposed placement of the monitoring sites will provide upwind/downwind-specific data so that contributions from background sources can be quantified. The results of the monitoring and sampling will be compared to the Maximum Acceptable Ground-Level Concentrations (MAGLCs), developed using the OEPA's air toxics policy methodology, or to National Ambient Air Quality Standards (NAAQS), or to occupational exposure limits, whichever are available and appropriate (Table 1; Summary of Methods and Detection Limits for Ambient Air Samples).

1.3 Constituents of Potential Concern

Prior Site investigations were used as the basis for identifying COPCs for air monitoring; these investigations are documented in the *Draft Preliminary Evaluation Report and Remedial Investigation/Feasibility Study Workplan for the Former Satralloy Site*, Golder Associates Inc., December 17, 2010 (Golder 2010a) under review by OEPA. Based on these investigations, the following constituents have been identified in Site soils, buildings and/or slag piles and, therefore, are COPCs for airborne release and/or migration during structural abatement and demolition:

- Chromium
  - Hexavalent chromium (chromium VI) has not been detected in slag or soil samples from the Site. However, chromium VI has been detected in water leaving the site. Therefore, although the chromium at the Site is primarily in trivalent form (chromium III), and considering the toxicity of chromium VI, chromium VI is included along with total chromium for air monitoring.
- Lead
- Arsenic
- Asbestos Containing Material
- Quartz and Silica compounds

2.0 Data Quality Goals and Objectives

The Data Quality Objective for this project is to monitor the ambient air within and at the perimeter of the Satralloy Site for COPCs in a manner sufficient to evaluate whether these constituents are migrating off-Site at levels of potential public health concern.

The purpose of the perimeter air monitoring is provided in Section 1.2 of this document.

Sampling locations have been selected to allow characterization of the relative contribution, if any, to ambient air particulate matter associated with regional background sources, existing slag piles on Site and from the abatement and demolition of Site structures. Validated sampling and analysis methods will be used to determine airborne concentrations at the perimeter of the Site.

Data will be collected in a manner consistent with the existing, Site-specific Quality Assurance Program Plan submitted to OEPA (Golder 2010b). On a daily basis, the monitored and sampled data will be reviewed and compared against established PM_{10} benchmark screening levels (proposed as the average baseline concentration plus two standard deviations). An automatic alarm system will alert on-Site personnel if the PM_{10} benchmark screening levels have been exceeded at a given monitoring location. Data will be collected, evaluated and incorporated into a central database on a weekly basis.

3.0 Sampling and Analysis

Sampling and analysis methods used in this project will follow EPA, National Institute of Occupational Safety and Health (NIOSH), or Occupational Safety and Health Administration (OSHA) methods and protocols. Table 1 contains the specific analytical methods to be employed for each COPC. Analytical results from the on Site monitoring and sampling representing eight-hour concentrations will be compared to Ohio EPA MAGLCs developed using the Ohio EPA Air Toxics Policy methodology. These values are derived from the American Conference of Governmental Industrial Hygienists-Threshold Limit Value (TLVs), which are defined as the threshold level (concentration) of a chemical substance, to which it is believed a worker can be exposed day after day, for a working lifetime, without adverse health effects. The MAGLC calculation adjusts the TLV to continuous exposure and adds a safety factor for sensitive populations. The proposed MAGLCs for the COPCs are summarized in Table 1.

3.1 Ambient Air Monitoring Goals and Objectives

Four (4) monitoring stations have been installed on-Site, located as shown on Figure 2. Each station will continuously monitor PM_{10}, along with contemporaneous meteorological conditions (relative humidity, temperature, wind speed and wind direction at an elevation of 2 meters). Air samples will be collected onto filter cassettes during active Site demolition. The placement of these stations has been selected based on Site topography, prevailing wind direction in the area, locations of existing slag on Site and the intent of monitoring air at the Site perimeter. The co-located meteorological stations will be used to determine the position of the sampling locations relative to concurrent Site activities (e.g. upwind/downwind/crosswind). The information will be used to identify and quantify the relative contributions to airborne particulate matter from alternate background sources and/or slag as opposed to any releases during abatement and demolition. In addition, meteorological data may be used to validate or further refine the positioning of monitoring stations on Site. A fifth meteorological station has been installed on the hillside north of the existing buildings, as shown on Figure 2. This station will be elevated to approximately two (2) meters and is intended to provide general Site meteorological data. Data from the four (4) monitoring stations and the elevated meteorological station will be relayed by telemetry to a central location with access from the on-Site construction trailer and remote access capabilities.

Monitoring Phases

Monitoring and ambient air sampling will consist of three phases:

- Phase I – Baseline Monitoring
- Phase II – Demolition Monitoring
- Phase III – Post-Demolition Monitoring

3.1.1 Phase I – Baseline Monitoring

Baseline sampling consists of two components: 1) continuous monitoring and 2) daily sampling.

Baseline monitoring will be conducted over a one to two week period (depending upon weather conditions) prior to initiation of abatement and demolition of the mill buildings and associated structures.

- Continuous 24-hour recording of PM_{10} by the 4 fixed monitoring instruments with telemetry to a central location;
- Recording of simultaneous $PM_{2.5}$, PM_{10} and TSP size fractions using a roving hand-held instrument during the time that samples for laboratory analysis of COPCs are being collected;
- Continuous monitoring of wind speed, wind direction, relative humidity, temperature, and barometric pressure;
- For each day of baseline monitoring, four sets of 8-hr samples will be submitted for laboratory analysis of COPCs (arsenic, total chromium, and lead, silica and asbestos). The samples will represent conditions upwind and downwind of the slag piles, and upwind and downwind of the mill buildings. Two sets of blanks collected on different days will also be submitted to the laboratory. The baseline monitoring will be collected on five (5) consecutive weekdays (weather permitting) or on five occasions over two consecutive weeks;
- Document variability in PM_{10} concentrations at the site prior to demolition activities;
- Establish the relative contributions of the COPCs (As, Pb, Cr, silica, and asbestos), if present, in the total suspended particulate (TSP) collected at the site; and,

- Calculate a representative mean plus two standard deviations of baseline PM_{10}, which will serve as the threshold concentration of PM_{10} that can be used as an indicator of the potential for an increase in off-Site ambient particulate concentrations. If PM_{10} levels exceed the threshold, then:
    - Site managers will be alerted of the potential need to modify on-Site dust mitigation strategies; and,
    - The collection of cassette samples for laboratory analysis will be initiated.

A secondary objective of the baseline monitoring is to determine if the on-Site slag piles contribute to concentrations of ambient particulate and COPCs (specifically metals and silica) that is separate from particulates originating from other on-Site sources (e.g., mill buildings).

3.1.2 Phase II – Demolition Monitoring

The objectives of monitoring during the abatement and demolition activities are to: 1) confirm that dust controls are effective and 2) document that any particulate releases associated with the demolition activities do not present an unacceptable risk to the surrounding community. The protocols for collecting samples for laboratory analysis and documentation of PM size fractions during sampling are the same as for the baseline monitoring. The major features proposed for the demolition monitoring program are:

- Continuous and Supplemental Monitoring: Continuous 24-hour monitoring of PM_{10}, and meteorological conditions with data telemetry and warning alarm when the PM_{10} trigger level is exceeded; and supplemental recording of PM size fractions during sample collection;

- Representative or Weekly Sampling: Weekly on-Site sampling events will be coordinated with the demolition contractor's schedule. It may be practical to represent specific stages of demolition activity by sampling at a frequency that is either less than one time per week (consistent type of activities and low release potential) or multiple days of sampling in one week (high release potential activities);

- Excursion Sampling/Monitoring: If the PM_{10} levels at a monitoring station exceed the trigger level for more than a specified length of time as determined by the baseline conditions, automated sample collection will be initiated;

- Intensive Demolition Monitoring: May be required if significant potential for off-Site release of particulates is observed; and,

- A DustTRAK DRX unit will be deployed when a scientist/technician is onsite for weekly sampling.
    - The unit will be mobile and samples will be used to collect data at all monitoring/sampling locations throughout the day.
    - Data collected from the unit will be used to:
        - Characterize particulate fractions in ambient air to be used in a public health evaluation; and,
        - Ensure quality assurance/quality control (QA/QC).

3.1.3 Phase III – Post-Demolition Monitoring

The purpose of the Post-demolition monitoring is to demonstrate that the Site air has returned to levels comparable to baseline characteristics. The objectives of post-demolition monitoring and sampling are to:

- Verify and document that PM_{10} levels observed after cessation of demolition do not exceed PM_{10} levels observed at baseline; and,
- Ensure and document that any ambient particulate concentrations do not present an unacceptable risk to the local residents.

It is anticipated that documentation of post-demolition conditions will last one to two weeks, depending upon weather conditions.

3.2 COPC Sampling Plan

$PM_{2.5}$, PM10, and TSP data will be collected using a direct-read aerosol monitor with data-logging capabilities (TSA DustTrak DRX, or equivalent) during the three phases of this project. Cassette samples will also be collected for 8-hour periods during workday hours and will be available for laboratory analysis.

The results of the real-time monitoring and the sampling will be used to determine the relationship between the TSP values and the analytical results. Based upon this relationship, a screening TSP benchmark concentration can be calculated, which may be used to support the evaluation of the suitability of engineering controls used on Site. This screening concentration will be selected as the TSP concentration at the maximum COPC concentration measured that just meets the MAGLC for that constituent. The lowest MAGLC will be controlling.

This sampling strategy is intended to minimize the frequency of sampling and analysis during Phase II. The frequency of analytical sampling for specific constituents of concern will be adjusted as needed based upon TSP readings. Samples will be collected and analyzed for COPCs as discussed below.

3.2.1 Chromium

NIOSH 7300 will be used to analyze TSP samples for total Cr. This method uses cassettes equipped with 37-mm filters. Filters are analyzed by means of an Inductively Coupled Argon Plasma-Atomic Emission Spectroscopy (ICP-AES). At the target flow rate of 2 liters per minute (L/min), the estimated limit of detection is 0.000021 milligrams per cubic meter (mg/m^3). This method and detection limit meets the data quality objective for comparing concentrations of total Cr in ambient PM to the proposed Ohio MAGLC of 0.012 mg/m^3.

In the event that Cr is found to be present in TSP from the site, OSHA method ID-215 will be used to quantify Cr. An air sample is collected using a 37-mm diameter polyvinyl chloride (PVC) filter with a 5-µm pore size contained within a polystyrene cassette. Appropriate samples for speciation of Cr VI will be collected and archived in the event that actual laboratory analysis is warranted based on the presence of total Cr.

3.2.2 Arsenic and Lead

NIOSH Method 7300 will be used for Pb- and As-containing airborne particulates. At the target flow rate of 2 L/min the estimated limit of detection is 0.000146 mg/m^3 for As and 0.000065 mg/m^3 for Pb. The detection limits of this method meet the data quality objectives for As and Pb.

3.2.3 Asbestos

NIOSH method 7400 will be used for asbestos particulates. A known volume of air is drawn through a 25-mm diameter cassette containing a filter. The cassette must be equipped with a conductive extension cowl. At the target flow rate of 2 L/min the estimated limit of detection is 0.1fibers per cubic centimeter (f/cc). Filters are analyzed for asbestos by fiber counting using

Light Microscopy, Phase Contrast and reported as crocidolite, amosite, or chrysotile. Although individual MAGLCs can be calculated (and are shown in Table 1) based on TLVs for the three types of asbestos fibers, evaluation of potential off-Site exposures will be based on the occupational exposure limits.

3.2.4 Silica

NIOSH method 7500 will be used to analyze for crystalline silica particulates. A cyclone and filter combination is used with a low flow sample pump at a target flow rate of 2 L/min. At the target flow rate of 2 L/min. the estimated limit of detection is 0.005 mg/m^3. This detection limit corresponds to the ACGIH TLV for respirable crystalline silica. Although individual MAGLCs can be calculated (and are shown in Table 1) based on the TLVs for quartz, chrystobalite and trydmite, evaluation of potential off-Site exposures will be based on levels of total respirable crystalline silica.

4.0 Field Sampling

Each sampling location will be set up with a NEMA 4 weather tight enclosure. The monitoring instrument selected for the fixed stations will be set up for continuous 24-hour monitoring of PM_{10} and meteorological variables (wind speed, wind direction, relative humidity and temperature). Sampling pumps that can be automatically activated by telemetry will draw air into the appropriate sample cassettes provided by the analytical methods. The sampling system will be powered by two (2) 12-volt battery. These batteries are connected to solar panels to maintain a full charge ad infinitum, permitting the continuous monitor to operate and to allow the pump to run for the air cassette samples. A schematic drawing of the environmental monitoring unit is located in Figure 3; Schematic Environmental Monitoring Unit.

4.1 Set-up and Collection of Samples

The following steps are taken during a sampling event.

- Inspect and conduct any required maintenance on the monitoring units:
  - Assure the unit is in working order;
  - Set up continuous monitor to sample appropriate particulate channels;
  - Link continuous monitor to tubing that penetrates the sample enclosure;
  - Start continuous monitor and data logging; and,
  - Repeat for other sample stations
- Verify continuous monitor is operating;
- Prepare cassette samples:
  - Determine pre-calibrated sample pump is using the correct flow based on the sample methods; use an electronic dry-piston flow meter to calibrate sampling pumps to correct flow;
  - Uncap or open cassettes and immediately connect cassette outlet to pump tubing and connect cassette inlet to tubing located outside the sample enclosure; (repeat step for remaining cassettes);
  - Verify the cassettes are properly placed; follow the printed arrow or directions detailed on the cassettes;
- Visually inspect for loose connections;
- Visually inspect inside and outside of sampling unit;
- Verify the unit pump is in the ON position; and,
- Repeat for the remaining stations.

The amounts of tubing are to be minimized to limit the potential for interferences. In addition, the sample ports will be designed to minimize the potential for accidental collection of water droplets.

4.2 *Sample Labeling and Preparation*

The scientist or technician will initiate the Chain of Custody by generating a unique identification labels for each sample cassette using the following convention:

- Monitoring location
- Collection start/stop time
- Date of monitoring event
- Pump number
- Sample type (ICP for Cr, As, or Pb, asbestos, or silica)

Additionally, labels for the field blanks must be created, including the following:

- The date of the monitoring event
- The letters "FB" placed after the date code

Collecting the air sample cassettes

- Turn sample pump to OFF
- Remove sample cassette and cap both ends immediately
- Place proper label on sample
- Place cassette into zip lock bag
- Label bag with monitoring location and date code in indelible ink
- Seal bag and place into transport container
- Seal outside tubing
- Repeat for remaining cassettes
- Record end times, Site conditions, and any other information that may have changed since the beginning of the sampling
- Secure unit for next sampling event

Prepare field blanks as follows:

- Uncap both ends of the cassette exposing the blank to environment of sampling location
- Cap the ends immediately
- Place proper label on tube
- Place in zip lock bag for that location

4.3 *Submitting Samples to the Laboratory*

The procedures below will be followed when submitting samples to the analytical laboratory:

- Complete and sign the laboratory Chain of Custodies for the air cassette samples and blanks
- The completed Chain of Custodies are to be placed in a zip-lock bag and packed in the transport container
- Safely pack cassettes for shipping in transport container
- Complete the shipping label
- Place a FedEx label onto transport container, retain a copy of the Chain of Custodies and shipping label for the project file, and submit a copy of the shipping label to the Accounting Department

- Using packaging tape, prepare transport container for shipping
- Place transport container at a FedEx drop-off location.

The samples will be sent to EMSL Analytical, Inc., a certified American Industrial Hygiene Association (AIHA) laboratory, and analyzed for COPCs by the methods previously specified.

5.0 Data Management

Continuous PM_{10} and meteorological data will be transmitted by telemetry to a central location. The telemetry data will be accessible to both on-Site and designated off-Site personnel. Particulate monitoring data will be summarized by location on a daily basis using a one-hour maximum, 8-hour-daytime-integrated average, and 24-hour-integrated average. Each station will be designated as upwind, downwind, or cross-wind based upon its location relative to the to-be-demolished buildings on the respective date. Data will be presented in both tabular and graphical formats.

Laboratory analytical reports will reviewed to identify any quality assurance / quality control issues, potentially anomalous results, and results incorporated into the database. Concentrations of COPCs will be compared to Ohio MAGLCs, NAAQS or occupational exposure standards to identify any potential for impacts to the surrounding community.

Table 1. Analytical Methods and Health-Based Screening Levels for COPCs

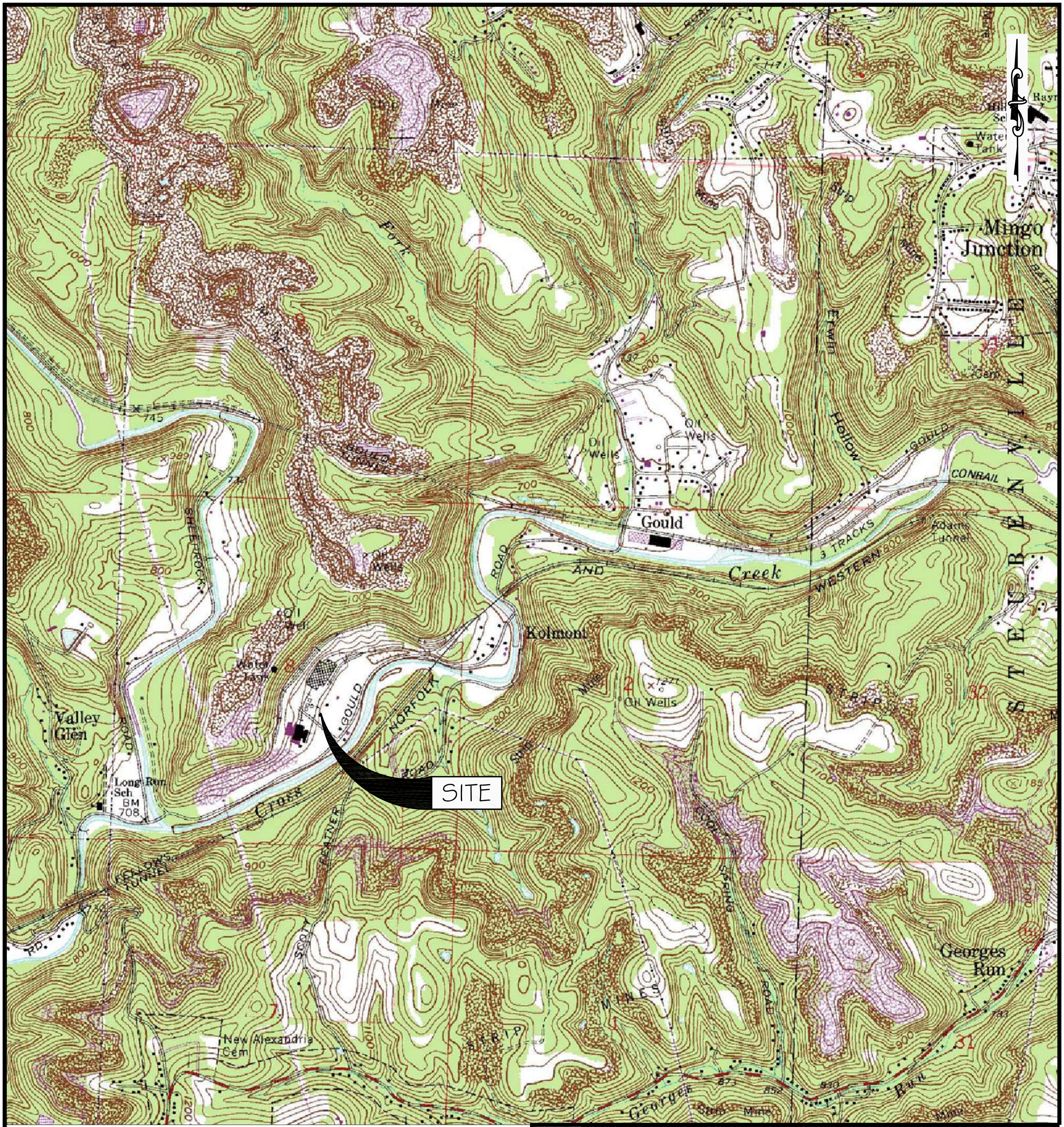
COPC	Sample Method	LAB	Method LOD	Target Flow Rate L/min	Sample Time min	Reporting Limit mg/m3	ACGIH - TLV mg/m3	MAGLC[9] mg/m3	NAAQS ug/m3
Metals[1]									
Arsenic[1]	NIOSH 7300	EMSL	0.14 ug/filter	2 L/min	480 min	1.46E-04	0.01	0.0002	--
Chromium (Total)[1]	NIOSH 7300	EMSL	0.02 ug/filter	2 L/min	480 min	2.10E-05	0.5	0.012	--
Chromium (VI)[2]	OSHA ID-215	EMSL	--	2 L/min	480 min	3.00E-06	0.0005	0.000012	--
Lead[1]	NIOSH 7300	EMSL	0.062 ug/filter	2 L/min	480 min	6.50E-05	0.05	0.0012	0.15 [7]
Silica[3]	NIOSH 7500	EMSL	5 ug/filter	2 L/min	480 min	5.00E-03	Quartz 0.1 mg/m3	0.0024[4]	--
							Chrystabolite 0.05 mg/m3	0.00119[4]	--
							Trydmite 0.05mg/m3	0.00119[4]	--
Asbestos[3]	NIOSH 7400	EMSL	0.001 f/cc	2 L/min	480 min	0.1 f/cc	Crocidolite 0.2f/cc	0.0048f/cc[4]	--
							Amosite 0.5f/cc	0.012f/cc[4]	--
							Chrysotile 2f/cc	0.048f/cc[4]	--
Particulate	Dustrak 8533								
PM2.5[5,6]	Direct Read	Data Logger			1,440 (continuous)		--	--	35
PM10[5,6]	Direct Read	Data Logger			1,440 (continuous)		--	--	150
TSP	Direct Read	Data Logger			1,440 (continuous)		--	--	--
Dust[8]	Direct Read	Data Logger			1,440 (continuous)		--	--	15,000

1. TLV value: Source is from CDC NIOSH Method 7300 Documentation: http://www.cdc.gov/niosh/docs/2003-154/method-8000.html
2. TLV Value: Source is from ACGIH TLV for Strontium Chromate (the most conservative TLV for chromium compounds)
   ACGIH TLV for soluble Cr(VI) - 0.05 mg/m3
   ACGIH TLV for insoluble Cr(VI) - 0.01 mg/m3
3. TLV value: Source is from CDC NIOSH Method 7500 Documentation: http://www.cdc.gov/niosh/docs/2003-154/method-8000.html
4. Note that calculated MAGLC < Reporting Limit < TLV. TLV will be used for initial screening.
5. Based upon 24 hour averaging period
6. Continuous monitoring using TSI 8533 DusTrak DRX (or equivalent): Range 0.001….150mg/m3, particle size 0.1 to 15micron
7. 3-month rolling average
8. TWA http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9994&p_text_version=FALSE
9. Analytical results from the on-Site monitoring and sampling representing one-hour concentrations will be compared to MAGLCs

ACGIH-TLV American Conference of Governmental Industrial Hygienists-Threshold Limit Value
Defined as: The threshold limit value (TLV) of a chemical substance is a level to which it is believed a worker can be exposed day after day for a working lifetime without adverse health effects.

MAGLC: Maximum Allowable Ground Level Contamination (OHIO AIR TOXICS POLICY)
Re-weights the ACGIH-TLV (by a factor of 1/42) for continuous exposure and sensitive populations

LOD: Limit of Detection
NAAQS: National Ambient Air Quality Standards
PM2.5: Particulate matter of 2.5 microns or smaller
PM10: Particulate matter of 10 microns or smaller
TSP: Total Suspended Particulate



975 Eastwind Drive, Suite 190

Westerville, Oh. 43081

Ph. (614) 818-5200

Fax (614) 818-5219

FIGURE 1

SITE LOCATION MAP

SATRALLOY

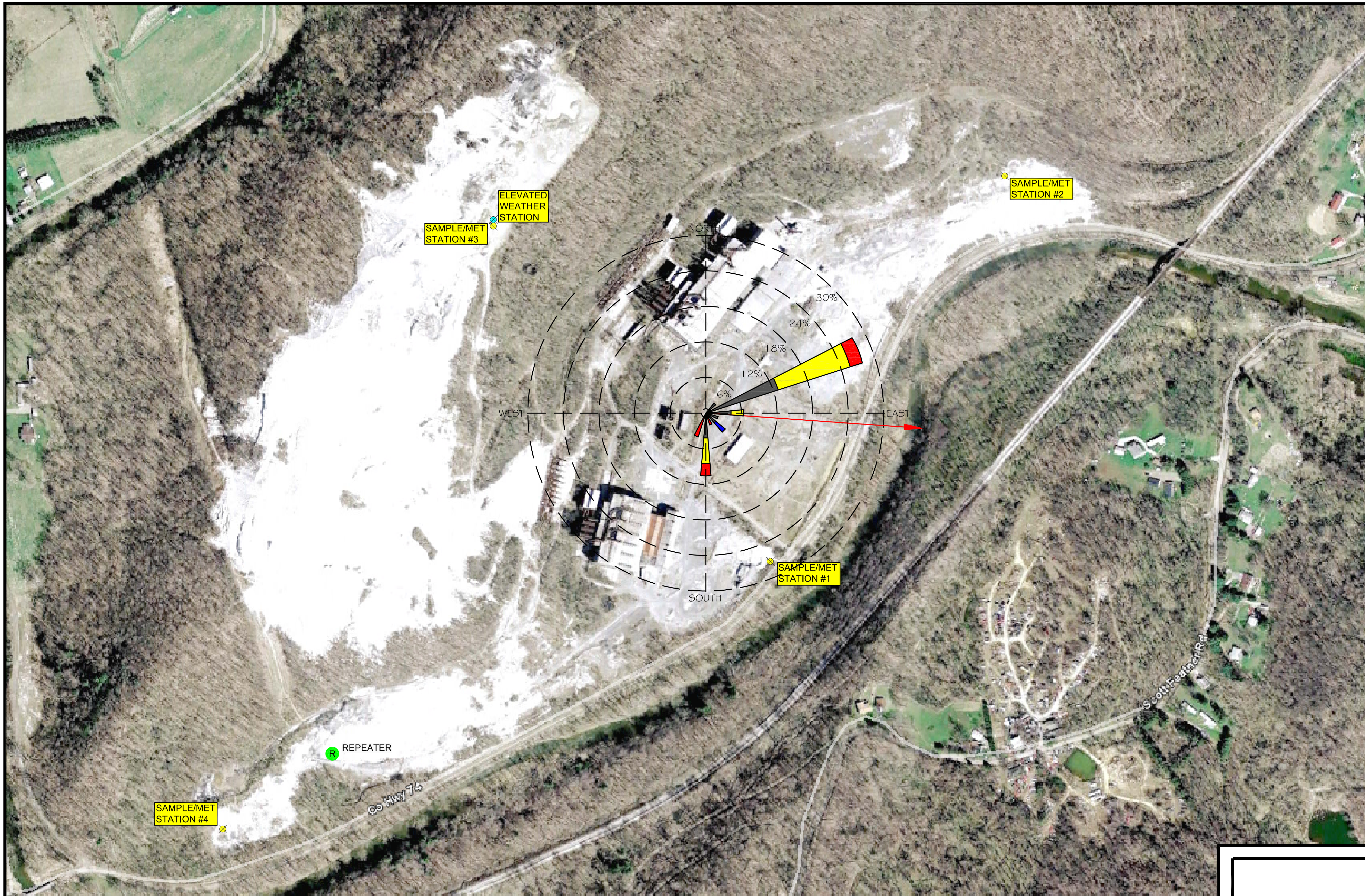
COUNTY ROAD 74 (GOULD ROAD)

CROSS CREEK TOWNSHIP, JEFFERSON COUNTY, OHIO

SCALE: NTS

AF041712

APRIL, 2012	CHECKED BY: SA	10-0312c	FIG 1



LEGEND

SITE WIDE WEATHER STATION

TENTATIVE SAMPLE/MET STATION

NOTE:
SAMPLE LOCATIONS WILL BE VERIFIED IN THE FIELD.

WIND SPEED (KNOTS)

- >=22
- 17-21
- 11-17
- 7-11
- 4-7
- 1-4

MEAN WIND DIRECTION DURING SAMPLING INTERVAL

METEOROLOGICAL DATA:

JULY 12, 2010
CALMS: 40.43%

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FIGURE 2

SAMPLING LOCATION MAP

SATRALLOY

COUNTY ROAD 74 (GOULD ROAD)

CROSS CREEK TOWNSHIP, JEFFERSON COUNTY, OHIO

SCALE: NTS

AF041912

APRIL, 2012	CHECKED BY: SA	10-0312c	FIG 2

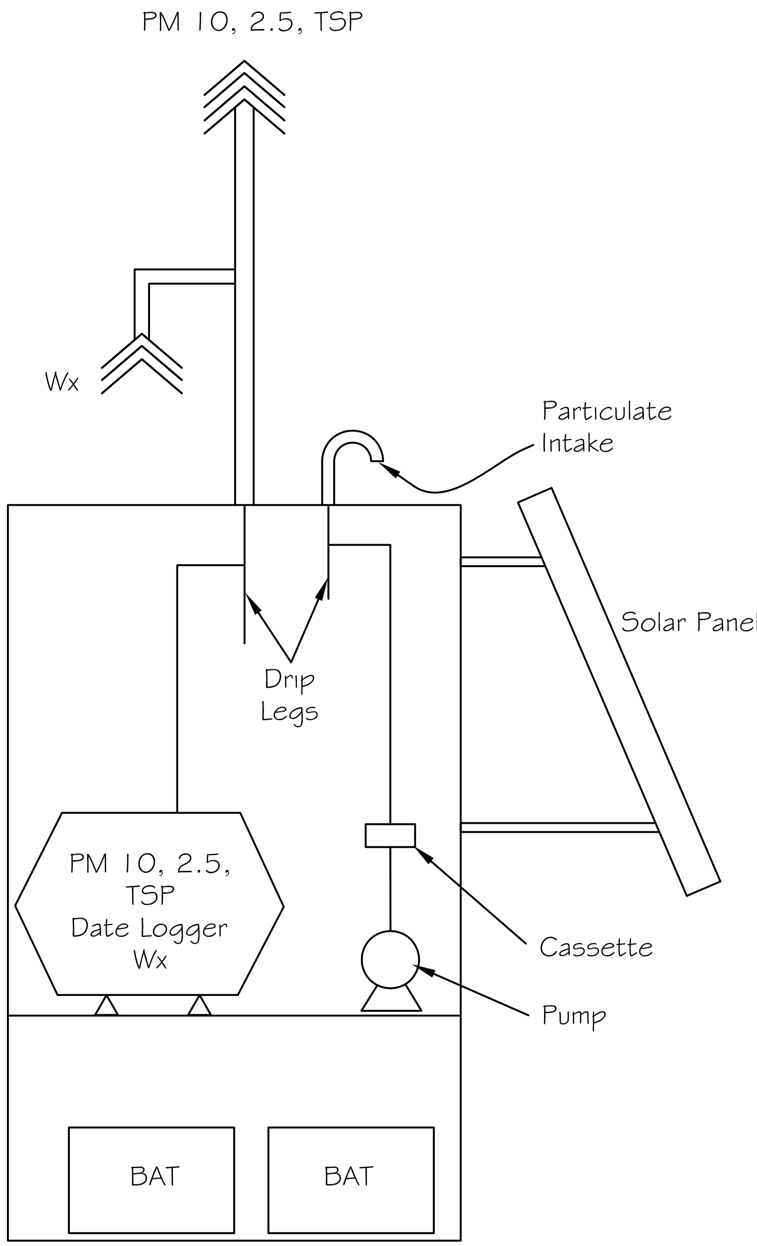

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FIGURE 3

SCHEMATIC ENVIRONMENTAL MONITORING UNIT

SATRALLOY

COUNTY ROAD 74 (GOULD ROAD)

CROSS CREEK TOWNSHIP, JEFFERSON COUNTY, OHIO

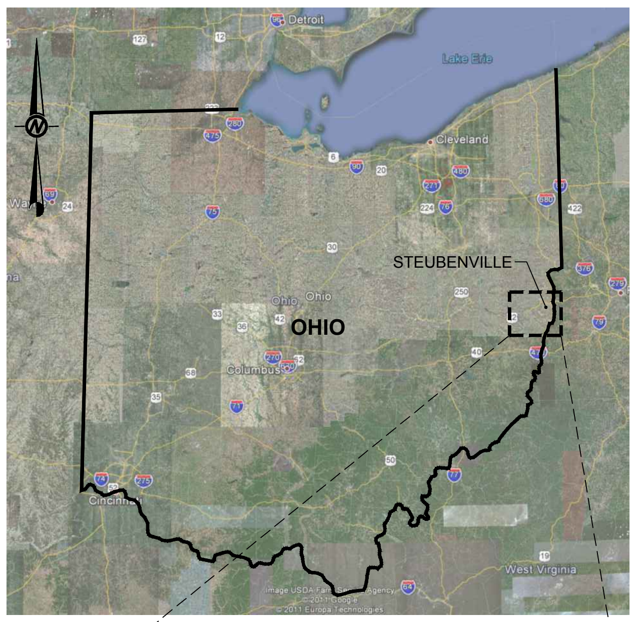
SCALE: NTS

AF041712

APRIL, 2012	CHECKED BY: SA	10-0312c	FIG 3

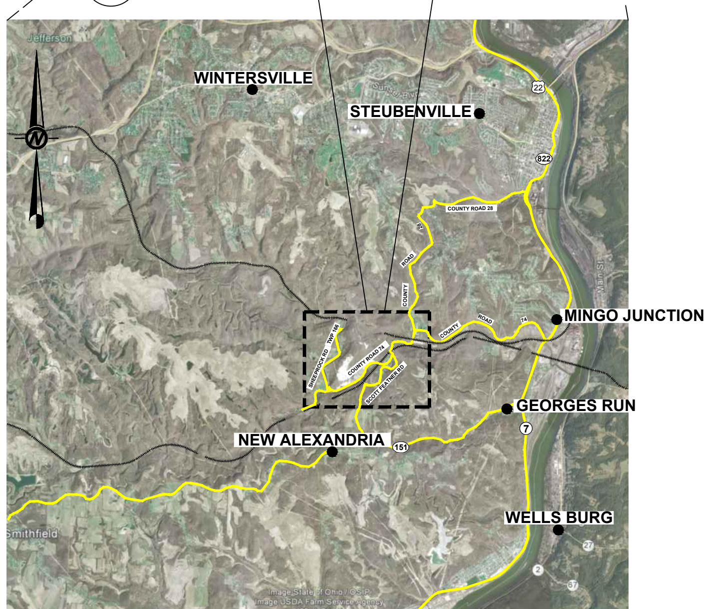
APPENDIX C
DRAWINGS
(provided separately)

CYPRUS AMAX MINERALS COMPANY
FORMER SATRALLOY SITE
JEFFERSON COUNTY, OHIO
NOVEMBER, 2012



LOCATION MAP
NOT TO SCALE

- / 110 SITE TOPOGRAPHY
PROJECT SITE



VICINITY MAP
NOT TO SCALE

DRAWING LIST - GOLDER ASSOCIATES	
SHEET NUMBER	TITLE
	INTERIM ACTION ABATEMENT & DEMOLITION
IAR-100	COVER SHEET
IAR-105	OVERALL SITE GENERAL ARRANGEMENT
IAR-110	SITE TOPOGRAPHY
IAR-210	ACTIVELY MANAGED AND BAGHOUSE DUST PILE LOCATIONS
IAR-230	FACILITIES LAYOUT PLANT AREA
IAR-240	DEMOLITION PLAN PLANT AREA
IAR-245	DEMOLITION PLAN NORTH SITE AREA AND SLURRY PIPELINE
IAR-250	FENCING PLAN AND MILL BUILDING BACKFILL PLAN
IAR-255	SOILS AND BAGHOUSE DUST STAGING AREA DETAILS
IAR-260	PERMANENT FENCING DETAILS
IAR-270	BIN BULKHEAD DEMOLITION DETAILS
IAR-275	MISCELLANEOUS DETAILS
IAR-280	SITE ENTRANCE ROAD DRAINAGE AND SURFACING PLAN - SHEET 1
IAR-282	SITE ENTRANCE ROAD DRAINAGE AND SURFACING PLAN - SHEET 2
IAR-285	SITE ENTRANCE ROAD DRAINAGE AND SURFACING DETAILS
	RAIL SPUR SUBGRADE
IAR-300	RAIL SPUR SUBGRADE GENERAL ARRANGEMENT
IAR-310	CLEARING AND GRUBBING PLAN
IAR-315	GRADING LIMITS
IAR-320	GEOMEMBRANE AND GEOTEXTILE PLACEMENT AREAS
IAR-325	GRAVEL SURFACING PLACEMENT AREAS FOR WORKER PROTECTION
	STORMWATER POLLUTION PREVENTION PLAN
IAS-500	STORMWATER POLLUTION PREVENTION PLAN GENERAL ARRANGEMENT
IAS-510	WORK AND DISTURBED AREAS PLANT AREA
IAS-515	WORK AND DISTURBED AREAS NORTH SITE AREA
IAS-520	STORMWATER FLOWS, CONTROLS, AND SAMPLING LOCATIONS PLANT AREA
IAS-525	STORMWATER FLOWS, CONTROLS, AND SAMPLING LOCATIONS NORTH SITE AREA
IAS-530	PRE-INTERIM ACTION STORMWATER FLOWS PLANT AREA
IAS-535	PRE-INTERIM ACTION STORMWATER FLOWS NORTH SITE AREA
IAS-540	EROSION AND SEDIMENT CONTROL DETAILS

DRAWING LIST - VANASSE HANGEN BRUSTILIN, INC. (VHB)	
NUMBER	DRAWING TITLE
	GRADING AND DRAINAGE PLANS
IAT-600	NOTES, ABBREVIATIONS AND LEGEND
IAT-602	KEY PLAN
IAT-604	EXISTING CONDITIONS PLAN SHEET 1 OF 3
IAT-606	EXISTING CONDITIONS PLAN SHEET 2 OF 3
IAT-608	EXISTING CONDITIONS PLAN SHEET 3 OF 3
IAT-610	FUTURE TRACK GEOMETRY & COORDINATES TABLE
IAT-612	TYPICAL SECTION 1 OF 2
IAT-614	TYPICAL SECTION 2 OF 2
IAT-616	DETAILS 1
IAT-618	GRADING AND DRAINAGE PLAN 1 OF 5
IAT-620	GRADING AND DRAINAGE PLAN 2 OF 5
IAT-622	GRADING AND DRAINAGE PLAN 3 OF 5
IAT-624	GRADING AND DRAINAGE PLAN 4 OF 5
IAT-626	GRADING AND DRAINAGE PLAN 5 OF 5
IAT-628	TRACK SUBGRADE PROFILE 1 OF 3
IAT-630	TRACK SUBGRADE PROFILE 2 OF 3
IAT-632	TRACK SUBGRADE PROFILE 3 OF 3
IAT-634	TRACK SUBGRADE CROSS SECTIONS 1 OF 4
IAT-636	TRACK SUBGRADE CROSS SECTIONS 2 OF 4
IAT-638	TRACK SUBGRADE CROSS SECTIONS 3 OF 4
IAT-640	TRACK SUBGRADE CROSS SECTIONS 4 OF 4
	RAIL SPUR PLANS
IAT-642	NOTES, ABBREVIATIONS, AND LEGEND
IAT-644	KEY PLAN
IAT-646	CONTRACTOR SITE ACCESS AND STAGING PLAN
IAT-648	TRACK GEOMETRY & COORDINATES TABLE
IAT-650	TYPICAL SECTIONS
IAT-652	DETAILS 1 OF 2
IAT-654	DETAILS 2 OF 2
IAT-656	TRACK PLAN & PROFILE 1 OF 3
IAT-658	TRACK PLAN & PROFILE 2 OF 3
IAT-660	TRACK PLAN & PROFILE 3 OF 3
IAT-662	TRACK CROSS SECTIONS 1 OF 4
IAT-664	TRACK CROSS SECTIONS 2 OF 4
IAT-666	TRACK CROSS SECTIONS 3 OF 4
IAT-668	TRACK CROSS SECTIONS 4 OF 4

NOTES:

1. DRAWING LIST - VANASSE HANGEN BRUSTILIN, INC. (VHB) FROM *VANASSE HANGEN BRUSTILIN, INC.* DATED NOVEMBER 2, 2012.

DRAFT
FOR FINAL REVIEW ONLY

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FAX (425) 882-5498

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

TITLE
COVER SHEET

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET
IAR-100

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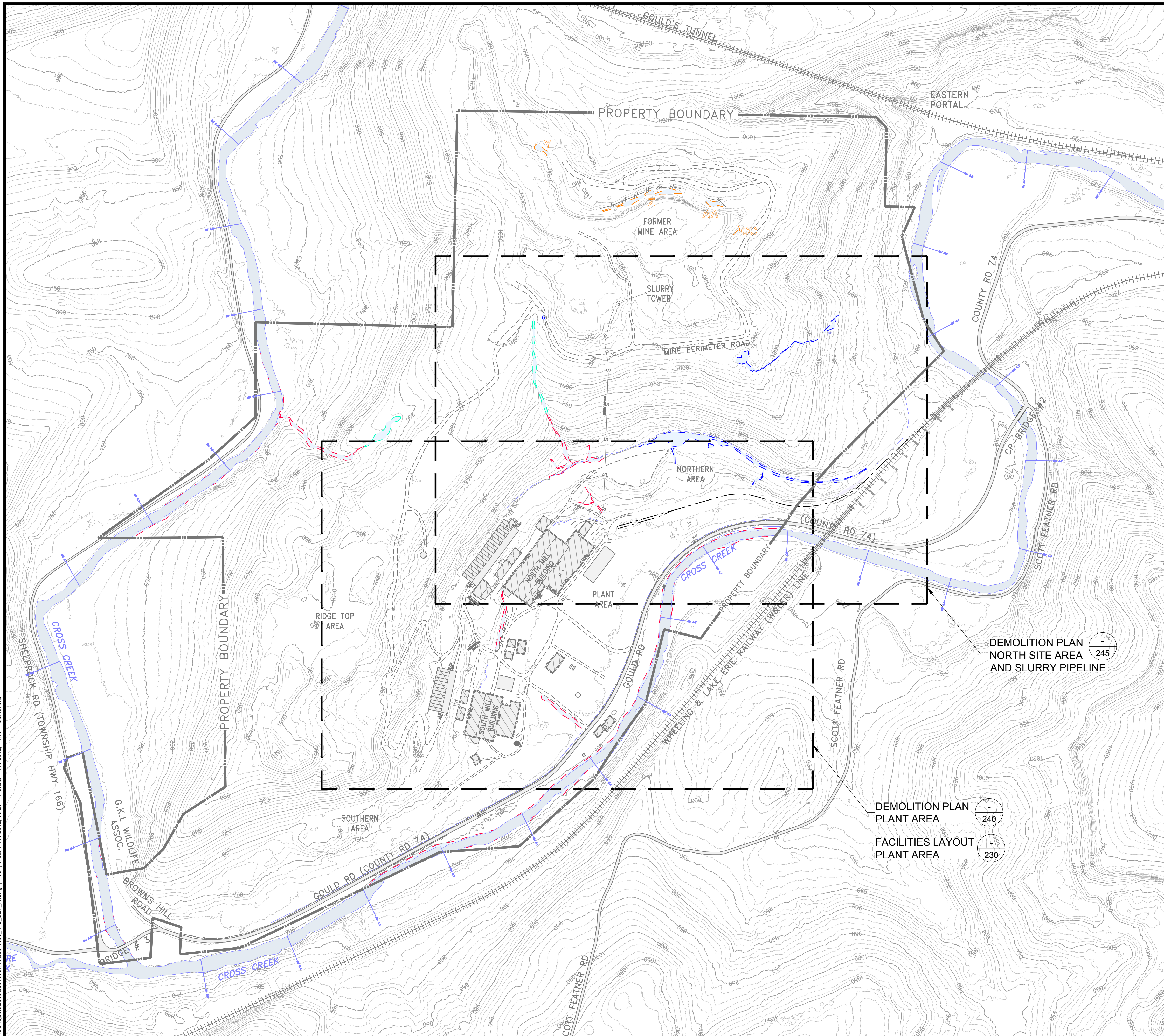

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NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE .
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. WETLANDS DELINEATION PROVIDED BY WESTLAND RESOURCES, INC., ON DRAWING DATED MAY 30, 2007.
4. THE RIVER MILE MARKERS SHOWN FOR CROSS CREEK HEREON WERE VIA A GEODATABASE AVAILABLE ON THE OHIO STATE DNR WEBSITE, JUNE 2012.
5. SITE ADDRESS:
   4243 COUNTY ROAD 74
   MINGO JUNCTION, OH 43938

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SLURRY PIPELINE
- CROSS CREEK
- EXISTING FACILITY (TO BE DEMOLISHED)
- FUTURE RAILROAD SPUR CENTERLINE (TO BE RECONSTRUCTED)

WETLAND LEGEND:
(SEE NOTE 3)

- INTERMITTENT JURISDICTIONAL WATERS OF US [CORPS]
- PERENNIAL JURISDICTIONAL WATERS OF US [CORPS]
- ISOLATED WETLANDS (OEPA JURISDICTION)
- OPEN WATER (NON-JURISDICTIONAL)

Golder Associates
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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION ABATEMENT & DEMOLITION

TITLE
OVERALL SITE GENERAL ARRANGEMENT

PROJECT No.	053-1695.410		
REV. 4	SCALE	AS SHOWN	
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

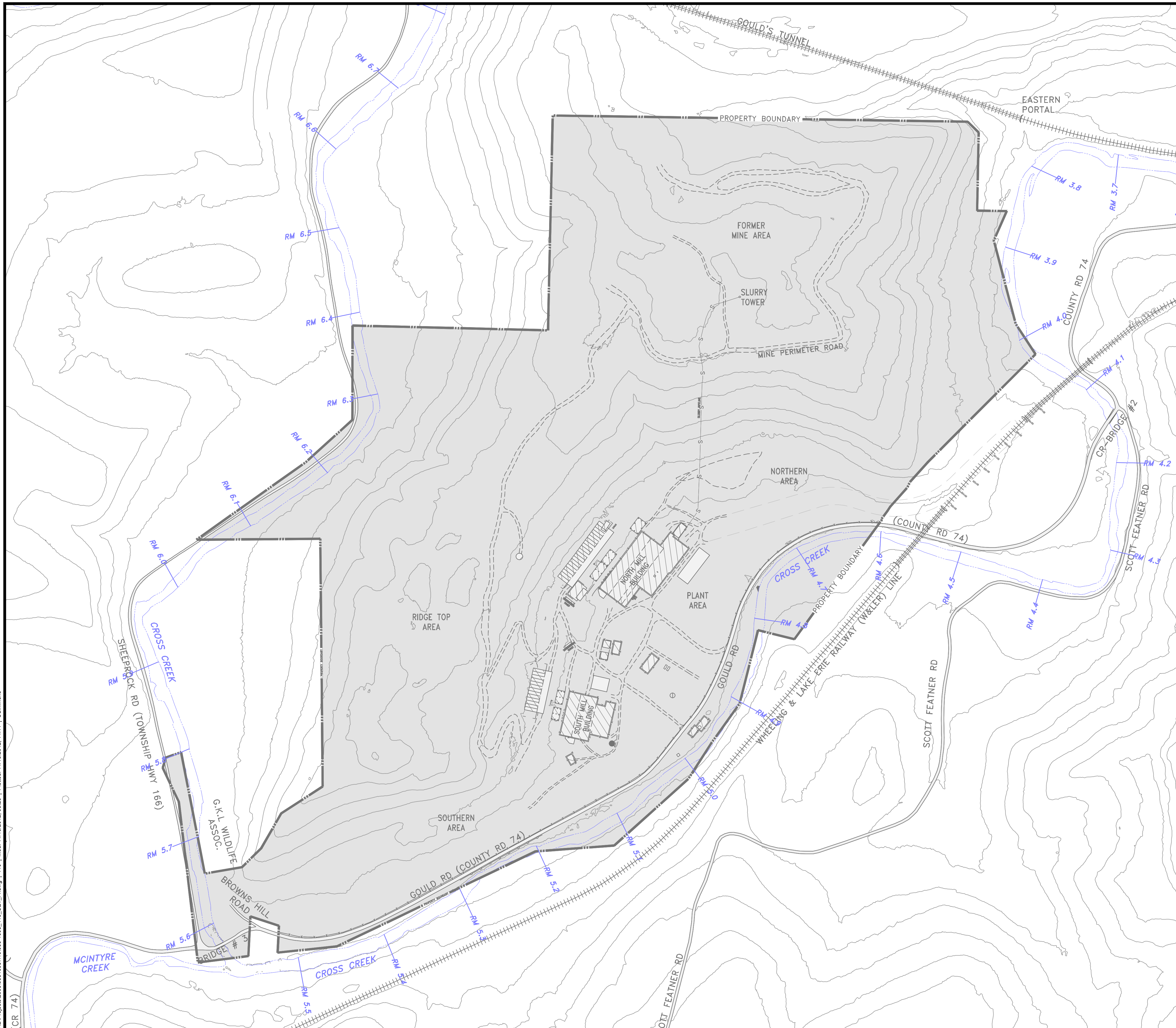
SHEET
IAR-105

NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE .
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT. ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. THE RIVER MILE MARKERS SHOWN FOR CROSS CREEK HEREON WERE VIA A GEODATABASE AVAILABLE ON THE OHIO STATE DNR WEBSITE, JUNE 2012.

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING PAVED ROAD
- EXISTING RAILROAD
- EXISTING SLURRY PIPELINE
- CROSS CREEK
- FORMER SATRALLOY SITE



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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	FSS	JDW	

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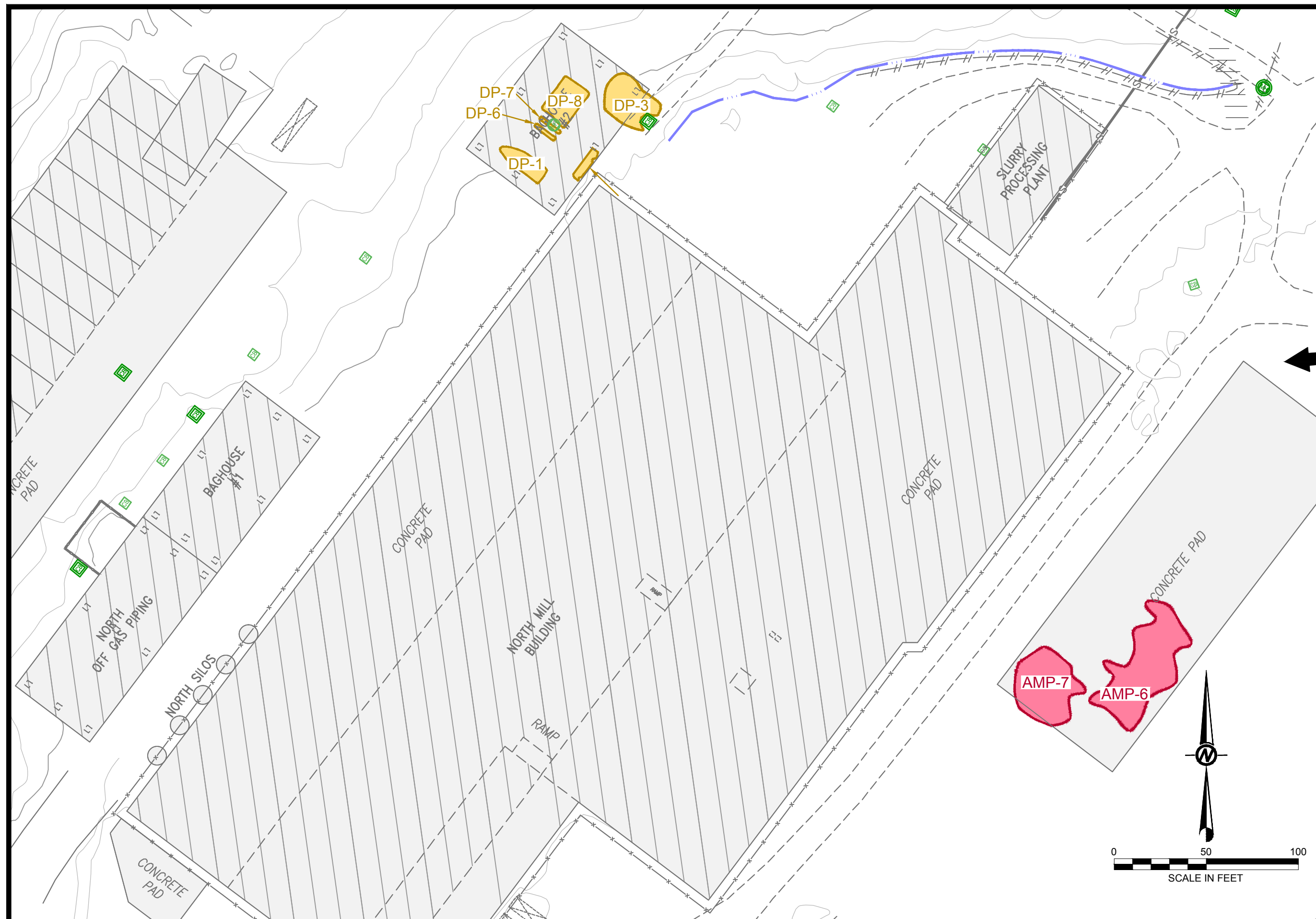
PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

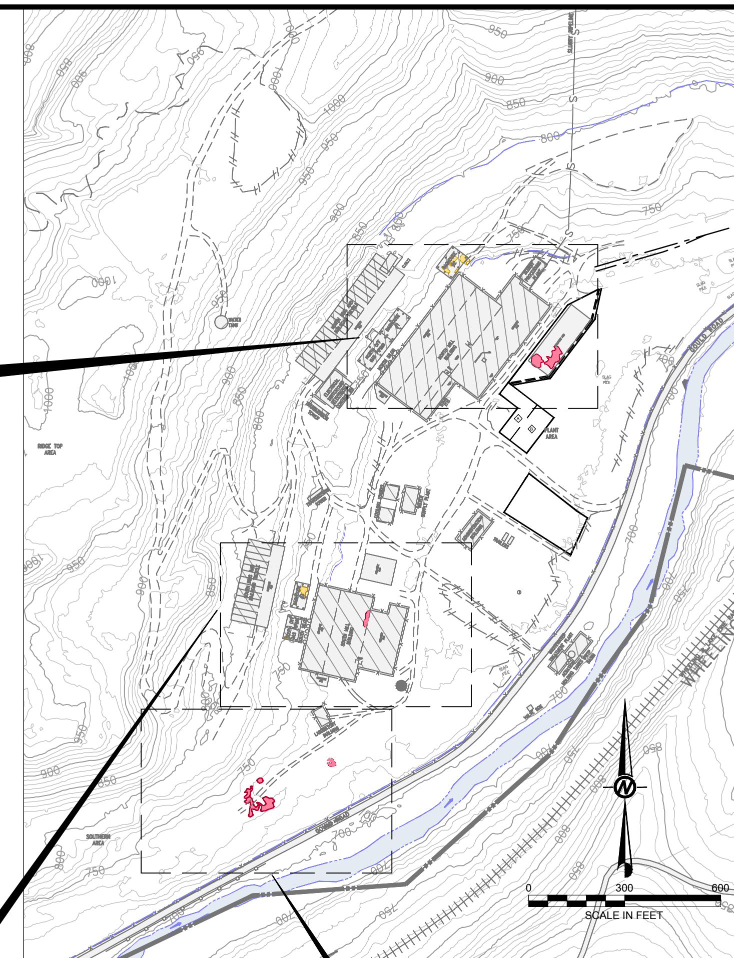
TITLE
SITE TOPOGRAPHY

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-110



NORTH MILL BUILDING AREA



NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE .
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
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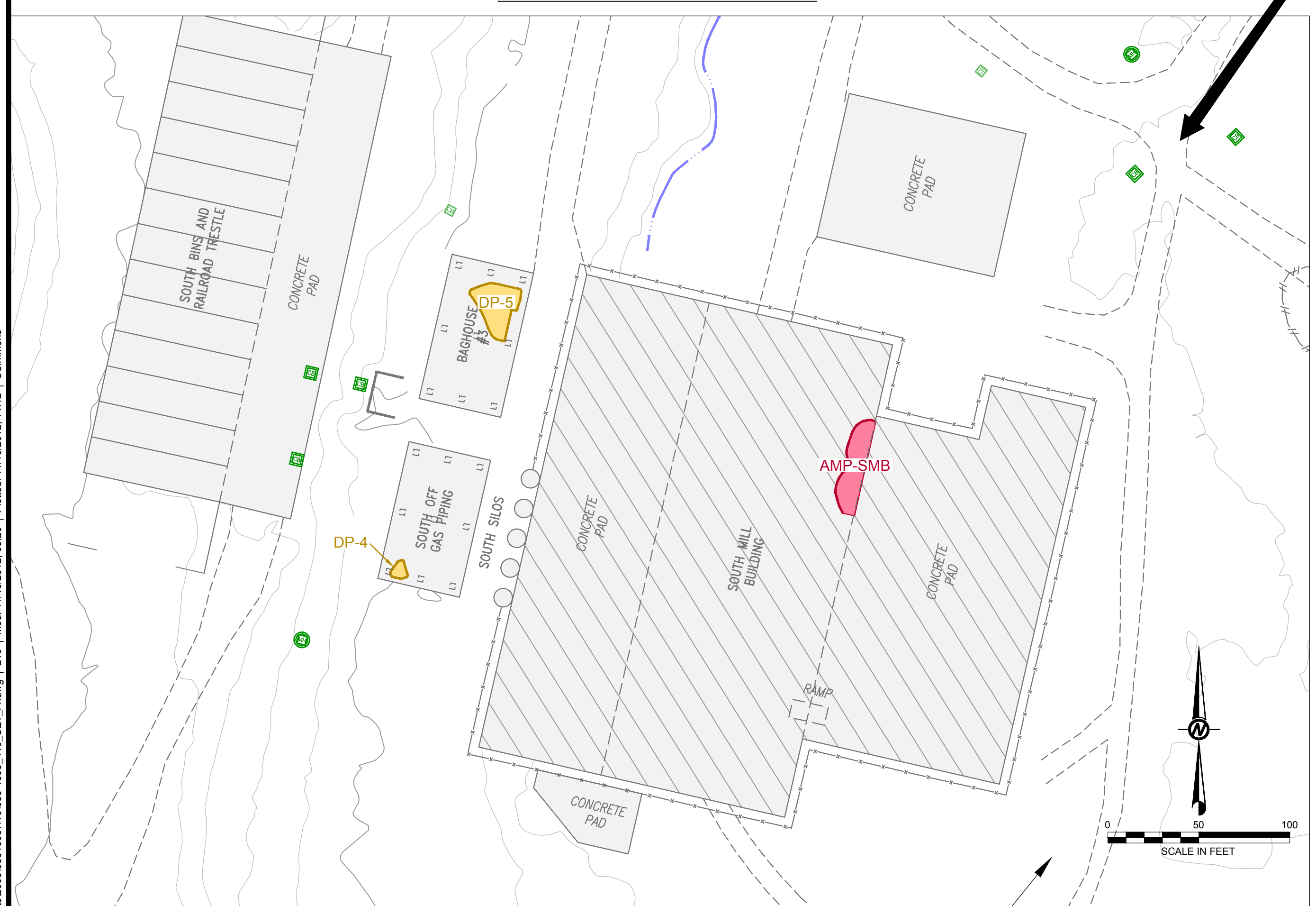
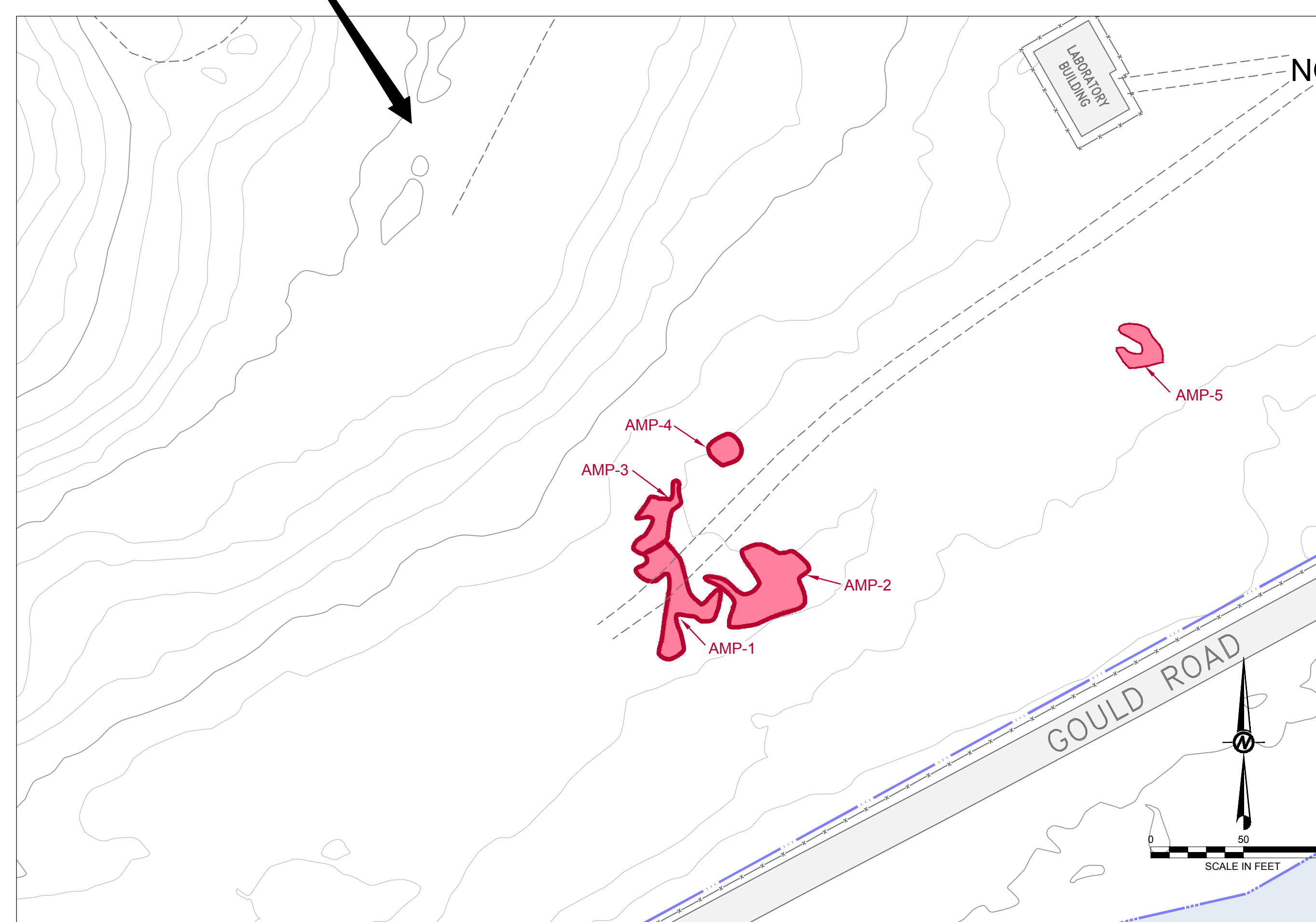
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. WETLANDS DELINEATION PROVIDED BY WESTLAND RESOURCES, INC., ON DRAWING DATED MAY 30, 2007.
4. SITE ADDRESS:
   4243 COUNTY ROAD 74
   MINGO JUNCTION, OH 43938

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SLURRY PIPELINE
- CROSS CREEK
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- FUTURE RAILROAD SPUR CENTERLINE (TO BE RECONSTRUCTED)
- ACTIVELY MANAGED PILE
- BAGHOUSE DUST PILE



SOUTH MILL BUILDING AREA



LABORATORY BUILDING AREA

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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

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PROJECT

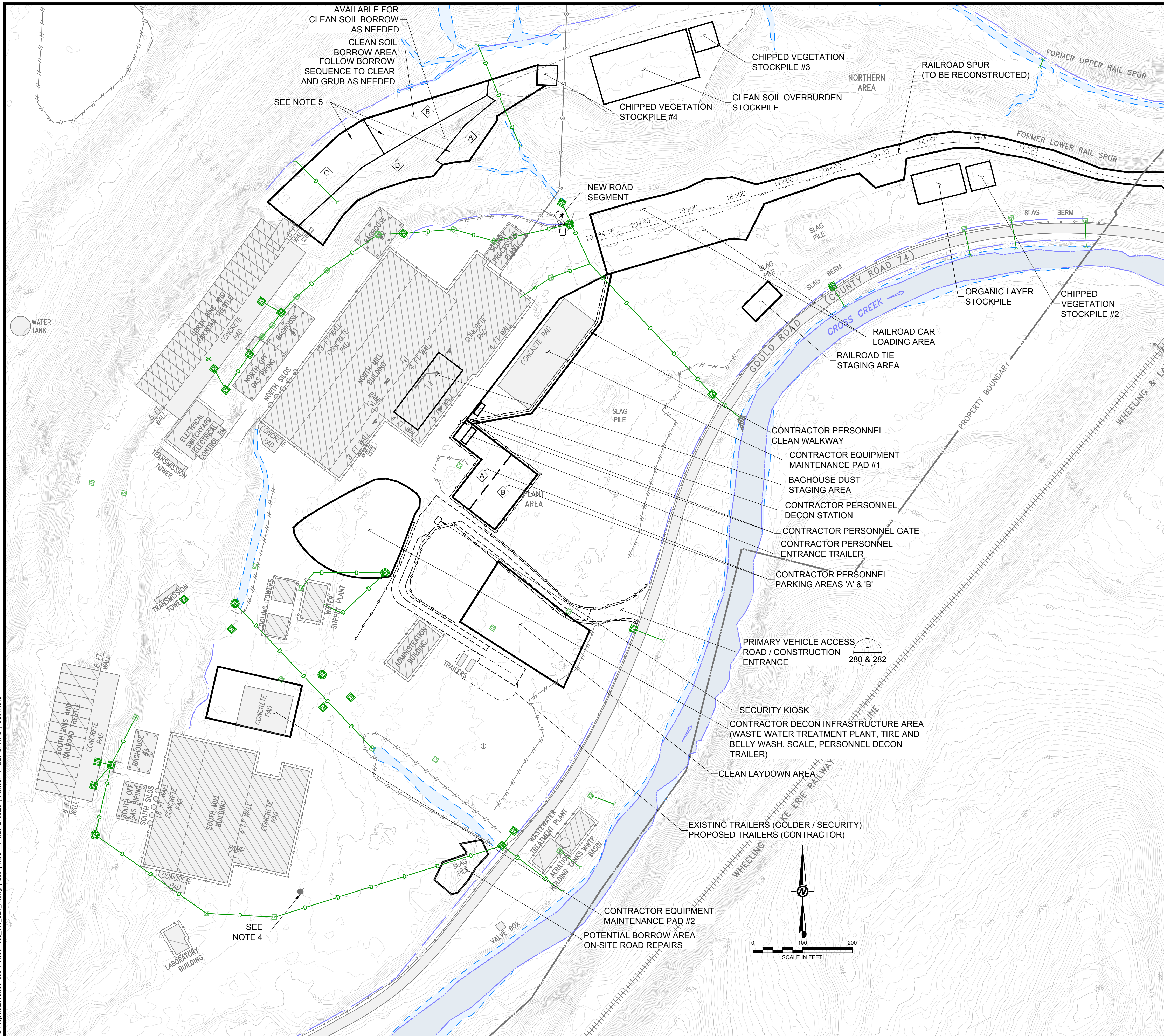
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

TITLE

ACTIVELY MANAGED AND BAGHOUSE DUST PILE LOCATIONS

PROJECT No.	053-1695.410	
REV. 4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12
CADD	SES	11-12-12
CHECK	JDW	11-12-12
REVIEW		

SHEET
IAR-210



NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. CONTRACTOR FACILITIES LOCATION AND LAYOUT MAY BE ADJUSTED TO ACCOMMODATE PROPOSED OPERATIONS, SUBJECT TO PRIOR WRITTEN APPROVAL BY THE CONSTRUCTION MANAGER.
4. HYDRANTS ARE OUT OF SERVICE. REMOVE HYDRANTS, DROP VALVES, AND ABOVE-GRADE PORTION OF PIPING. CAP AND LEAVE UNDERGROUND PIPING IN PLACE.
5. DEVELOP AREAS A, B, AND C, SEQUENTIALLY, AS-NEEDED. DEVELOP AREA D ONLY IF REQUIRED AND APPROVED BY THE CONSTRUCTION MANAGER.

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- EXISTING FENCE (TO BE REMOVED)
- FENCE (TEMPORARY)
- EXISTING SLURRY PIPELINE
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT (SEE NOTE 4)
- EXISTING GROUNDWATER WELL
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)

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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

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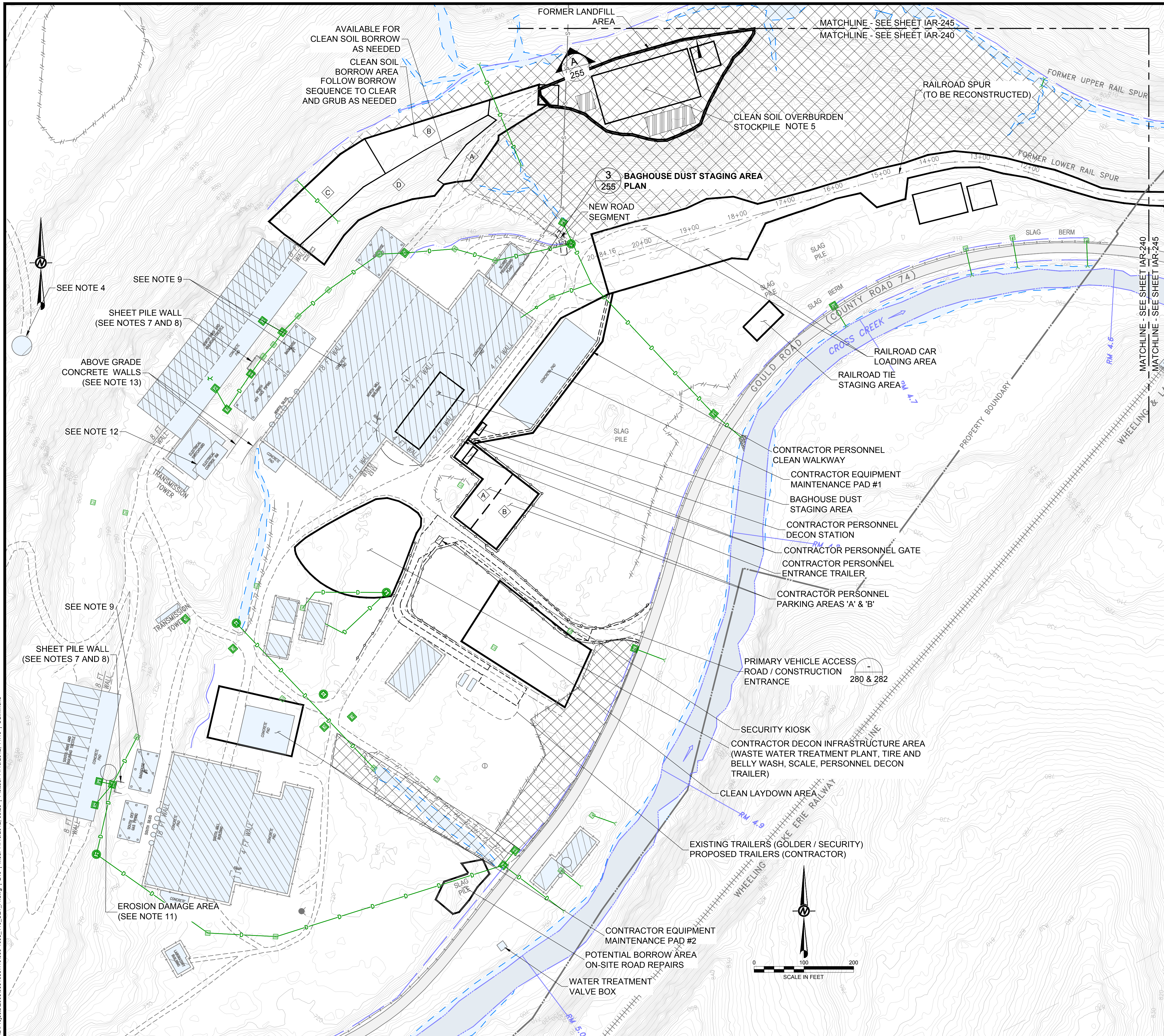
PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION ABATEMENT & DEMOLITION

TITLE
FACILITIES LAYOUT PLANT AREA

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-230



NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PRIOR TO BEGINNING ANY DEMOLITION ACTIVITIES, VERIFY THAT SILT FENCE IS PRESENT AROUND WETLAND AREAS AS SHOWN AND IS UNDAMAGED AND FUNCTIONAL. REPAIR AS NEEDED. INSTALL ADDITIONAL BMPS PER SPECIFICATIONS AND AS SHOWN ON SWPPP SHEETS IAS-520 AND IAS-525.
3. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
4. DEMOLISH WATER TANK AND ABOVE-GROUND PORTIONS OF PIPING, VALVES, AND ASSOCIATED EQUIPMENT. SALVAGE WOOD PLANKS FORMING TANK AND STOCKPILE AT LOCATION AS DIRECTED BY THE CONSTRUCTION MANAGER. REMOVE CONCRETE FOUNDATION TO EXISTING GRADE.
5. DETAIL ON SIZING, SLOPING AND STABILIZATION IS SHOWN ON IAR-255.
6. ALL GROUNDWATER WELLS MAY NOT BE SHOWN ON DRAWINGS. CHECK WITH CONSTRUCTION MANAGER PRIOR TO WORK IN AREA.
7. ALL BACKFILL AREA SLOPES ARE TO BE 2:1 UNLESS SLOPING INTO HILLSIDES WILL NOT ALLOW.
8. CUT OFF SHEET PILES EVEN WITH GRADE. DO NOT REMOVE BELOW-GRADE PORTION OF SHEET PILES.
9. COLLECT BAGHOUSE DUST AND PLACE IN STAGING AREA (SEE SHEETS IAR-210 AND IAR-255).
10. REMOVE ABOVE-GRADE PORTION OF STORMWATER MANHOLE. CAP WITH PRECAST MANHOLE RING AND CAST IRON COVER BOLTED TO REMAINING PORTION OF MANHOLE.
11. BACKFILL EROSION DAMAGE AREA TO PROVIDE SUPPORT FOR AND TO RE-BURY EXPOSED CATCH BASIN AND DRAINAGE PIPE. USE CRUSHED CONCRETE FOR BACKFILL. PLACE AND COMPACT IN LIFTS AS DESCRIBED IN THE SPECIFICATIONS. FINAL SURFACE SHALL BE EVEN WITH ADJACENT GRADE.
12. DEMOLISH ONLY THAT PORTION OF STRUCTURE ABOVE FIRST FLOOR SLAB. DO NOT DEMOLISH BASEMENT WALLS OR FIRST FLOOR SLAB. ALONG SOUTHEASTERN EDGE OF BUILDING, RETAIN APPROXIMATELY 4 TO 5 FEET HIGH PORTION OF BLOCK WALL TO PROVIDE FALL PROTECTION. TOP OF RETAINED BLOCK WALL SEGMENT, INSTALL 6 FEET HIGH CHAIN LINK FENCE PER SPECIFICATIONS AND AS SHOWN ON SHEETS IAR-250 AND IAR-275. SEAL BASEMENT STAIRWELL WITH $\frac{1}{2}$ INCH GALVANIZED STEEL PLATE BOLTED TO FLOOR. SEAL BASEMENT ENTRY DOOR WITH MINIMUM $\frac{1}{4}$ INCH GALVANIZED STEEL PLATE BOLTED TO OUTSIDE WALL OR USING OTHER APPROVED METHOD.
13. DEMOLISH TO GRADE.
14. REFER TO SPECIFICATIONS 01000 AND 02150 OF THE PROJECT MANUAL.

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED) (SEE NOTE 5)
- EXISTING FENCE (TO BE REMOVED)
- EXISTING SHEET PILE WALL (SEE NOTES 7 AND 8)
- EXISTING SLURRY PIPELINE
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING GROUNDWATER WELL (SEE NOTE 6)
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- FENCE (TEMPORARY)
- FENCE (PERMANENT)
- DEBRIS REMOVAL AREA (SEE NOTE 14)
- DEBRIS STAGING AREA

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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
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1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

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PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION ABATEMENT & DEMOLITION

TITLE
DEMOLITION PLAN PLANT AREA

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET
IAR-240

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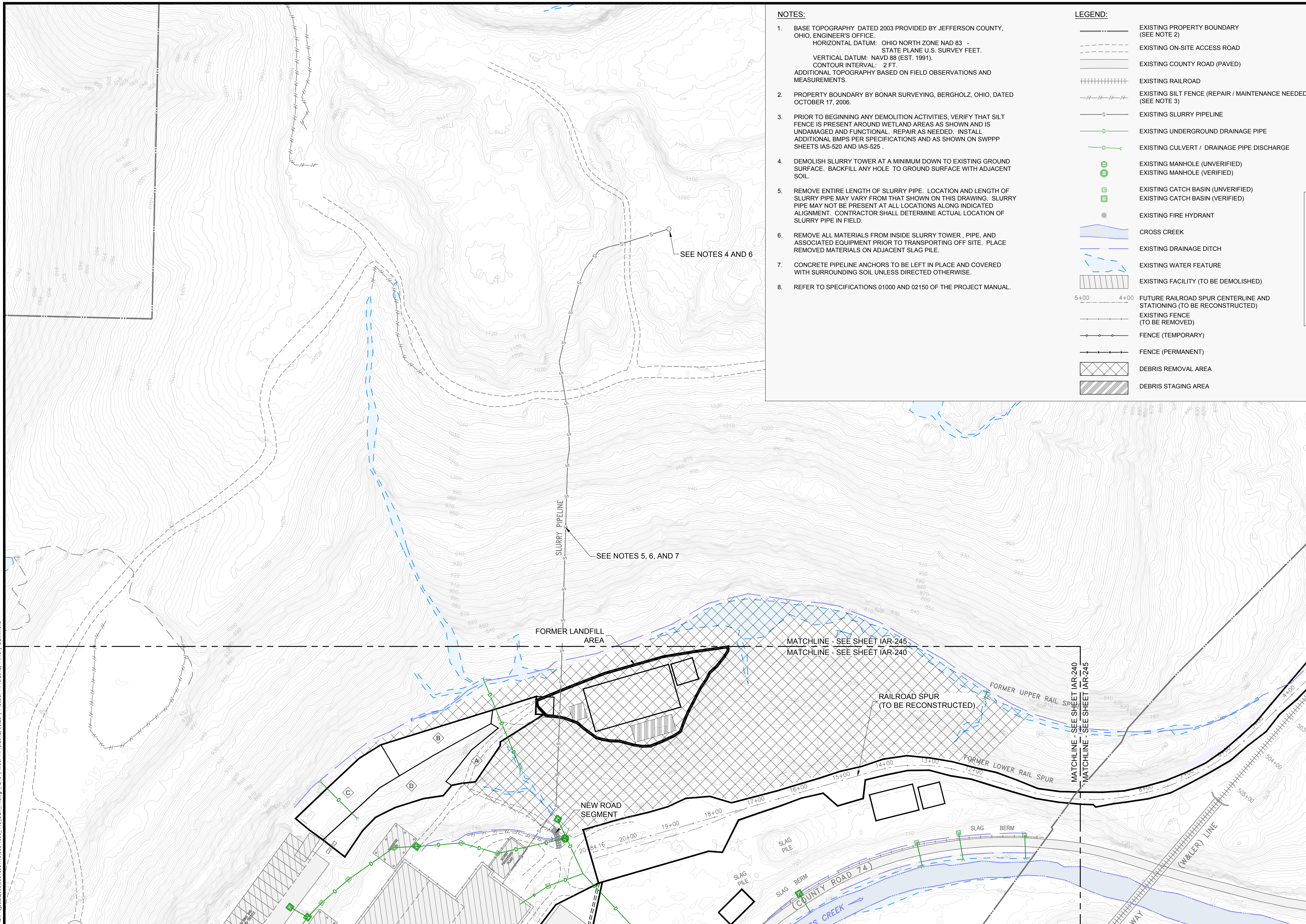

NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. PRIOR TO BEGINNING ANY DEMOLITION ACTIVITIES, VERIFY THAT SILT FENCE IS PRESENT AROUND WETLAND AREAS AS SHOWN AND IS UNDAMAGED AND FUNCTIONAL. REPAIR AS NEEDED. INSTALL ADDITIONAL BMPS PER SPECIFICATIONS AND AS SHOWN ON SWPPP SHEETS IAS-520 AND IAS-525 .
4. DEMOLISH SLURRY TOWER AT A MINIMUM DOWN TO EXISTING GROUND SURFACE. BACKFILL ANY HOLE TO GROUND SURFACE WITH ADJACENT SOIL.
5. REMOVE ENTIRE LENGTH OF SLURRY PIPE. LOCATION AND LENGTH OF SLURRY PIPE MAY VARY FROM THAT SHOWN ON THIS DRAWING. SLURRY PIPE MAY NOT BE PRESENT AT ALL LOCATIONS ALONG INDICATED ALIGNMENT. CONTRACTOR SHALL DETERMINE ACTUAL LOCATION OF SLURRY PIPE IN FIELD.
6. REMOVE ALL MATERIALS FROM INSIDE SLURRY TOWER , PIPE, AND ASSOCIATED EQUIPMENT PRIOR TO TRANSPORTING OFF SITE. PLACE REMOVED MATERIALS ON ADJACENT SLAG PILE.
7. CONCRETE PIPELINE ANCHORS TO BE LEFT IN PLACE AND COVERED WITH SURROUNDING SOIL UNLESS DIRECTED OTHERWISE.
8. REFER TO SPECIFICATIONS 01000 AND 02150 OF THE PROJECT MANUAL.

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED) (SEE NOTE 3)
- EXISTING SLURRY PIPELINE
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- EXISTING FENCE (TO BE REMOVED)
- FENCE (TEMPORARY)
- FENCE (PERMANENT)
- DEBRIS REMOVAL AREA
- DEBRIS STAGING AREA

GOLDER ASSOCIATES INC.
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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
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0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT

FORMER SATRALLOY SITE
INTERIM ACTION ABATEMENT & DEMOLITION

TITLE

DEMOLITION PLAN NORTH SITE AREA AND SLURRY PIPELINE

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET
IAR-245

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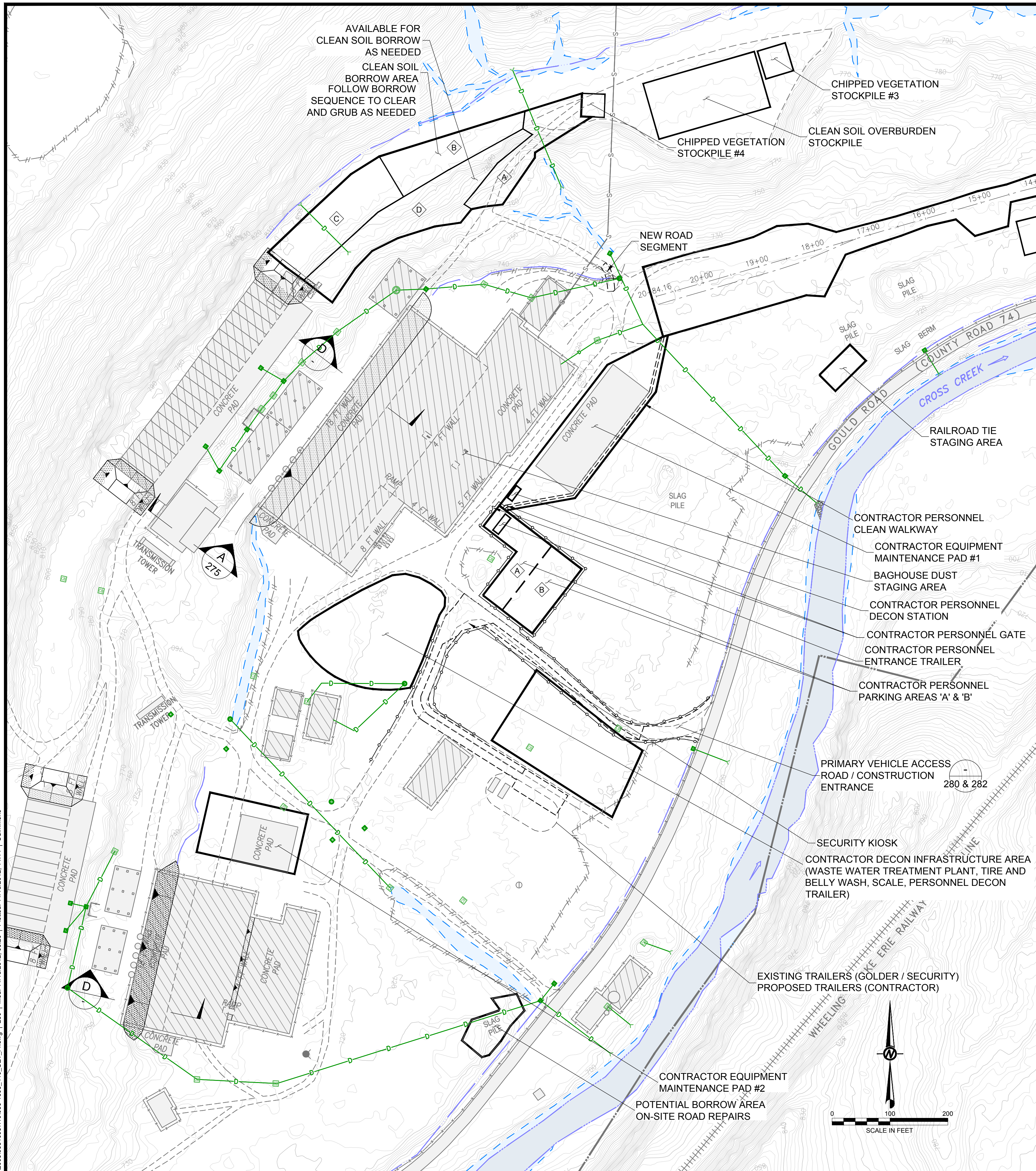

NOTES:

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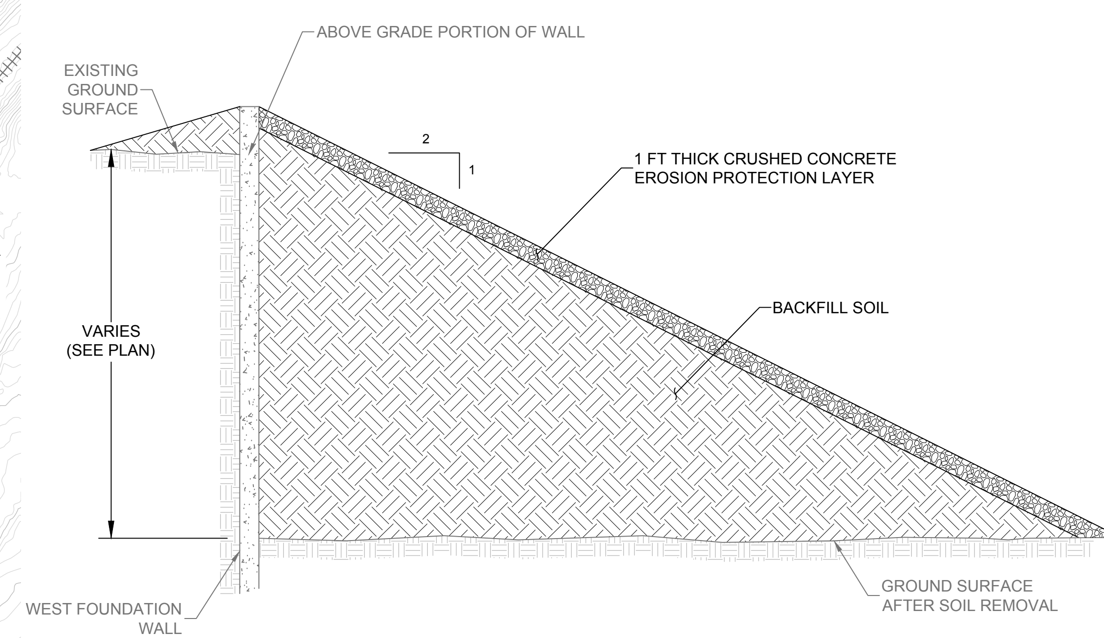
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. FENCING SHALL CONFORM TO THE DETAILS SHOWN ON SHEET IAR-260, EXCEPT AS NOTED.
4. ALL BACKFILL AREA SLOPES SHALL BE 2:1 UNLESS SLOPING INTO HILLSIDES WILL NOT ALLOW.

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SHEET PILE WALL
- EXISTING SLURRY PIPELINE
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING GROUNDWATER WELL
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- EXISTING FENCE TO BE REMOVED
- EXISTING SILT FENCE
- FENCE (TEMPORARY) ADDED BY CONTRACTOR (TO BE REMOVED UPON COMPLETION OF WORK)
- FENCE (PERMANENT) (SEE NOTES 3 AND 4)
- BACKFILL AREA
- 2:1 SLOPE SYMBOL



D
-

BACKFILL CROSS SECTION MILL BUILDINGS

NOT TO SCALE

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4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

TITLE
FENCING PLAN & MILL BUILDING BACKFILL PLAN

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-250

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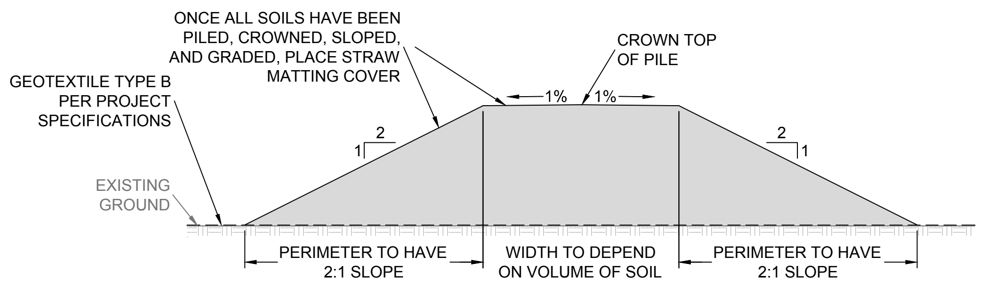
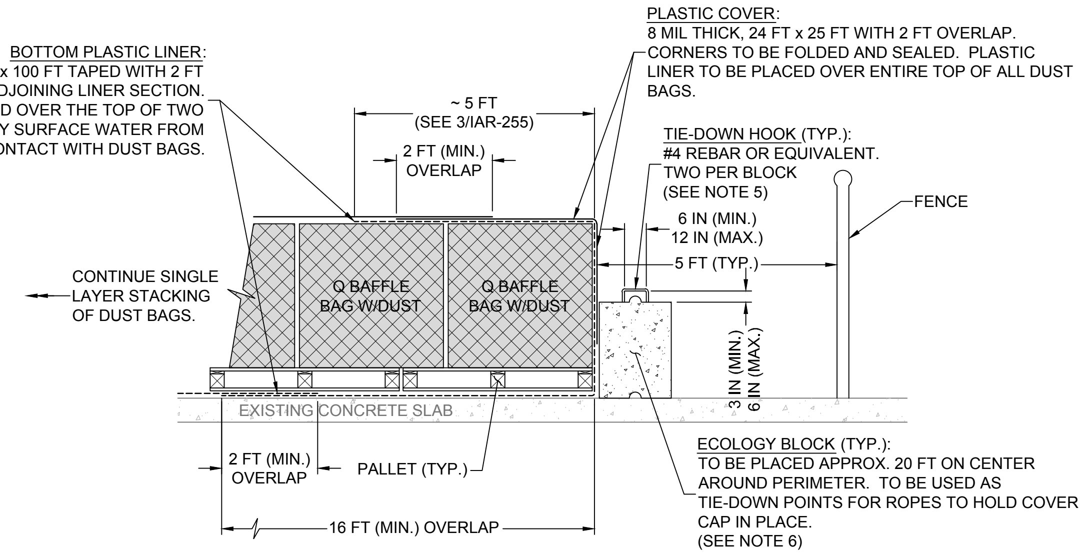


CLEAN SOIL OVERBURDEN STOCKPILE ELEVATION

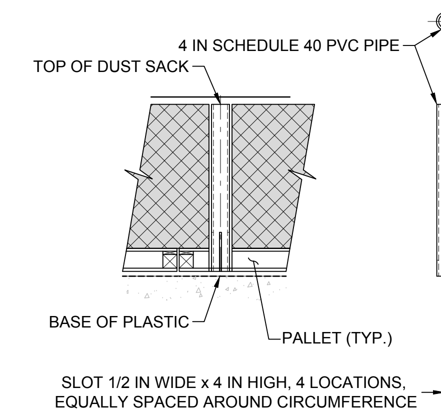
A
240, 525

0 10 20
SCALE IN FEET



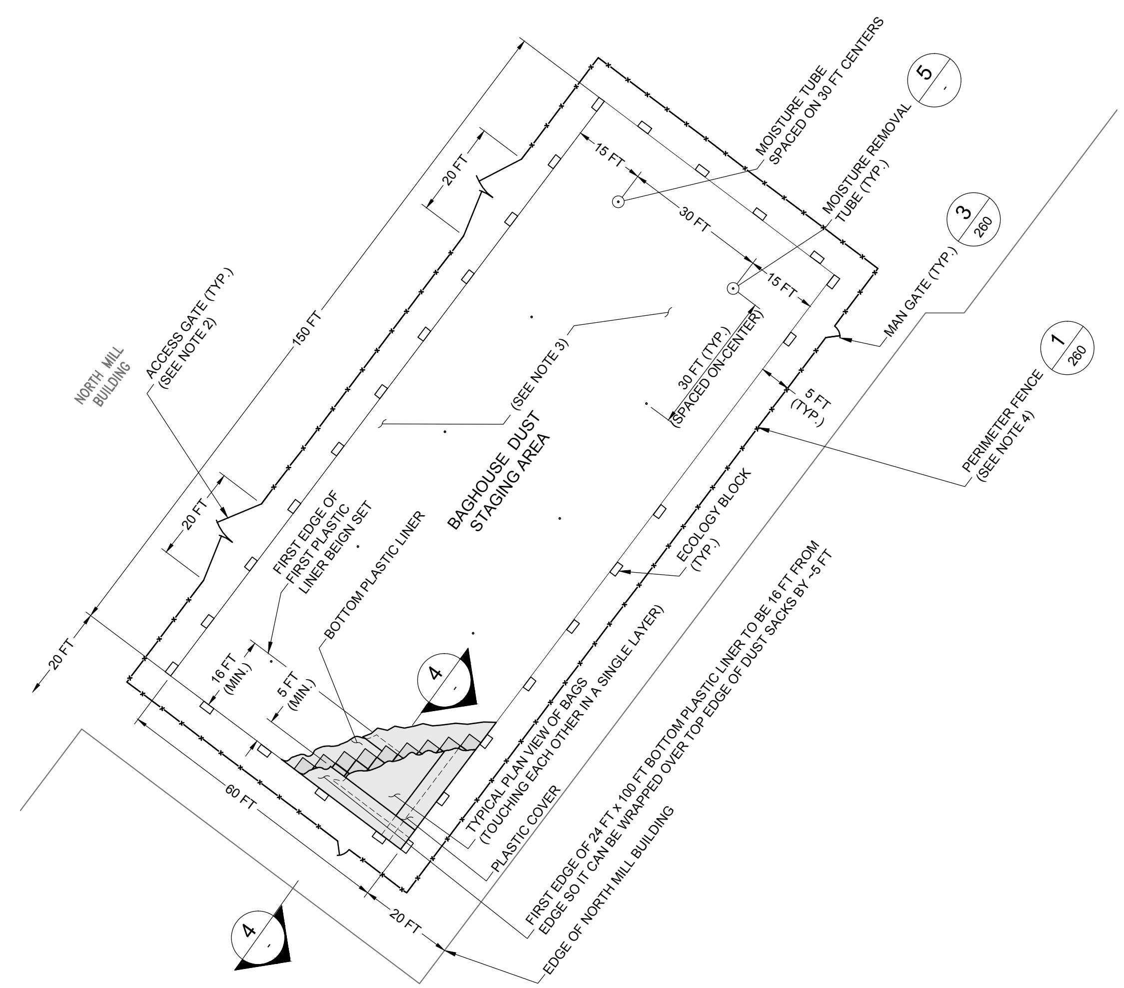
BAGHOUSE DUST STAGING AREA ELEVATION

4
-
NOT TO SCALE



MOISTURE REMOVAL TUBES TYPICAL DETAIL

5
-
NOT TO SCALE



BAGHOUSE DUST STAGING AREA PLAN

3
240, 350

0 20 40
SCALE IN FEET

NOTES:

1. DIMENSIONS AND LOCATION OF BAGHOUSE DUST STAGING AREA SHALL BE MODIFIED AS NECESSARY IN THE FIELD TO ACCOMMODATE ACTUAL QUANTITIES OF STAGED MATERIAL. REVISED DIMENSIONS TO BE APPROVED BY THE CONSTRUCTION MANAGER.
2. LOCATE ACCESS GATE AS CONVENIENT, SUBJECT TO APPROVAL OF CONSTRUCTION MANAGER. ADDITIONAL ACCESS GATES MAY BE INSTALLED AS REQUIRED AND APPROVED.
3. REMOVE ALL FOUNDATIONS, PEDESTALS, ANCHOR BOLTS, AND OTHER PROTRUSIONS TO PROVIDE A SMOOTH, FLAT SURFACE, EVEN WITH ADJACENT CONCRETE PAD. FILL ALL VOIDS AND OPENINGS WITH SPECIFIED MATERIAL TO PROVIDE A SMOOTH, FLAT SURFACE, EVEN WITH ADJACENT CONCRETE PAD. FINISHED SURFACES SHALL NOT DAMAGE PLASTIC LINER AND SHALL BE APPROVED BY THE CONSTRUCTION MANAGER PRIOR TO LINER PLACEMENT.
4. CONSTRUCT FENCE AFTER ALL DUST BAGS HAVE BEEN SET IN PLACE AND PLASTIC COVER SEAMS HAVE BEEN SEALED.
5. TIE-DOWN HOOKS SHALL BE IN ADDITION TO ECOLOGY BLOCK MANUFACTURER'S STANDARD LIFTING POINTS. USE 1/2 INCH DIA. NYLON ROPE TO CROSS OVER IN "X" PATTERN TO HELP HOLD DOWN PLASTIC AGAINST WIND.
6. ECOLOGY BLOCK TO BE REINFORCED CONCRETE, 3,000 PSI (MIN.). HEIGHT TO BE 2 FEET (MIN.) TO 3 FEET (MAX.). WIDTH TO BE 18 INCHES (MIN.) TO 30 INCHES (MAX.). LENGTH 3 FEET (MIN.), 6 FEET (MAX.).

LEGEND:

FENCE (PERMANENT)
BOTTOM PLASTIC LINER
TOP PLASTIC COVER
GEOTEXTILE

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0	12-30-11	FSS	SITE MEETING	NED	JDW	

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PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

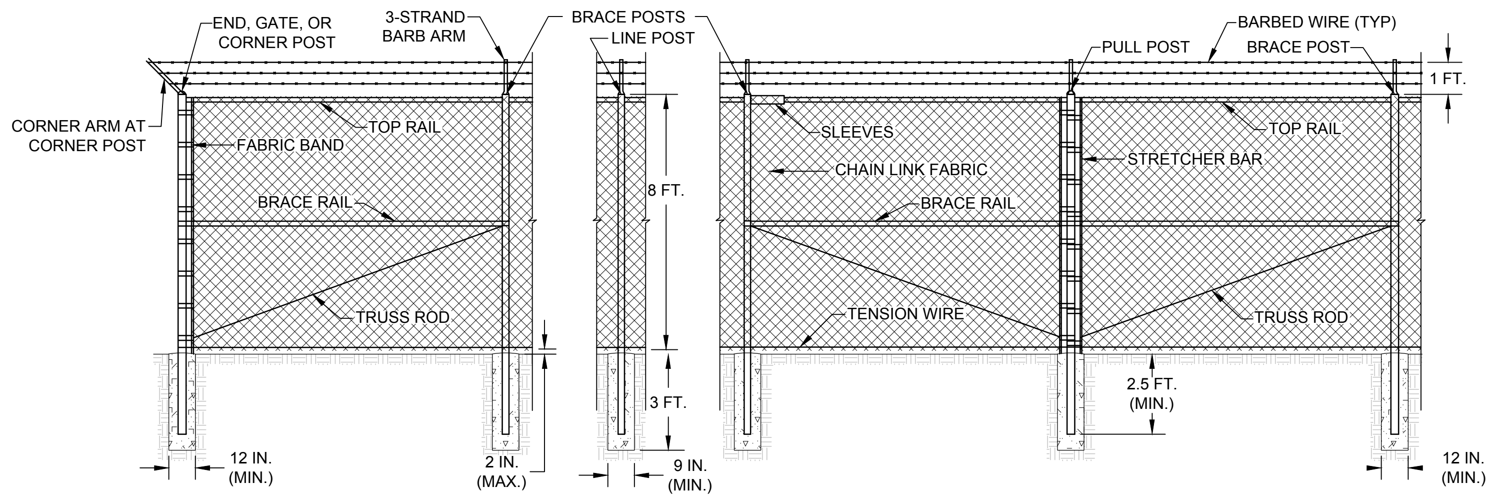
TITLE
SOILS AND BAGHOUSE
DUST STAGING AREA
DETAILS

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-255

NOTES - PERIMETER FENCE AND GATES:

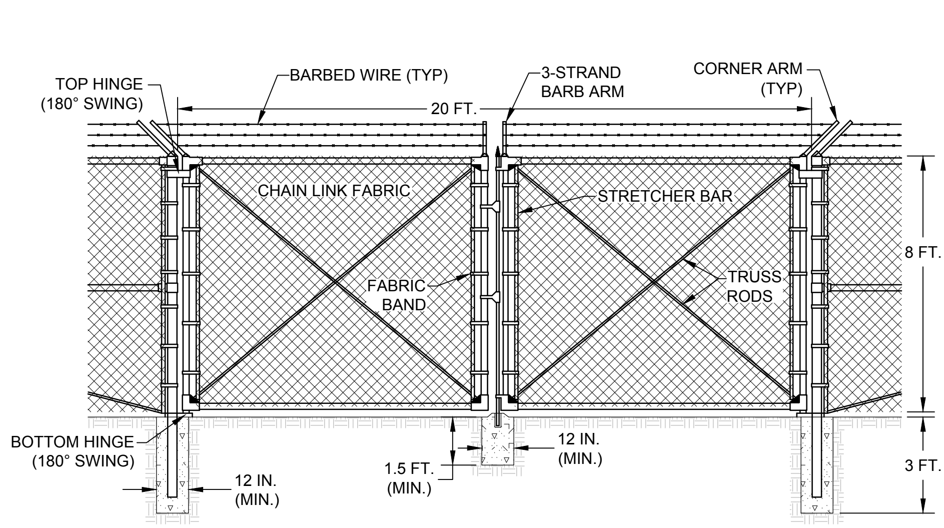
1. DETAILS SHOWN ON THIS SHEET APPLY ONLY TO PERMANENTLY-INSTALLED FENCING THAT WILL REMAIN IN PLACE AT THE COMPLETION OF ABATEMENT AND DEMOLITION ACTIVITIES.
2. DETAILS ARE ILLUSTRATIVE AND SHALL NOT LIMIT HARDWARE DESIGN OR SELECTION.
3. ACCESS GATE LOCATIONS MAY BE MODIFIED TO SUIT CONTRACTOR'S OPERATIONS WITH PRIOR WRITTEN APPROVAL BY THE CONSTRUCTION MANAGER .



1 -

PERIMETER FENCE TYPICAL DETAIL

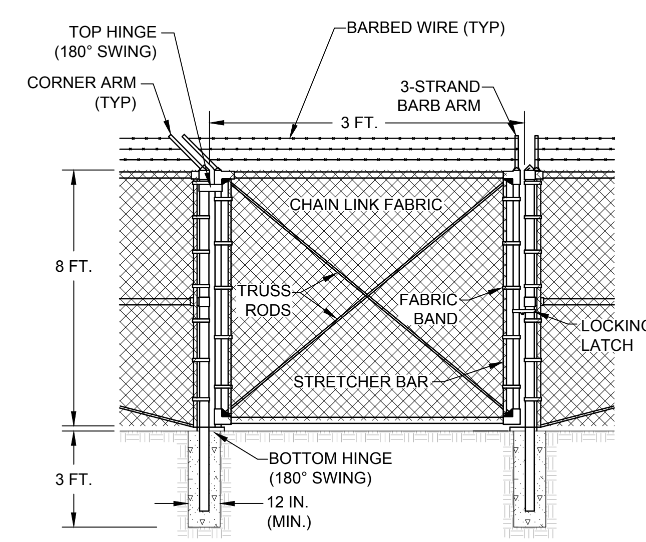
SCALE IN FEET



2 -

ACCESS GATE TYPICAL DETAIL

NOT TO SCALE



3 -

MAN GATE TYPICAL DETAIL

NOT TO SCALE

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1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

TITLE
PERMANENT FENCING DETAILS

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

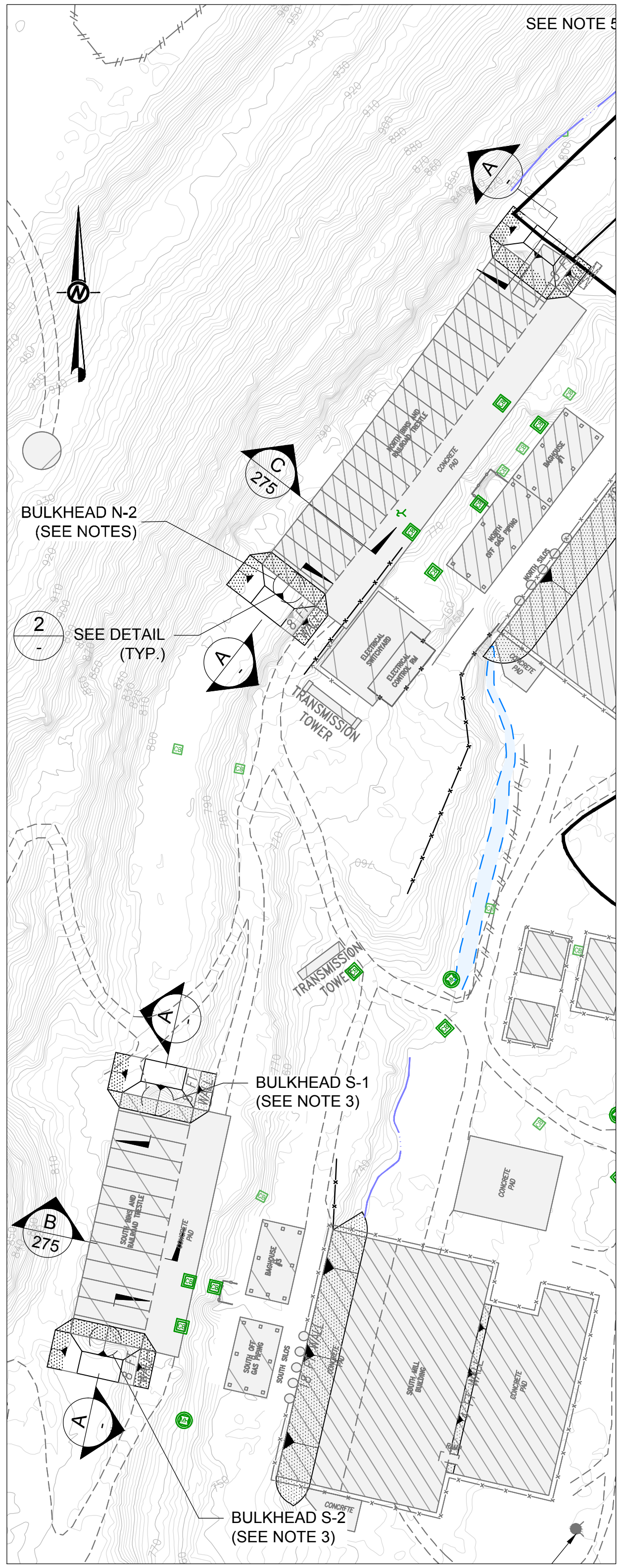
SHEET
IAR-260

NOTES:

1. REMOVE RAIL SUBGRADE OVERBURDEN LAYER AS INDICATED ON THIS AND OTHER DRAWINGS AND PLACE IN CLEAN SOIL OVERBURDEN STOCKPILE SHOWN ON SHEET IAR-240.
2. AT WEST END OF BULKHEADS IN NORTH BIN AREA, CONSTRUCT TOE OF SLOPE AS SHOWN OR TIE INTO ADJACENT HILLSIDE TO PROVIDE POSITIVE DRAINAGE AT ALL LOCATIONS.
3. DO NOT REGRADE WEST END OF BULKHEAD AREAS IN SOUTH BIN AREA WHEREVER SUCH REGRADING WOULD REQUIRE MOVING SLAG.
4. USE STRAW MATTING IN PLACE OF CRUSHED CONCRETE IF DIRECTED BY THE CONSTRUCTION MANAGER.
5. DERIVE FILL SOIL REMOVAL ZONE IMMEDIATELY ABOVE.
6. PLACE OVER ENTIRE CUT AND FILL AREA AT BULKHEADS UNLESS DIRECTED BY THE CONSTRUCTION MANAGER.

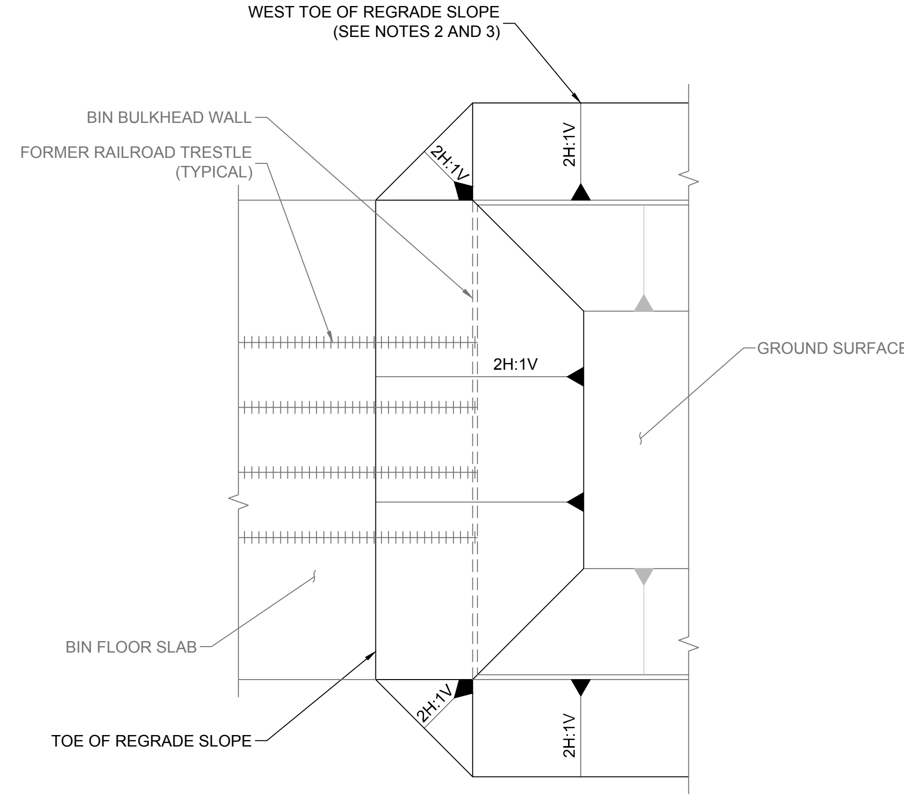
LEGEND:

- EXISTING ON-SITE ACCESS ROAD
- EXISTING SHEET PILE WALL
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- EXISTING FENCE (TO BE REMOVED)
- FENCE (PERMANENT)
- 2H:1V SLOPE SYMBOL
- BACKFILL AREA



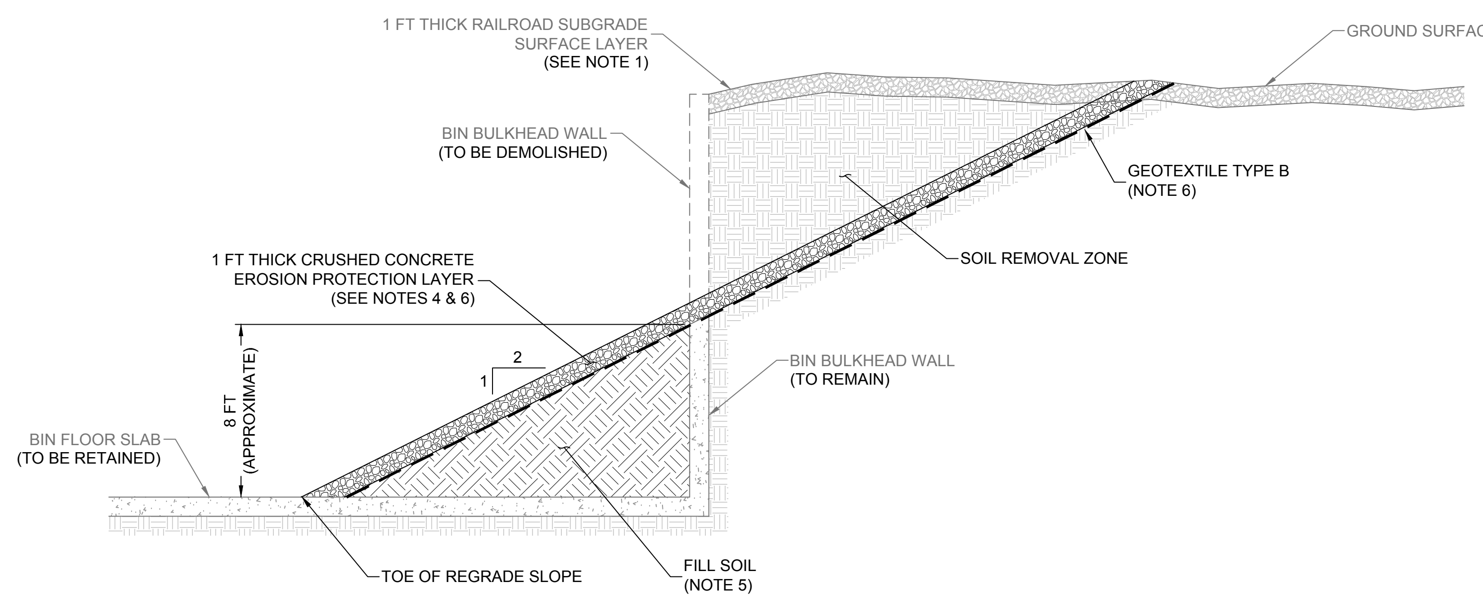
1 - BIN BULKHEAD DEMOLITION LOCATIONS

0 100 200 SCALE IN FEET



2 - BIN BULKHEAD TYPICAL REGRADE PLAN

0 20 40 SCALE IN FEET



A - TYPICAL BIN BULKHEAD DEMOLITION DETAIL SIDE ELEVATION

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3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
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1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

TITLE
BIN BULKHEAD
DEMOLITION DETAILS

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-270

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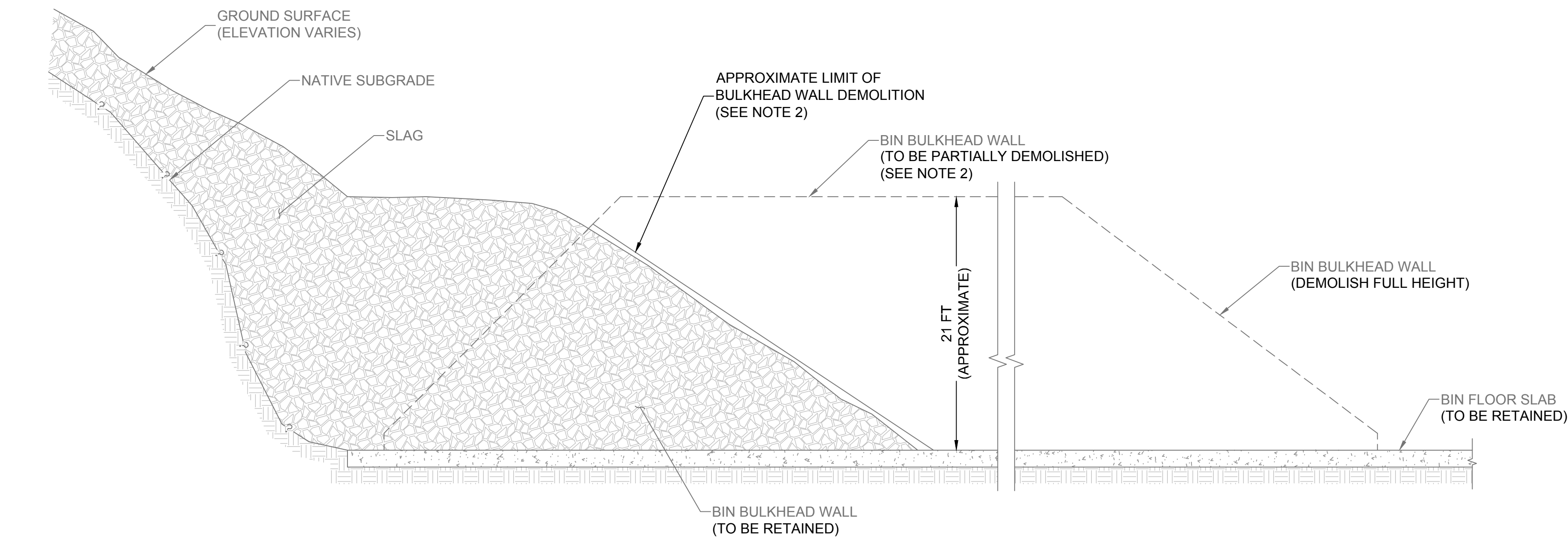
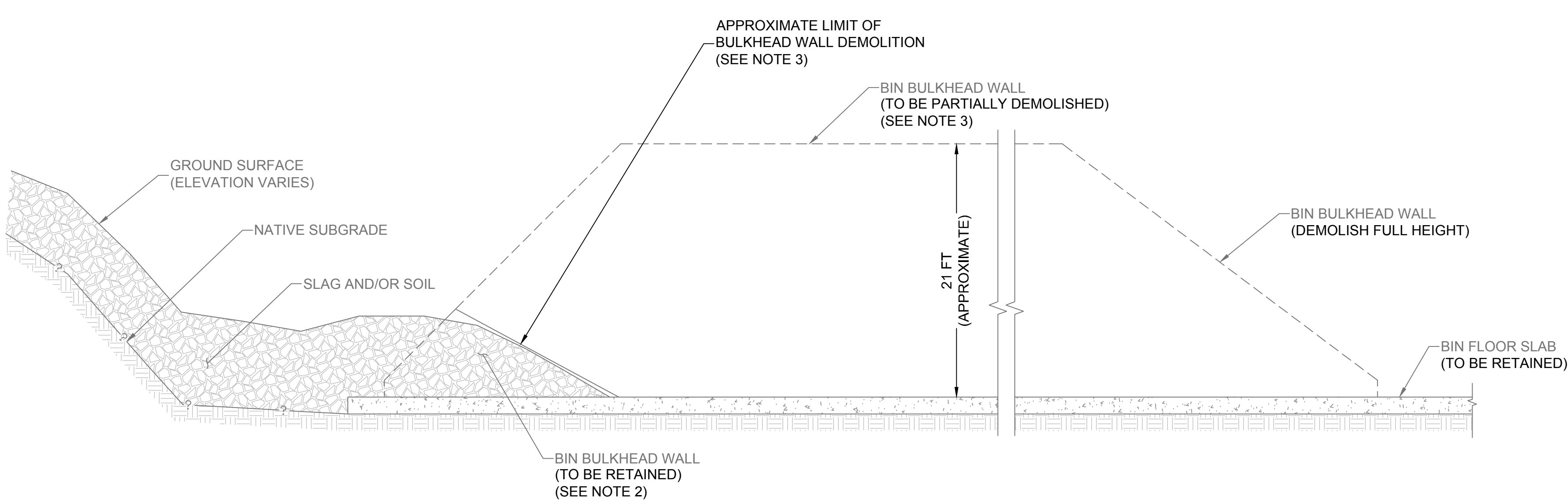
NOTES:
1. IN SOUTH BINS, DEMOLISH RAILROAD SUPPORT STRUCTURES THAT EXTEND ABOVE SLAG (SEE NOTE 2).
2. IN SOUTH BINS, REMOVE BIN SIDEWALLS BELOW EXISTING SLAG SURFACE ONLY TO EXTENT POSSIBLE WITHOUT EXCAVATING, REGRADING, OR OTHERWISE MOVING SLAG. REMAINING SIDEWALLS SHALL NOT EXTEND ABOVE SLAG SURFACE.
3. IN NORTH BINS, DEMOLISH RAILROAD SUPPORT STRUCTURES AND BIN SIDEWALLS COMPLETELY DOWN TO BASE SLAB, EXCEPT THAT WHERE SIDEWALLS ARE BURIED IN NATIVE HILLSIDE SOIL, DEMOLISH ONLY TO EXISTING SOIL GRADE. DO NOT DEMOLISH BASE SLAB. IF ONLY A MODEST AMOUNT (≤30 CY) OF SOIL REMAINS IN BACK OF EACH BIN, REMOVE IT AND FINISH SIDEWALL REMOVAL DOWN TO GRADE (TO BE DETERMINED BY CONTRACTOR AND CONSTRUCTION MANAGER).
4. CHAIN LINK FENCE, POSTS, AND ANCILLARY HARDWARE SHALL CONFORM TO THE REQUIREMENTS SHOWN ON SHEET IAR-260.
5. ALONG SIDES OF ELECTRICAL CONTROL ROOM, EXTEND RETAINED BLOCK WALL AND FENCING UNTIL VERTICAL DISTANCE BETWEEN SURFACE OF FLOOR SLAB AND ADJACENT GROUND SURFACE IS LESS THAN 2 FEET.



TYPICAL
BIN WALL DEMOLITION DETAIL -
SOUTH BINS
SIDE ELEVATION

B
270

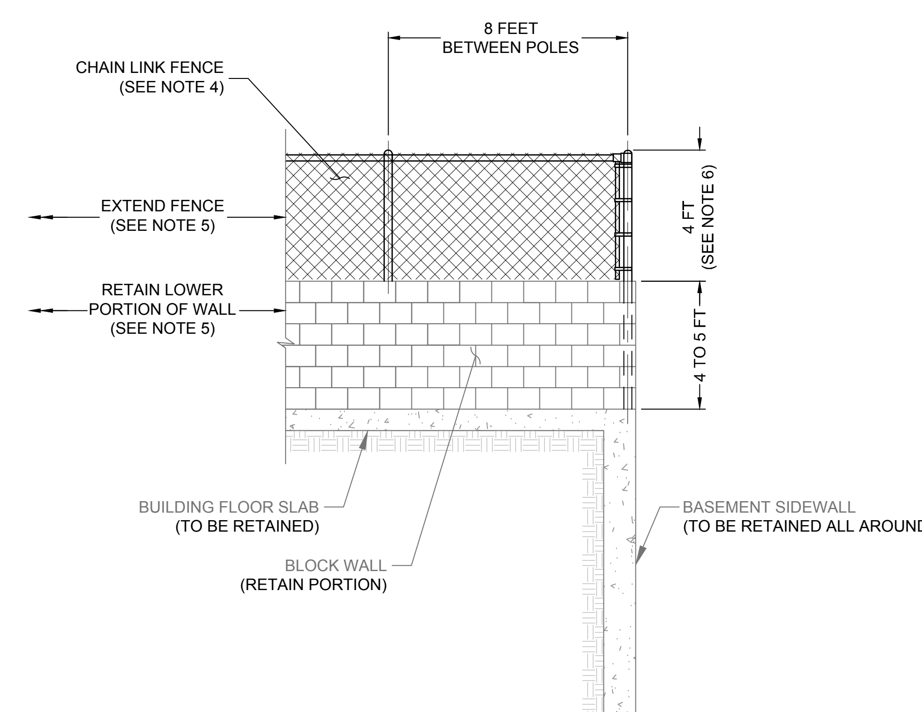
NOT TO SCALE



TYPICAL
BIN WALL DEMOLITION DETAIL -
NORTH BINS
SIDE ELEVATION

C
270

NOT TO SCALE



FALL PROTECTION FENCING
AT ELECTRICAL CONTROL ROOM
ELEVATION

A
250

NOT TO SCALE

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1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

TITLE
MISCELLANEOUS DETAILS

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET
IAR-275

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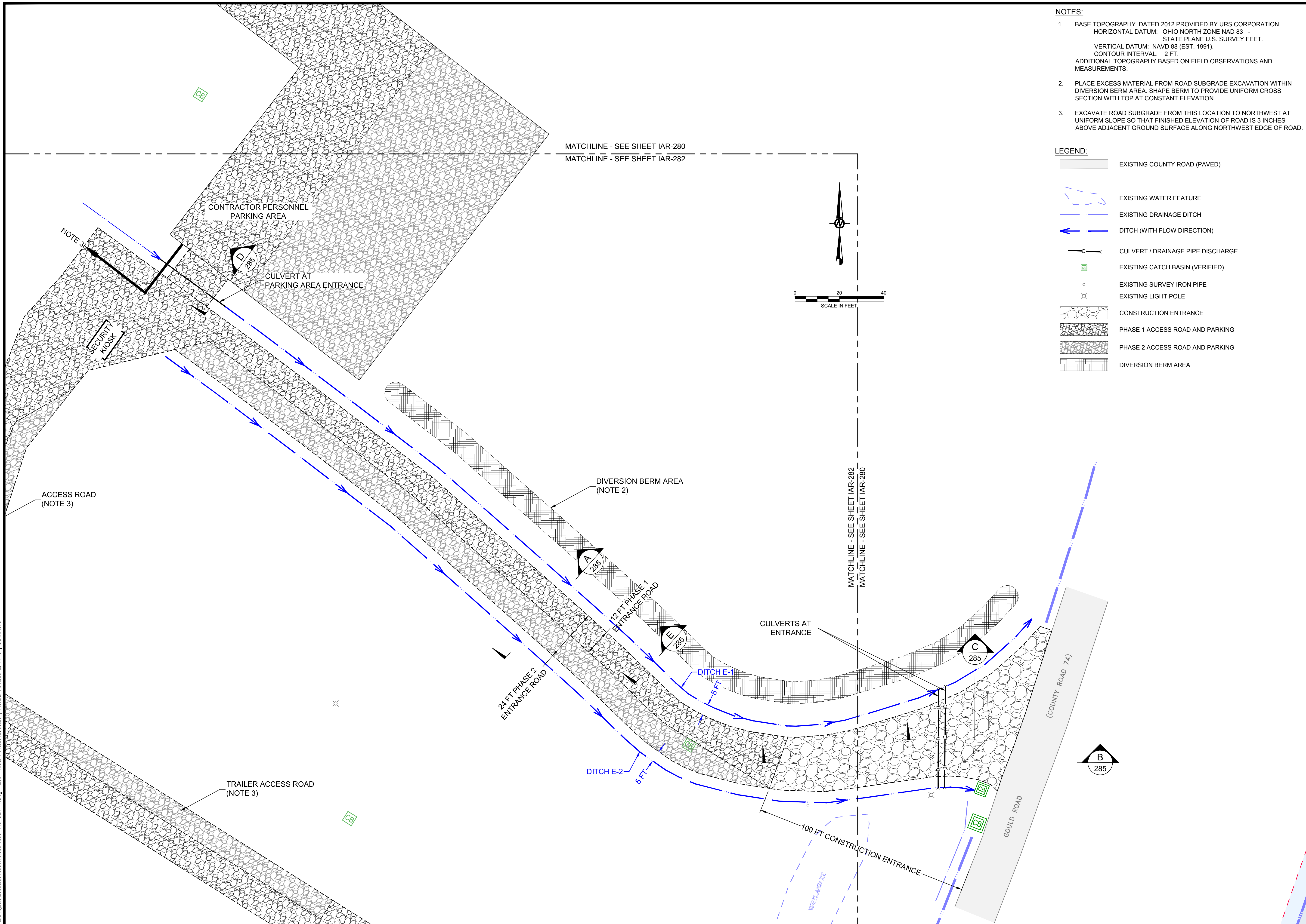

NOTES:

1. BASE TOPOGRAPHY DATED 2012 PROVIDED BY URS CORPORATION.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PLACE EXCESS MATERIAL FROM ROAD SUBGRADE EXCAVATION WITHIN DIVERSION BERM AREA. SHAPE BERM TO PROVIDE UNIFORM CROSS SECTION WITH TOP AT CONSTANT ELEVATION.
3. EXCAVATE ROAD SUBGRADE FROM THIS LOCATION TO NORTHWEST AT UNIFORM SLOPE SO THAT FINISHED ELEVATION OF ROAD IS 3 INCHES ABOVE ADJACENT GROUND SURFACE ALONG NORTHWEST EDGE OF ROAD.

LEGEND:

- EXISTING COUNTY ROAD (PAVED)
- EXISTING WATER FEATURE
- EXISTING DRAINAGE DITCH
- DITCH (WITH FLOW DIRECTION)
- CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING SURVEY IRON PIPE
- EXISTING LIGHT POLE
- CONSTRUCTION ENTRANCE
- PHASE 1 ACCESS ROAD AND PARKING
- PHASE 2 ACCESS ROAD AND PARKING
- DIVERSION BERM AREA

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PROJECT

FORMER SATRALLOY SITE

INTERIM ACTION

ABATEMENT & DEMOLITION

TITLE

SITE ENTRANCE ROAD DRAINAGE AND SURFACING PLAN SHEET 1

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET

IAR-280

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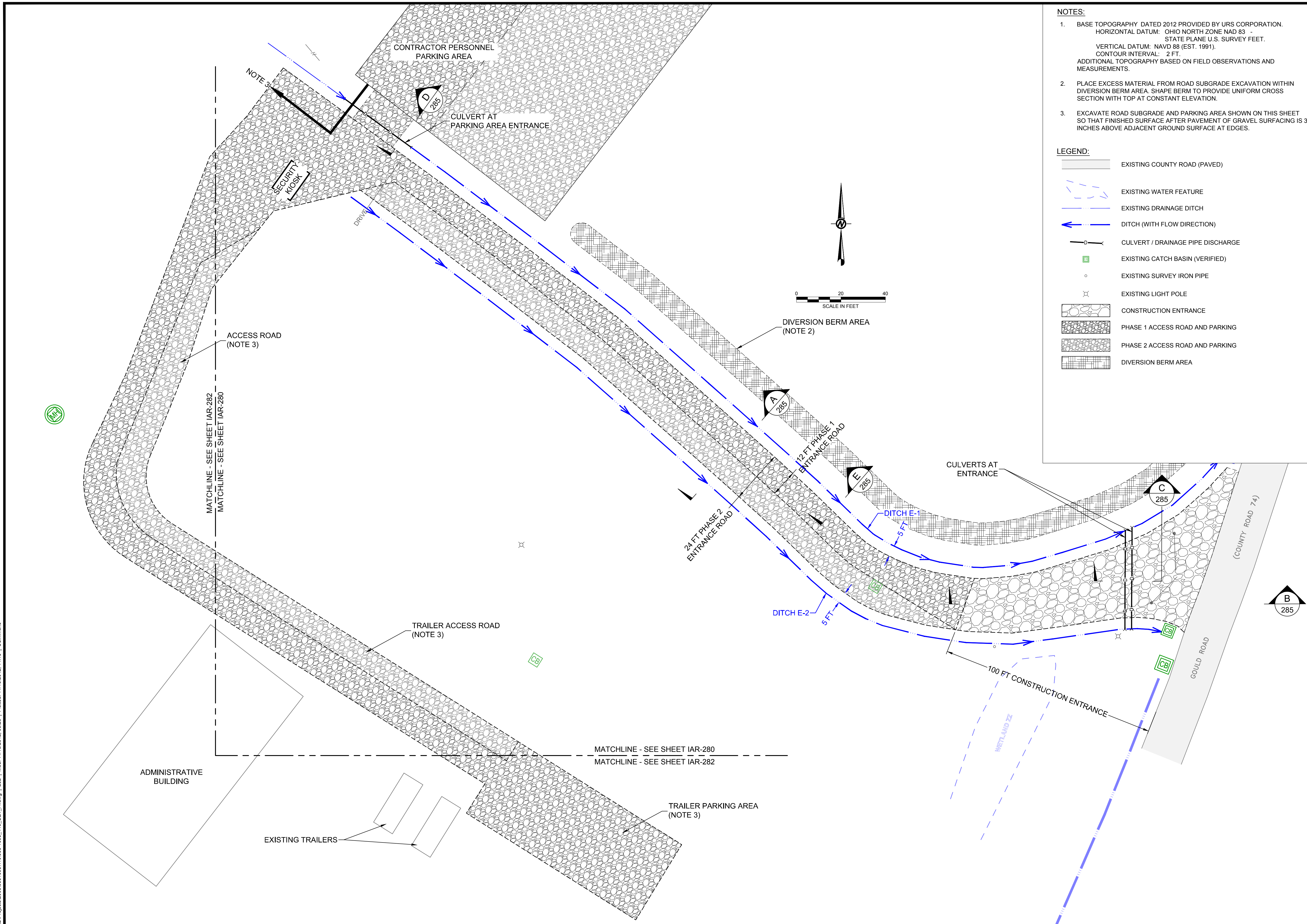

NOTES:

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   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PLACE EXCESS MATERIAL FROM ROAD SUBGRADE EXCAVATION WITHIN DIVERSION BERM AREA. SHAPE BERM TO PROVIDE UNIFORM CROSS SECTION WITH TOP AT CONSTANT ELEVATION.
3. EXCAVATE ROAD SUBGRADE AND PARKING AREA SHOWN ON THIS SHEET SO THAT FINISHED SURFACE AFTER PAVEMENT OF GRAVEL SURFACING IS 3 INCHES ABOVE ADJACENT GROUND SURFACE AT EDGES.

LEGEND:

- EXISTING COUNTY ROAD (PAVED)
- EXISTING WATER FEATURE
- EXISTING DRAINAGE DITCH
- DITCH (WITH FLOW DIRECTION)
- CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING SURVEY IRON PIPE
- EXISTING LIGHT POLE
- CONSTRUCTION ENTRANCE
- PHASE 1 ACCESS ROAD AND PARKING
- PHASE 2 ACCESS ROAD AND PARKING
- DIVERSION BERM AREA

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0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION ABATEMENT & DEMOLITION

TITLE
SITE ENTRANCE ROAD DRAINAGE AND SURFACING PLAN SHEET 2

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-282

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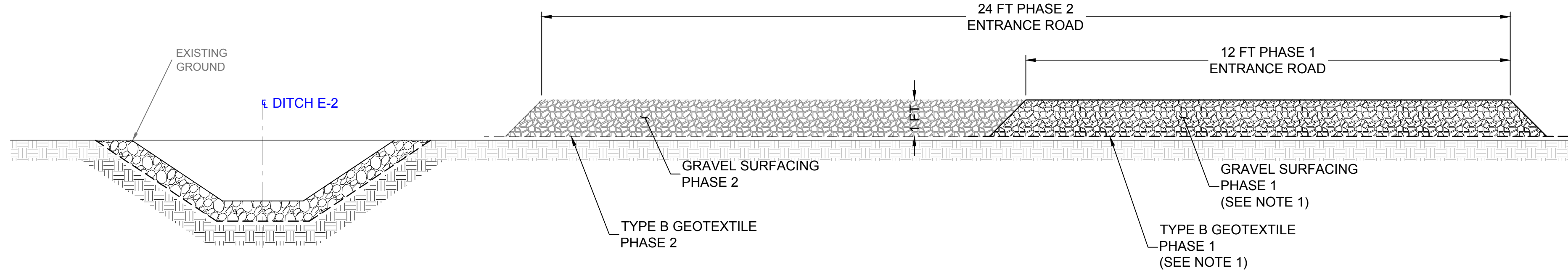
NOTES - SURFACING:

1. TYPICAL ALL ROADWAYS AND PARKING AREAS WHERE GRAVEL PLACEMENT IS INDICATED.

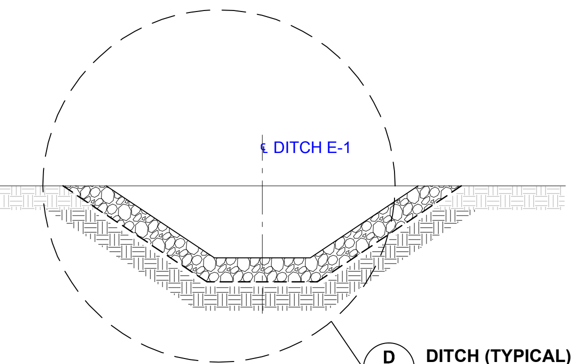
NOTES - CULVERTS:

1. INSTALL NEW CULVERTS WITH INVERTS AT SAME ELEVATION AS INVERT OF EXISTING CULVERT UNDER ENTRANCE ROAD, PROVIDED THAT MINIMUM COVER REQUIREMENTS AS SHOWN ARE SATISFIED. CONSTRUCTION MANAGER MAY MODIFY INVERT ELEVATIONS IN THE FIELD.

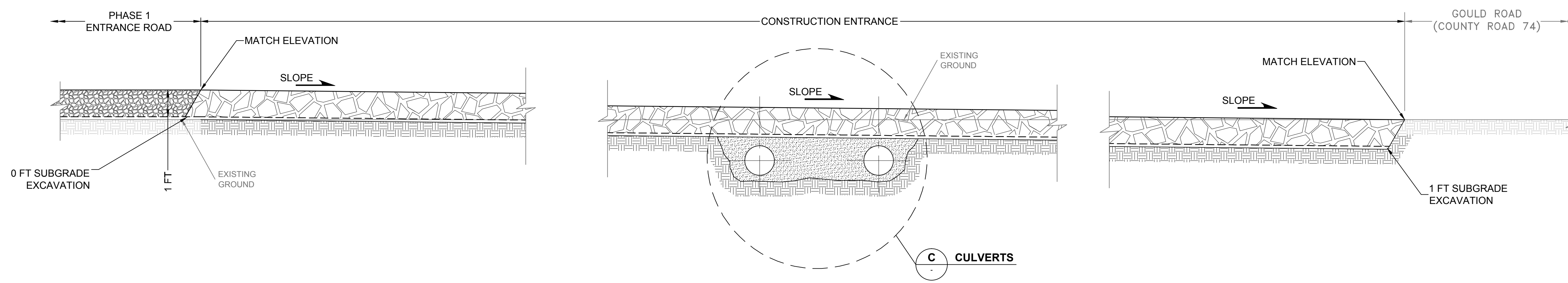


A 280 ENTRANCE ROAD TYPICAL SECTION

NOT TO SCALE

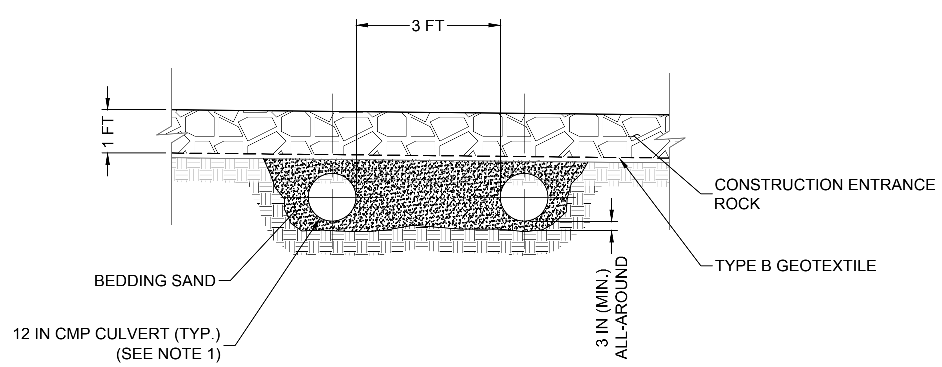


D - DITCH (TYPICAL)



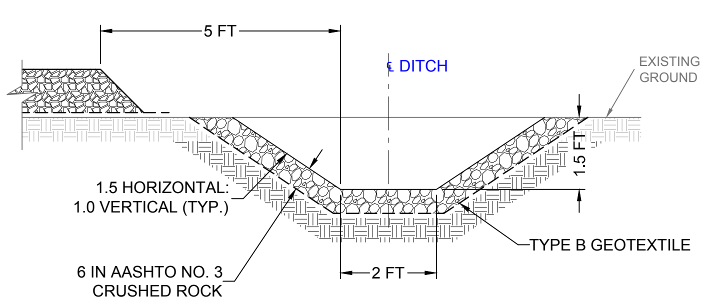
B 280 CONSTRUCTION ENTRANCE PROFILE

NOT TO SCALE



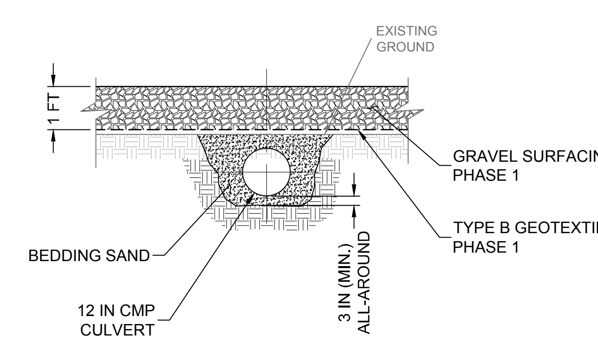
C 280 CULVERT TYPICAL SECTION

NOT TO SCALE



D 280 DITCH TYPICAL SECTION

NOT TO SCALE



E 280 CULVERT TYPICAL SECTION

NOT TO SCALE

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Golder Associates

GOLDER ASSOCIATES INC.
18300 NE UNION HILL RD, SUITE 200
REDMOND, WASHINGTON USA 98052
TEL (425) 883-0777
FAX (425) 882-5498

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
INTERIM ACTION
ABATEMENT & DEMOLITION

TITLE
SITE ENTRANCE ROAD
DRAINAGE AND
SURFACING DETAILS

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-285

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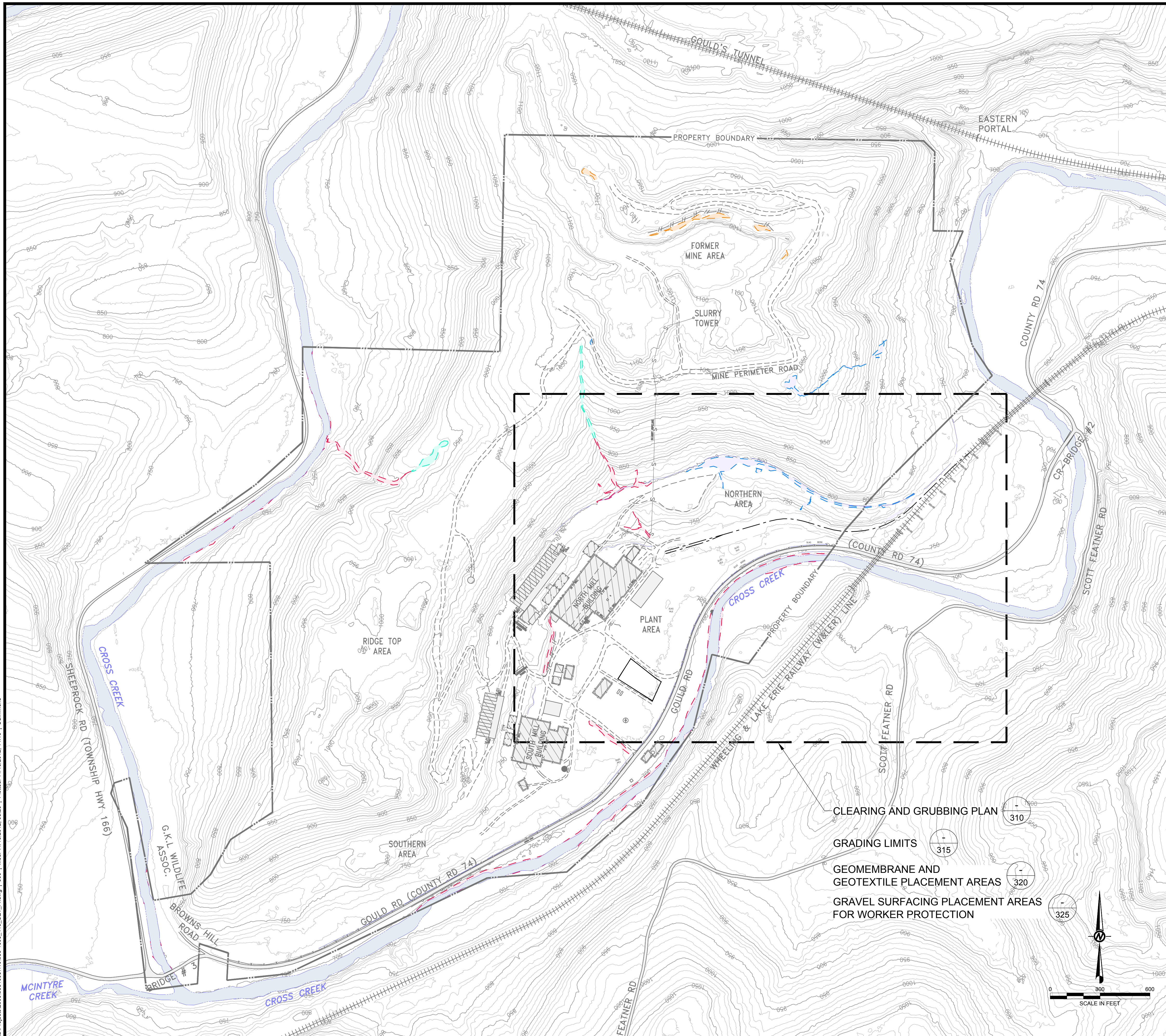

NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. WETLANDS DELINEATION PROVIDED BY WESTLAND RESOURCES, INC., ON DRAWING DATED MAY 30, 2007.
4. THE RIVER MILE MARKERS SHOWN FOR CROSS CREEK HEREON WERE VIA A GEODATABASE AVAILABLE ON THE OHIO STATE DNR WEBSITE, JUNE 2012.
5. SITE ADDRESS:
   4243 COUNTY ROAD #74
   MINGO JUNCTION, OH 43938

LEGEND:

EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
EXISTING ON-SITE ACCESS ROAD
EXISTING COUNTY ROAD (PAVED)
EXISTING RAILROAD
EXISTING SLURRY PIPELINE
CROSS CREEK
EXISTING FACILITY (TO BE DEMOLISHED)
FUTURE RAILROAD SPUR CENTERLINE (TO BE RECONSTRUCTED)

WETLAND LEGEND:
(SEE NOTE 3)

INTERMITTENT JURISDICTIONAL WATERS OF US [CORPS]
PERENNIAL JURISDICTIONAL WATERS OF US [CORPS]
ISOLATED WETLANDS (OEPA JURISDICTION)
OPEN WATER (NON-JURISDICTIONAL)

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4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
RAIL SPUR SUBGRADE

TITLE
RAIL SPUR SUBGRADE GENERAL ARRANGEMENT

PROJECT No.	053-1695.410		
REV. 4	SCALE	AS SHOWN	
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-300

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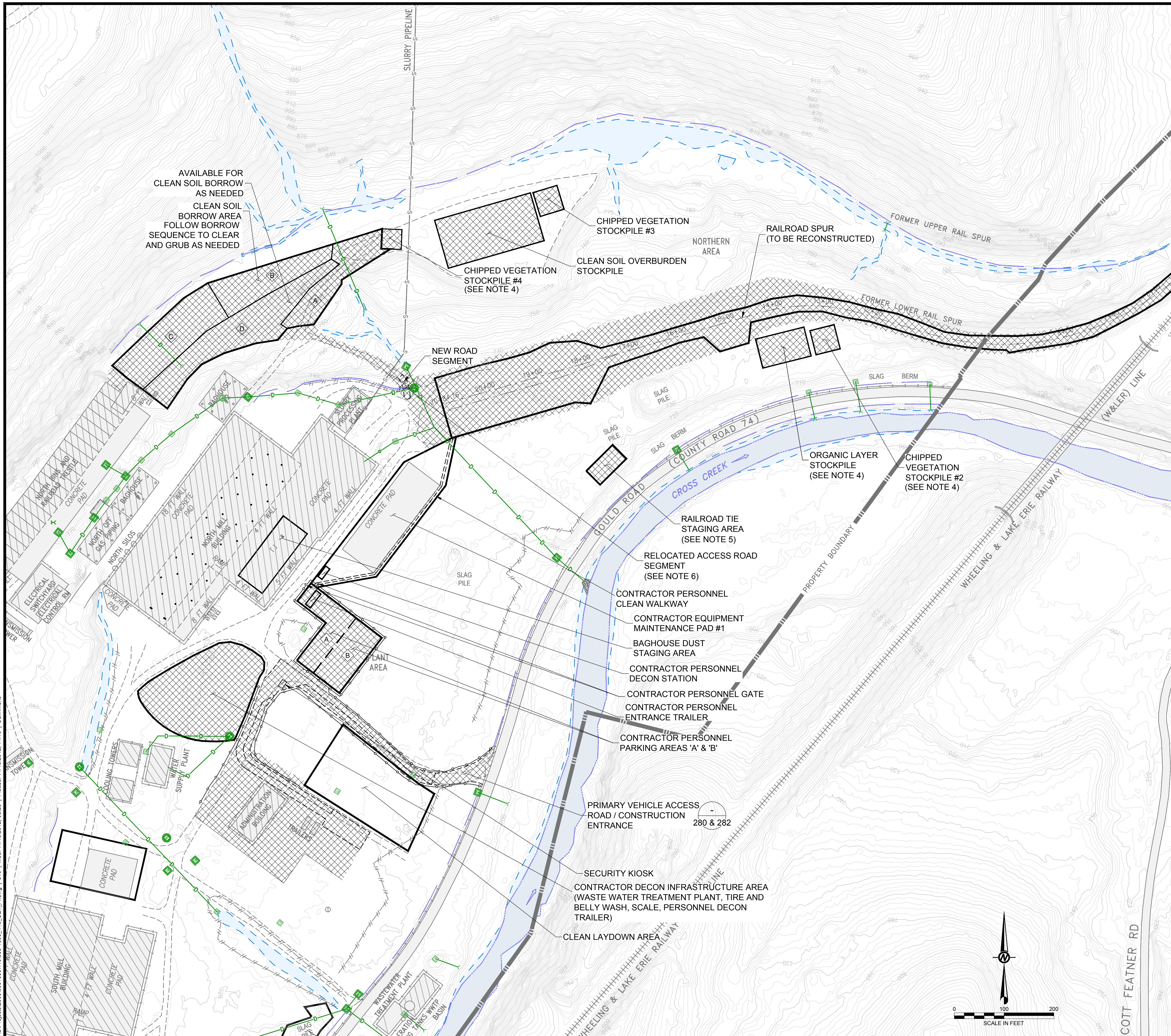

NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006. MODIFIED TO REMOVE FORMER RAIL SPUR CORRIDORS.
3. RAIL ALIGNMENT PROVIDED BY VANASSE HANGEN BRUSTLIN, INC. NOVEMBER 2, 2012.
4. PLACE TYPE B GEOTEXTILE ON EXISTING GROUND SURFACE IN CHIPPED VEGETATION AND ORGANIC LAYER STOCKPILE AREAS PRIOR TO STOCKPILING MATERIAL.
5. STACK RAILROAD TIES NEATLY WITHIN AREA SHOWN. STACK NOT EXCEEDING 16 FEET BY 16 FEET.
6. OBTAIN FILL FOR RELOCATED ACCESS ROAD FROM ADJACENT LOCAL SOIL PILES OR AS DIRECTED BY THE CONSTRUCTION MANAGER. PLACE AND COMPACT FILL AS NECESSARY TO PROVIDE A FIRM, TRAFFICABLE SURFACE FOR OPERATIONS. INSTALL 12-INCH CMP CULVERT UNDER RELOCATED ACCESS ROAD WITH BEDDING SAND AS SHOWN ON SECTION E, SHEET IAR-285. CONNECT DISCHARGE END OF NEW CULVERT DIRECTLY INTO EXISTING CATCH BASIN IMMEDIATELY DOWNSTREAM.

LEGEND:

EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
EXISTING ON-SITE ACCESS ROAD
EXISTING COUNTY ROAD (PAVED)
EXISTING RAILROAD
EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
EXISTING SLURRY PIPELINE
EXISTING UNDERGROUND DRAINAGE PIPE
EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
EXISTING MANHOLE (UNVERIFIED)
EXISTING MANHOLE (VERIFIED)
EXISTING CATCH BASIN (UNVERIFIED)
EXISTING CATCH BASIN (VERIFIED)
EXISTING FIRE HYDRANT
EXISTING GROUNDWATER WELL
CROSS CREEK
EXISTING DRAINAGE DITCH
EXISTING WATER FEATURE
EXISTING FACILITY (TO BE DEMOLISHED)
5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
CLEAR ONLY AREA (NO GRUB)
CLEAR AND GRUB AREA

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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
RAIL SPUR SUBGRADE

TITLE
CLEARING AND GRUBBING PLAN

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-310

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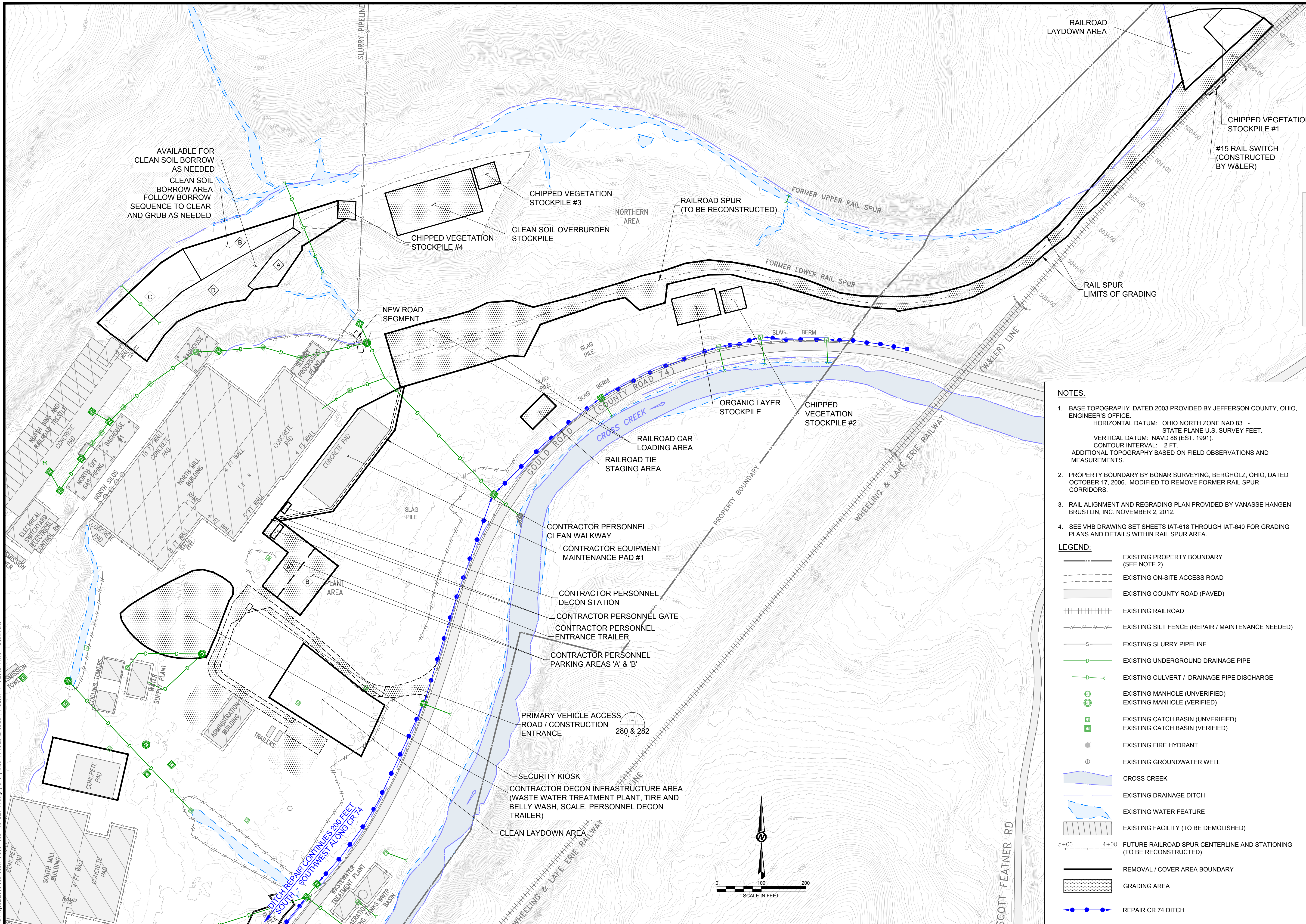

NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
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   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006. MODIFIED TO REMOVE FORMER RAIL SPUR CORRIDORS.
3. RAIL ALIGNMENT AND REGRADING PLAN PROVIDED BY VANASSE HANGEN BRUSTLIN, INC. NOVEMBER 2, 2012.
4. SEE VHB DRAWING SET SHEETS IAT-618 THROUGH IAT-640 FOR GRADING PLANS AND DETAILS WITHIN RAIL SPUR AREA.

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- EXISTING SLURRY PIPELINE
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING GROUNDWATER WELL
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- REMOVAL / COVER AREA BOUNDARY
- GRADING AREA
- REPAIR CR 74 DITCH

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REDMOND, WASHINGTON USA 98052
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FAX (425) 882-5498

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
RAIL SPUR SUBGRADE

TITLE
GRADING LIMITS

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-315

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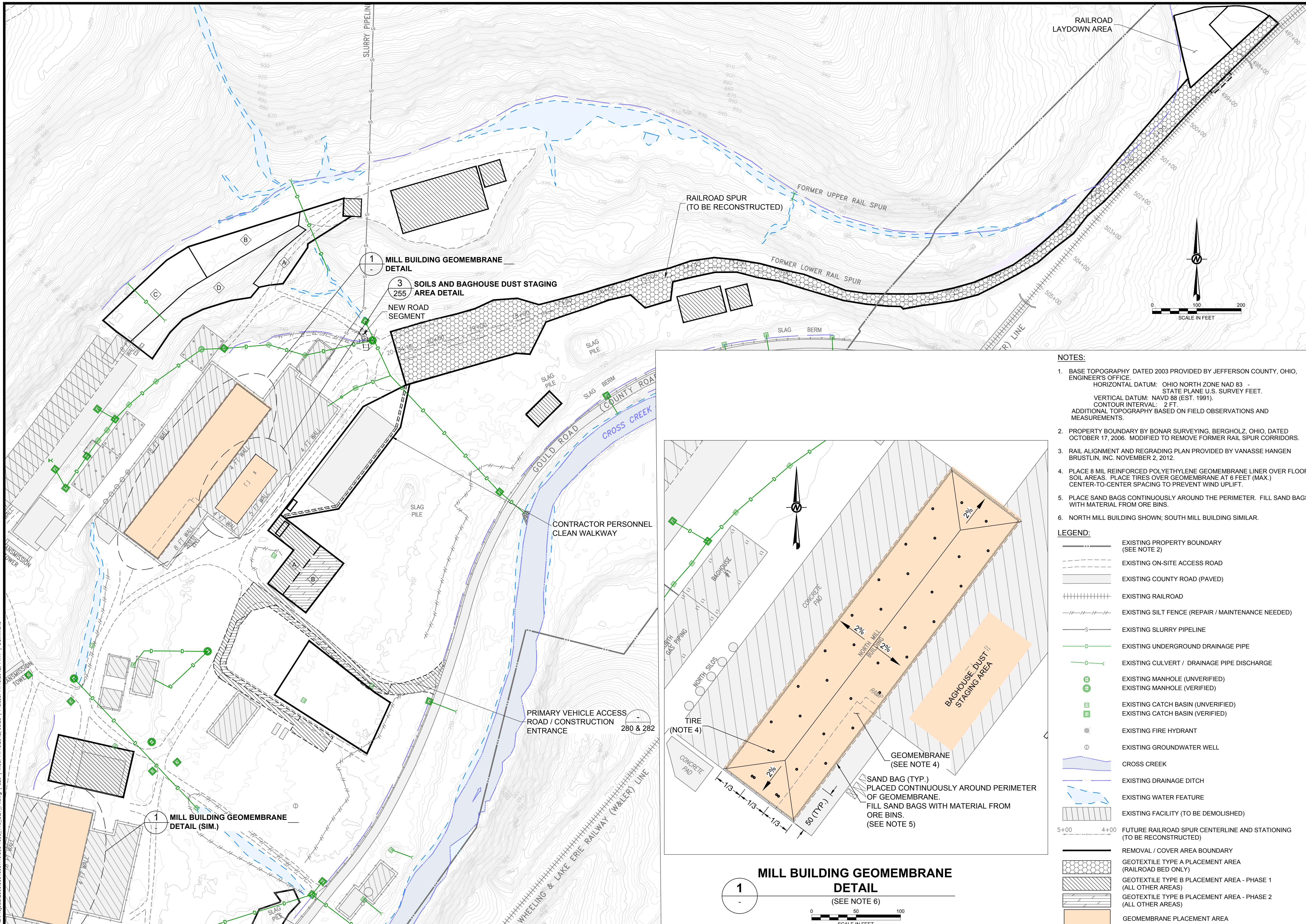

MILL BUILDING GEOMEMBRANE DETAIL

1 -

(SEE NOTE 6)

SCALE IN FEET: 0 50 100

NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE.
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   VERTICAL DATUM: NAVD 88 (EST. 1991).
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2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006. MODIFIED TO REMOVE FORMER RAIL SPUR CORRIDORS.
3. RAIL ALIGNMENT AND REGRADING PLAN PROVIDED BY VANASSE HANGEN BRUSTLIN, INC. NOVEMBER 2, 2012.
4. PLACE 8 MIL REINFORCED POLYETHYLENE GEOMEMBRANE LINER OVER FLOOR SOIL AREAS. PLACE TIRES OVER GEOMEMBRANE AT 6 FEET (MAX.) CENTER-TO-CENTER SPACING TO PREVENT WIND UPLIFT.
5. PLACE SAND BAGS CONTINUOUSLY AROUND THE PERIMETER. FILL SAND BAGS WITH MATERIAL FROM ORE BINS.
6. NORTH MILL BUILDING SHOWN; SOUTH MILL BUILDING SIMILAR.

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- EXISTING SLURRY PIPELINE
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING GROUNDWATER WELL
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- REMOVAL / COVER AREA BOUNDARY
- GEOTEXTILE TYPE A PLACEMENT AREA (RAILROAD BED ONLY)
- GEOTEXTILE TYPE B PLACEMENT AREA - PHASE 1 (ALL OTHER AREAS)
- GEOTEXTILE TYPE B PLACEMENT AREA - PHASE 2 (ALL OTHER AREAS)
- GEOMEMBRANE PLACEMENT AREA

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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
RAIL SPUR SUBGRADE

TITLE
GEOMEMBRANE AND GEOTEXTILE PLACEMENT AREAS

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAR-320

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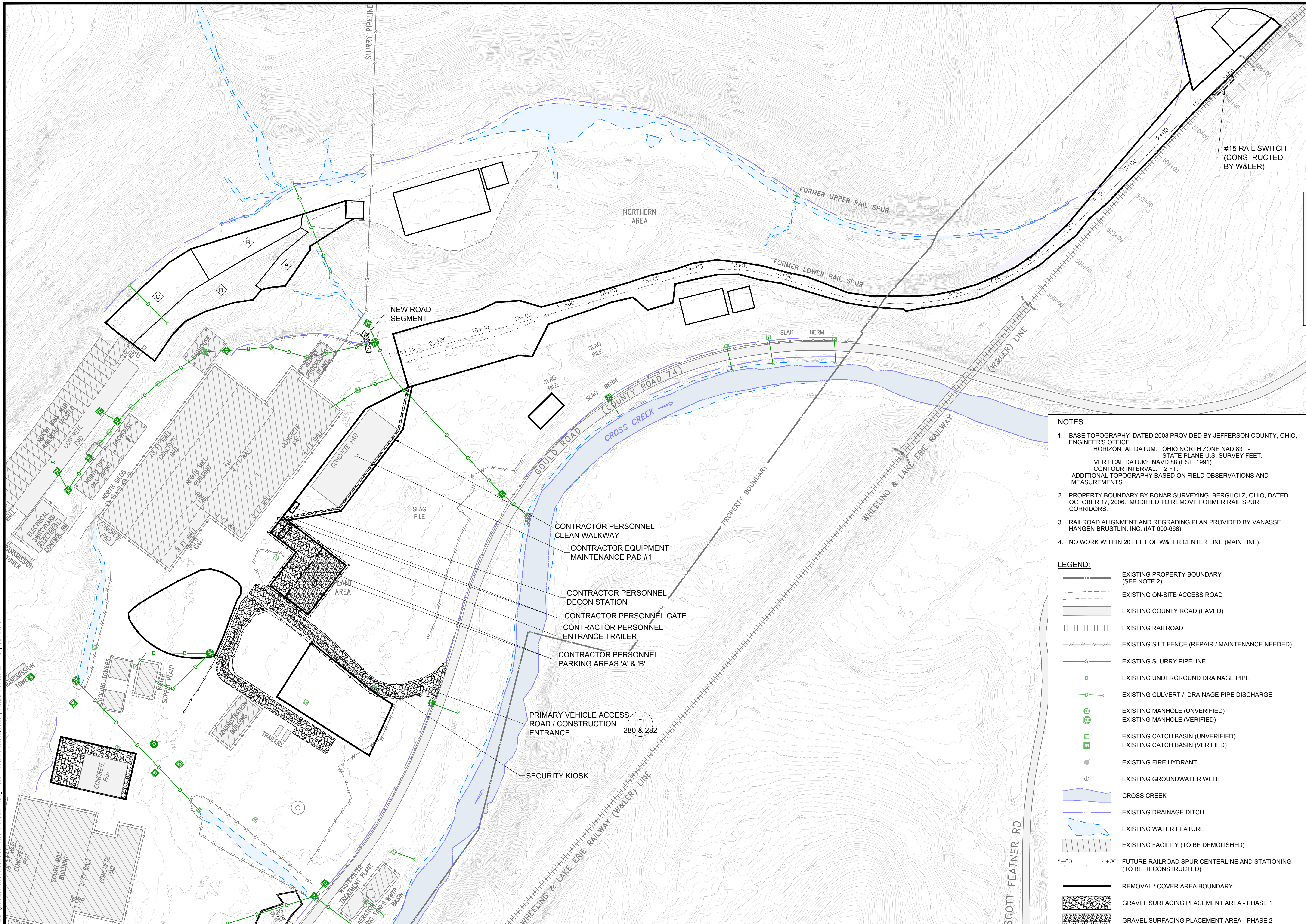

NOTES:

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   HORIZONTAL DATUM: OHIO NORTH ZONE NAD 83 - STATE PLANE U.S. SURVEY FEET.
   VERTICAL DATUM: NAVD 88 (EST. 1991).
   CONTOUR INTERVAL: 2 FT.
   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006. MODIFIED TO REMOVE FORMER RAIL SPUR CORRIDORS.
3. RAILROAD ALIGNMENT AND REGRADING PLAN PROVIDED BY VANASSE HANGEN BRUSTLIN, INC. (IAT 600-668).
4. NO WORK WITHIN 20 FEET OF W&LER CENTER LINE (MAIN LINE).

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- EXISTING SLURRY PIPELINE
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (UNVERIFIED)
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING GROUNDWATER WELL
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING WATER FEATURE
- EXISTING FACILITY (TO BE DEMOLISHED)
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- REMOVAL / COVER AREA BOUNDARY
- GRAVEL SURFACING PLACEMENT AREA - PHASE 1
- GRAVEL SURFACING PLACEMENT AREA - PHASE 2

Golder Associates

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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

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FOR FINAL REVIEW ONLY

PROJECT

FORMER SATRALLOY SITE

RAIL SPUR SUBGRADE

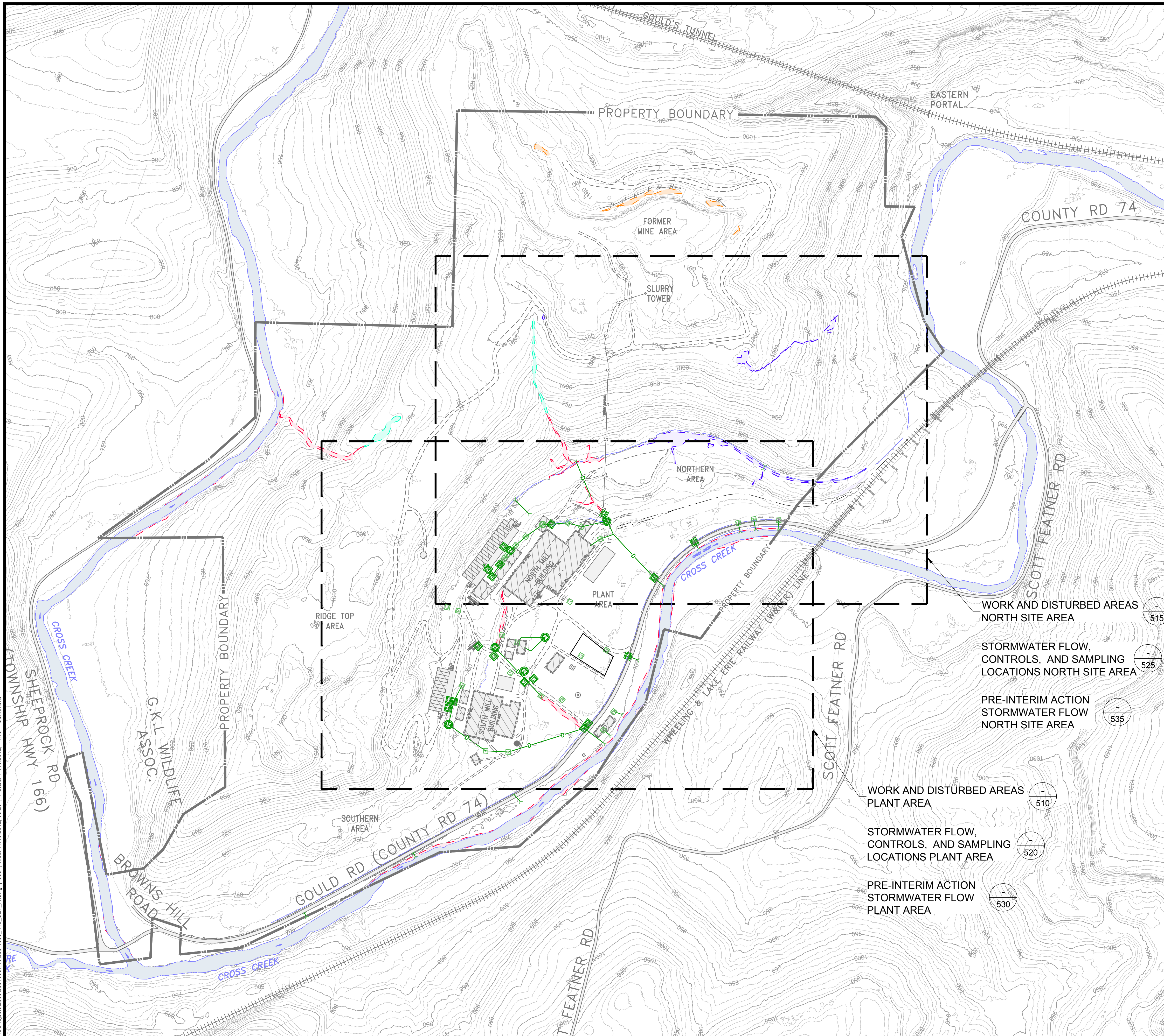
TITLE

GRAVEL SURFACING PLACEMENT AREAS FOR WORKER PROTECTION

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	FSS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET

IAR-325



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NOTES:

1. BASE TOPOGRAPHY DATED 2003 PROVIDED BY JEFFERSON COUNTY, OHIO, ENGINEER'S OFFICE .
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2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. WETLANDS DELINEATION PROVIDED BY WESTLAND RESOURCES, INC., ON DRAWING DATED MAY 30, 2007.
4. THE RIVER MILE MARKERS SHOWN FOR CROSS CREEK HEREON WERE VIA A GEODATABASE AVAILABLE ON THE OHIO STATE DNR WEBSITE, JUNE 2012.
5. SITE ADDRESS:
   4243 COUNTY ROAD #74
   MINGO JUNCTION, OH 43938

WETLAND LEGEND:
(SEE NOTE 3)

- INTERMITTENT JURISDICTIONAL WATERS OF US [CORPS]
- PERENNIAL JURISDICTIONAL WATERS OF US [CORPS]
- ISOLATED WETLANDS (OEPA JURISDICTION)
- OPEN WATER (NON-JURISDICTIONAL)

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- EXISTING SLURRY PIPELINE
- CROSS CREEK
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING MANHOLE (VERIFIED)
- EXISTING CATCH BASIN (UNVERIFIED)
- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING FACILITY (TO BE DEMOLISHED)
- FUTURE RAILROAD SPUR CENTERLINE (TO BE RECONSTRUCTED)
- STORMWATER SAMPLE LOCATION (SEE IAS-520 AND IAS-525)

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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
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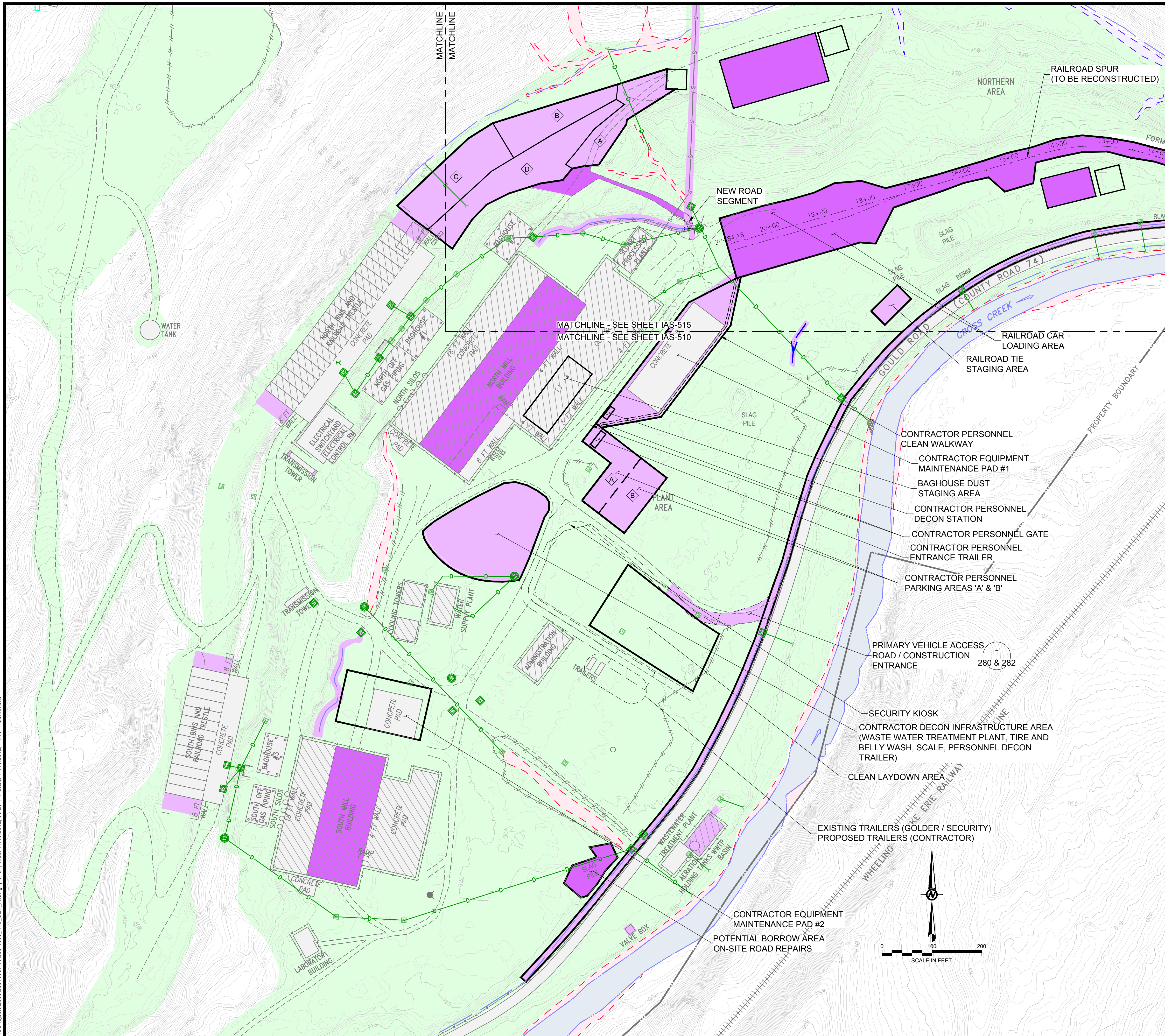
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
STORMWATER POLLUTION PREVENTION PLAN

TITLE
STORMWATER POLLUTION PREVENTION PLAN
GENERAL ARRANGEMENT

PROJECT No.	053-1695.410	
REV. 4	SCALE	AS SHOWN
DESIGN	VS	11-12-12
CADD	SES	11-12-12
CHECK	JDW	11-12-12
REVIEW		

SHEET
IAS-500



NOTES:

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   ADDITIONAL TOPOGRAPHY BASED ON FIELD OBSERVATIONS AND MEASUREMENTS.
2. PROPERTY BOUNDARY BY BONAR SURVEYING, BERGHOLZ, OHIO, DATED OCTOBER 17, 2006.
3. WETLANDS DELINEATION PROVIDED BY WESTLAND RESOURCES, INC., ON DRAWING DATED MAY 30, 2007.
4. AFTER REMOVING DUST FROM ALL OUTSIDE AREAS AROUND THE THREE BAGHOUSES AND OFF GAS PIPING, COVER THE AREAS WITH STRAW MATTING AND SEED.

WETLAND LEGEND:
(SEE NOTE 3)

- INTERMITTENT JURISDICTIONAL WATERS OF US [CORPS]
- PERENNIAL JURISDICTIONAL WATERS OF US [CORPS]
- ISOLATED WETLANDS (OEPA JURISDICTION)
- OPEN WATER (NON-JURISDICTIONAL)

LEGEND:

- EXISTING PROPERTY BOUNDARY (SEE NOTE 2)
- EXISTING ON-SITE ACCESS ROAD
- EXISTING COUNTY ROAD (PAVED)
- EXISTING RAILROAD
- 5+00 4+00 FUTURE RAILROAD SPUR CENTERLINE AND STATIONING (TO BE RECONSTRUCTED)
- EXISTING FACILITY (TO BE DEMOLISHED)
- EXISTING SLURRY PIPELINE
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- DRAINAGE SWALE (WITH FLOW DIRECTION) (SEE SHEET IAS-520)
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- DISTURBED AREA (<15 DAYS)
- DISTURBED AREA (>15 DAYS)
- WORK AREA (BORDER APPROXIMATE)

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Golder Associates
GOLDER ASSOCIATES INC.
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REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
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0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
STORMWATER POLLUTION PREVENTION PLAN

TITLE
WORK AND DISTURBED AREAS PLANT AREA

PROJECT No.	053-1695.410	
REV. 4	SCALE	AS SHOWN
DESIGN	VS	11-12-12
CADD	SES	11-12-12
CHECK	JDW	11-12-12
REVIEW		

SHEET
IAS-510

NOTES:

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3. WETLANDS DELINEATION PROVIDED BY WESTLAND RESOURCES, INC., ON DRAWING DATED MAY 30, 2007.
4. AFTER REMOVING DUST FROM ALL OUTSIDE AREAS AROUND THE THREE BAGHOUSES AND OFF GAS PIPING, COVER THE AREAS WITH STRAW MATTING AND SEED

WETLAND LEGEND:
(SEE NOTE 3)

- INTERMITTENT JURISDICTIONAL WATERS OF US [CORPS]
- PERENNIAL JURISDICTIONAL WATERS OF US [CORPS]
- ISOLATED WETLANDS (OEPA JURISDICTION)
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LEGEND:

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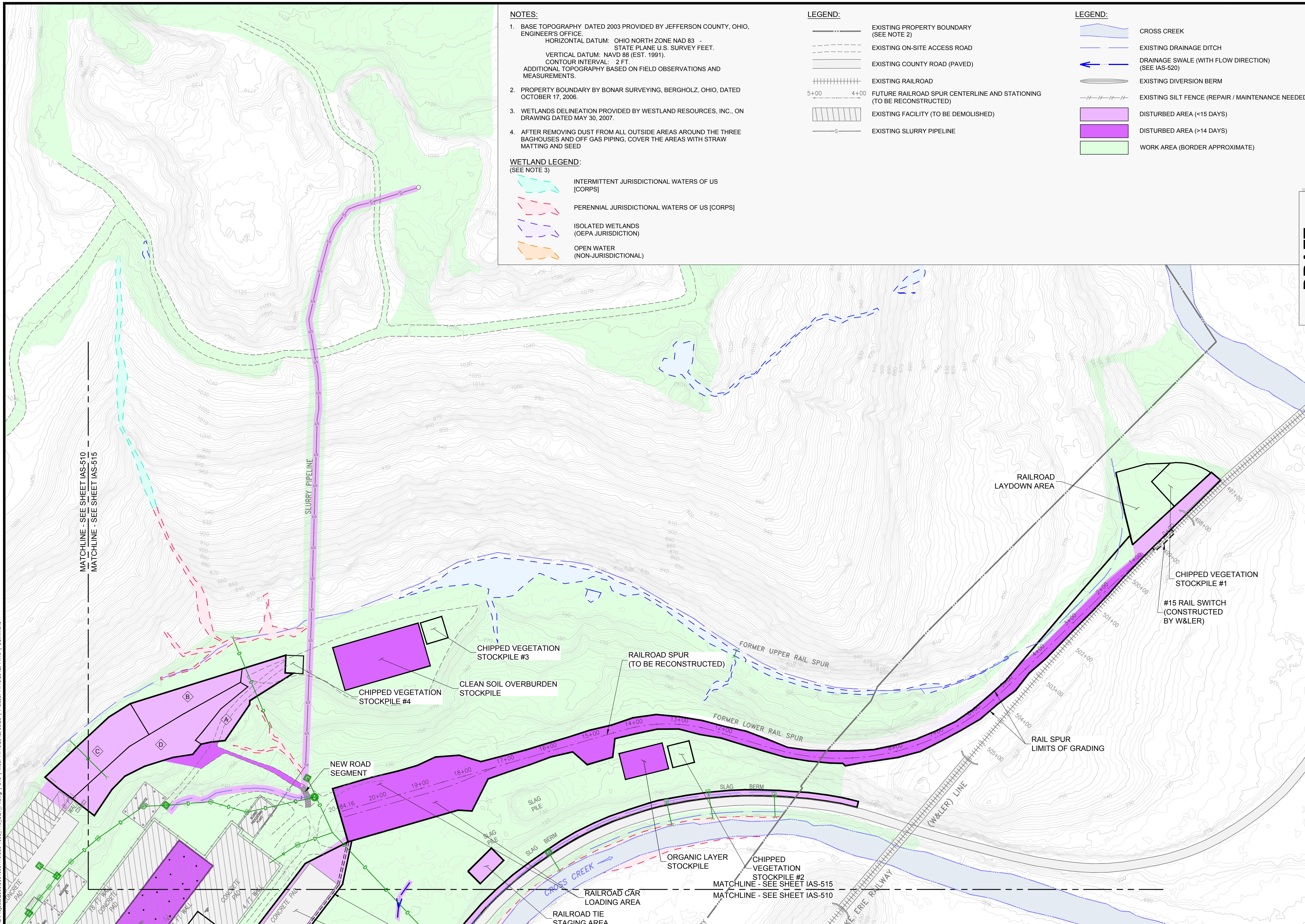
- EXISTING FACILITY (TO BE DEMOLISHED)
- EXISTING SLURRY PIPELINE

LEGEND:

- CROSS CREEK
- EXISTING DRAINAGE DITCH
- DRAINAGE SWALE (WITH FLOW DIRECTION) (SEE IAS-520)
- EXISTING DIVERSION BERM
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- DISTURBED AREA (<15 DAYS)
- DISTURBED AREA (>14 DAYS)
- WORK AREA (BORDER APPROXIMATE)



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PROJECT
FORMER SATRALLOY SITE
STORMWATER POLLUTION PREVENTION PLAN

TITLE
WORK AND DISTURBED AREAS NORTH SITE AREA

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	VS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET
IAS-515

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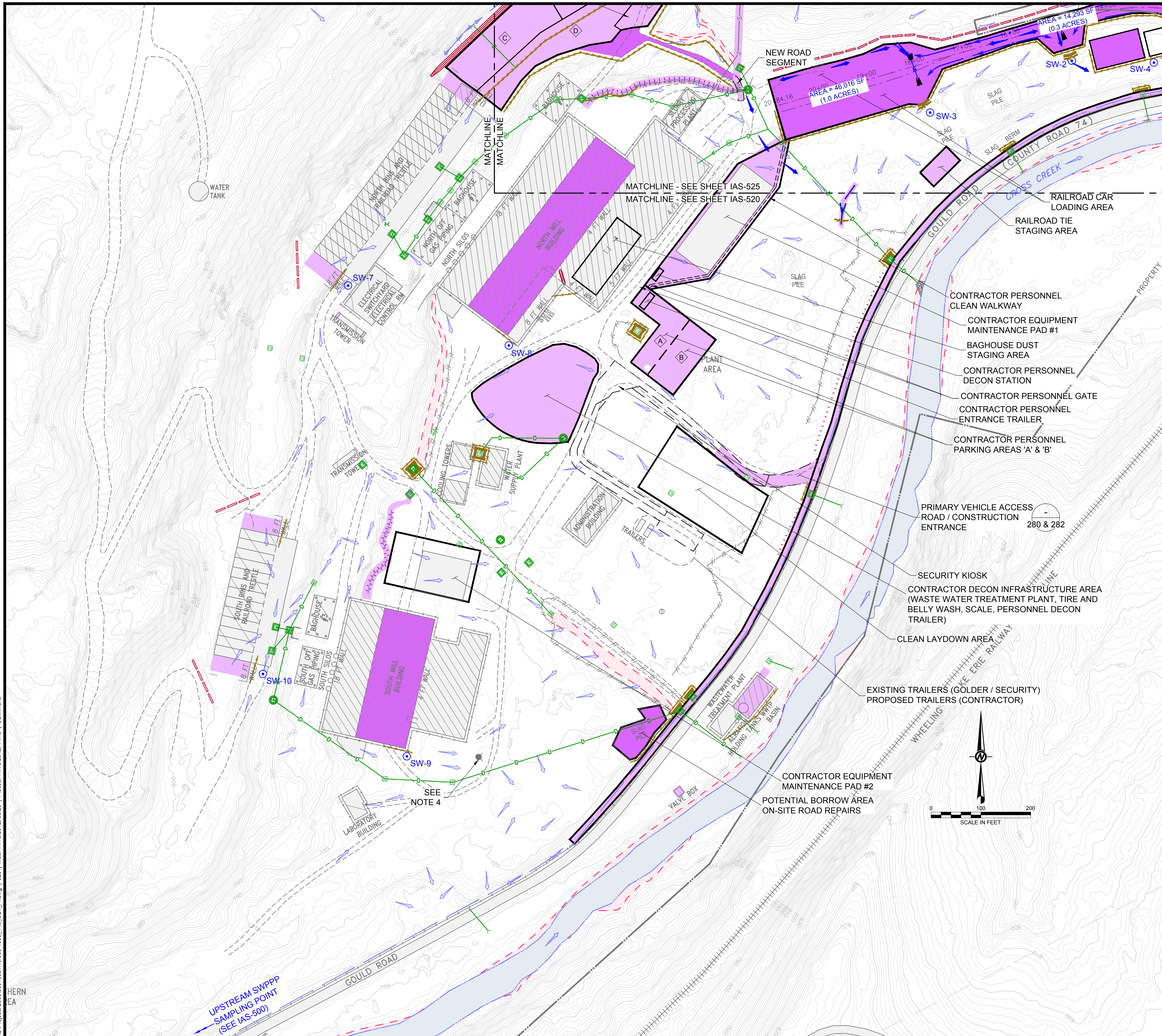

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WETLAND LEGEND:
(SEE NOTE 3)

- INTERMITTENT JURISDICTIONAL WATERS OF US [CORPS]
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- EXISTING MANHOLE (VERIFIED)
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- EXISTING CATCH BASIN (VERIFIED)
- EXISTING FIRE HYDRANT
- EXISTING GROUNDWATER WELL
- CROSS CREEK
- EXISTING DRAINAGE DITCH
- EXISTING DRAINAGE DITCH (TO BE REPAIRED) (SEE NOTE 4)
- DRAINAGE SWALE (WITH FLOW DIRECTION) 4/540
- SAND TUBE BERM
- EXISTING DIVERSION BERM (TO BE REPAIRED) 3/540
- DIVERSION BERM 3/540
- CULVERT / DRAINAGE PIPE DISCHARGE
- EXISTING SILT FENCE (REPAIR / MAINTENANCE NEEDED)
- SILT FENCE 2/540
- REINFORCED SILT FENCE 2/540
- STRAW BALE BARRIER WITH SILT FENCE 1/540
- PRE-INTERIM ACTION STORMWATER FLOW DIRECTION
- POST-INTERIM ACTION STORMWATER FLOW DIRECTION
- SW-8 DISTURBED AREA STORMWATER SAMPLE LOCATION
- DISTURBED AREA (<15 DAYS)
- DISTURBED AREA (>14 DAYS)

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PROJECT
FORMER SATRALLOY SITE
STORMWATER POLLUTION PREVENTION PLAN

TITLE
STORMWATER FLOWS, CONTROLS, AND SAMPLING LOCATIONS PLANT AREA

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
DESIGN	VS		11-12-12
CADD	SES		11-12-12
CHECK	JDW		11-12-12
REVIEW			

SHEET
IAS-520

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- EXISTING DRAINAGE DITCH (TO BE REPAIRED) (SEE NOTE 4)

LEGEND:

- DRAINAGE SWALE (WITH FLOW DIRECTION) 4/540
- TUBE SAND BERM
- EXISTING DIVERSION BERM (TO BE REPAIRED) 3/540
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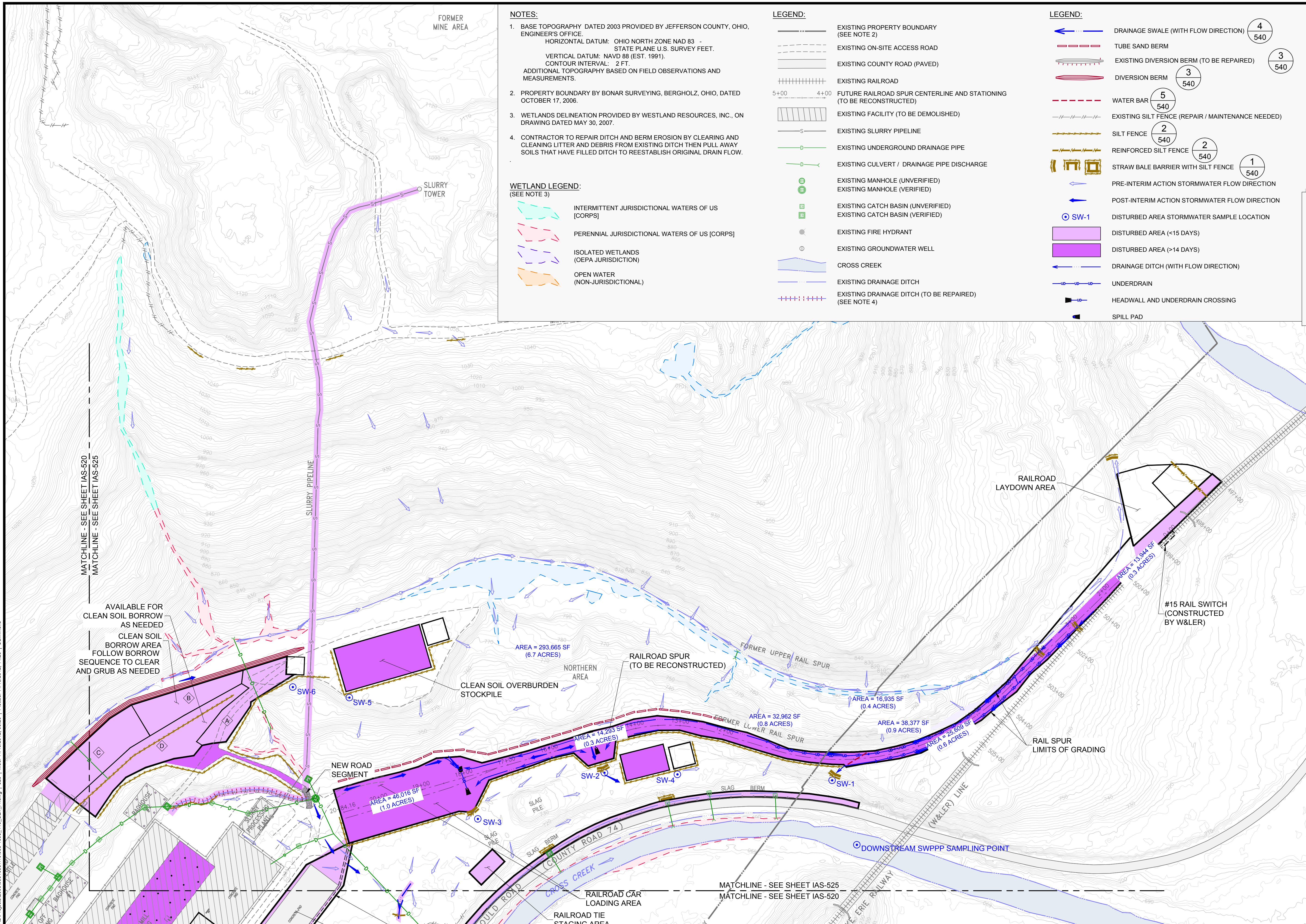
- UNDERDRAIN
- HEADWALL AND UNDERDRAIN CROSSING
- SPILL PAD



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PROJECT
FORMER SATRALLOY SITE
STORMWATER POLLUTION PREVENTION PLAN

TITLE
STORMWATER FLOWS, CONTROLS, AND SAMPLING LOCATIONS NORTH SITE AREA

PROJECT No. 053-1695.410		
REV. 4	SCALE	AS SHOWN
DESIGN	VS	11-12-12
CADD	SES	11-12-12
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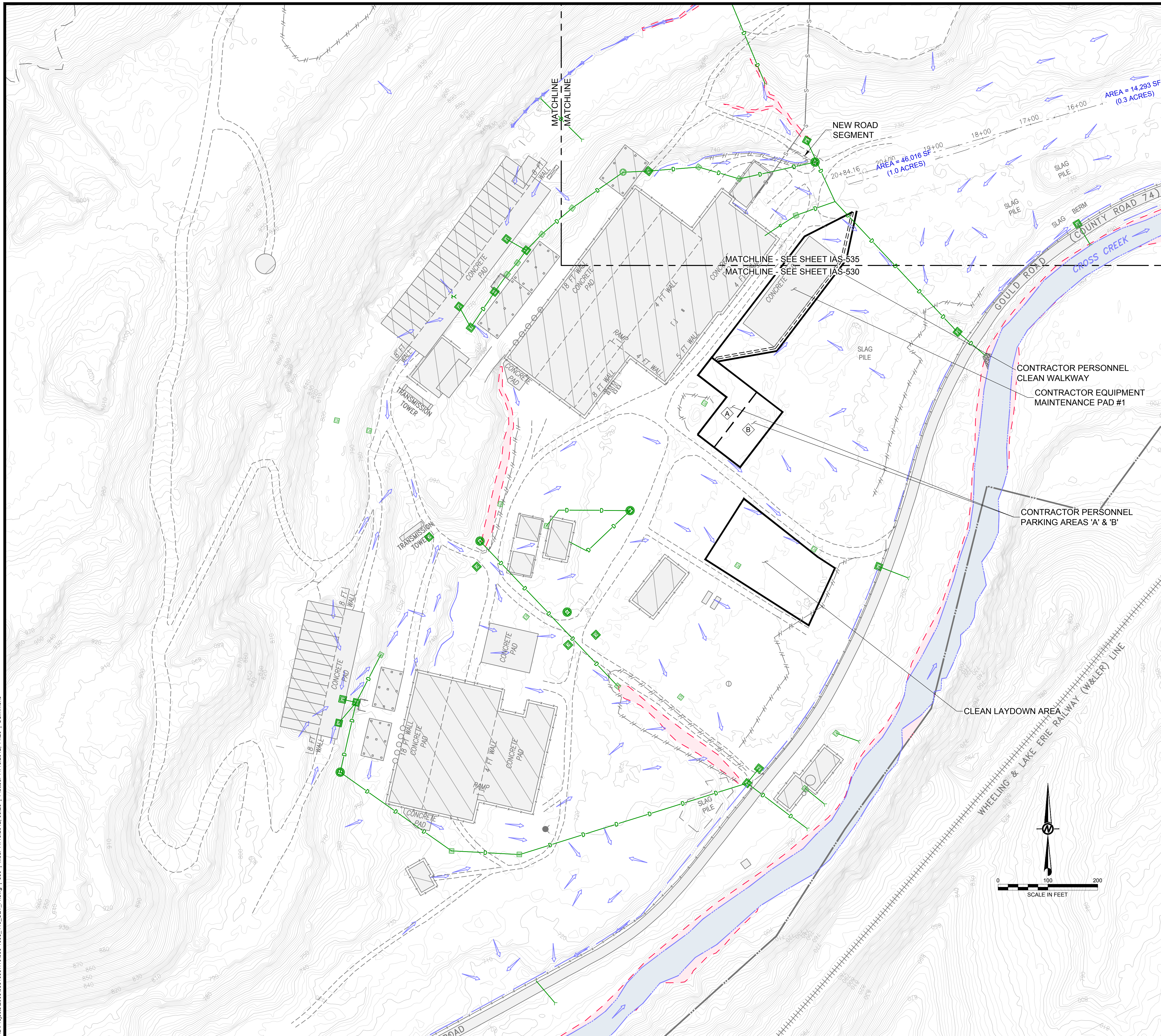
REVIEW		

SHEET
IAS-525



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PROJECT
FORMER SATRALLOY SITE
STORMWATER POLLUTION PREVENTION PLAN

TITLE
PRE-INTERIM ACTION STORMWATER FLOW PLANT AREA

PROJECT No.	053-1695.410		
REV. 4	SCALE	AS SHOWN	
DESIGN	VS	11-12-12	
CADD	SES	11-12-12	
CHECK	JDW	11-12-12	
REVIEW			

SHEET
IAS-530

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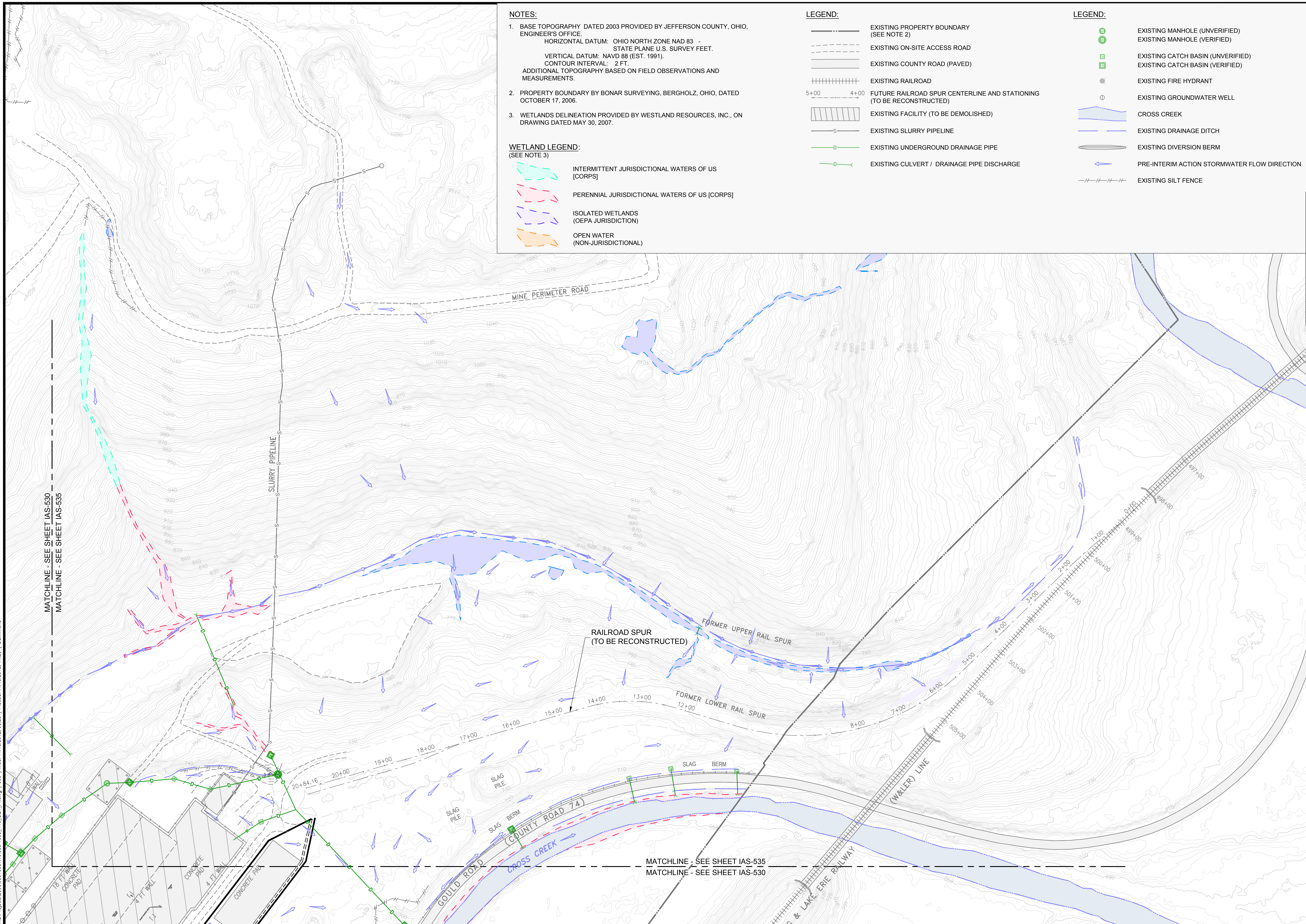

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LEGEND:

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PROJECT

FORMER SATRALLOY SITE
STORMWATER POLLUTION
PREVENTION PLAN

TITLE

PRE-INTERIM ACTION STORMWATER FLOWS NORTH SITE AREA

PROJECT No.	053-1695.410		
REV.	4	SCALE	AS SHOWN
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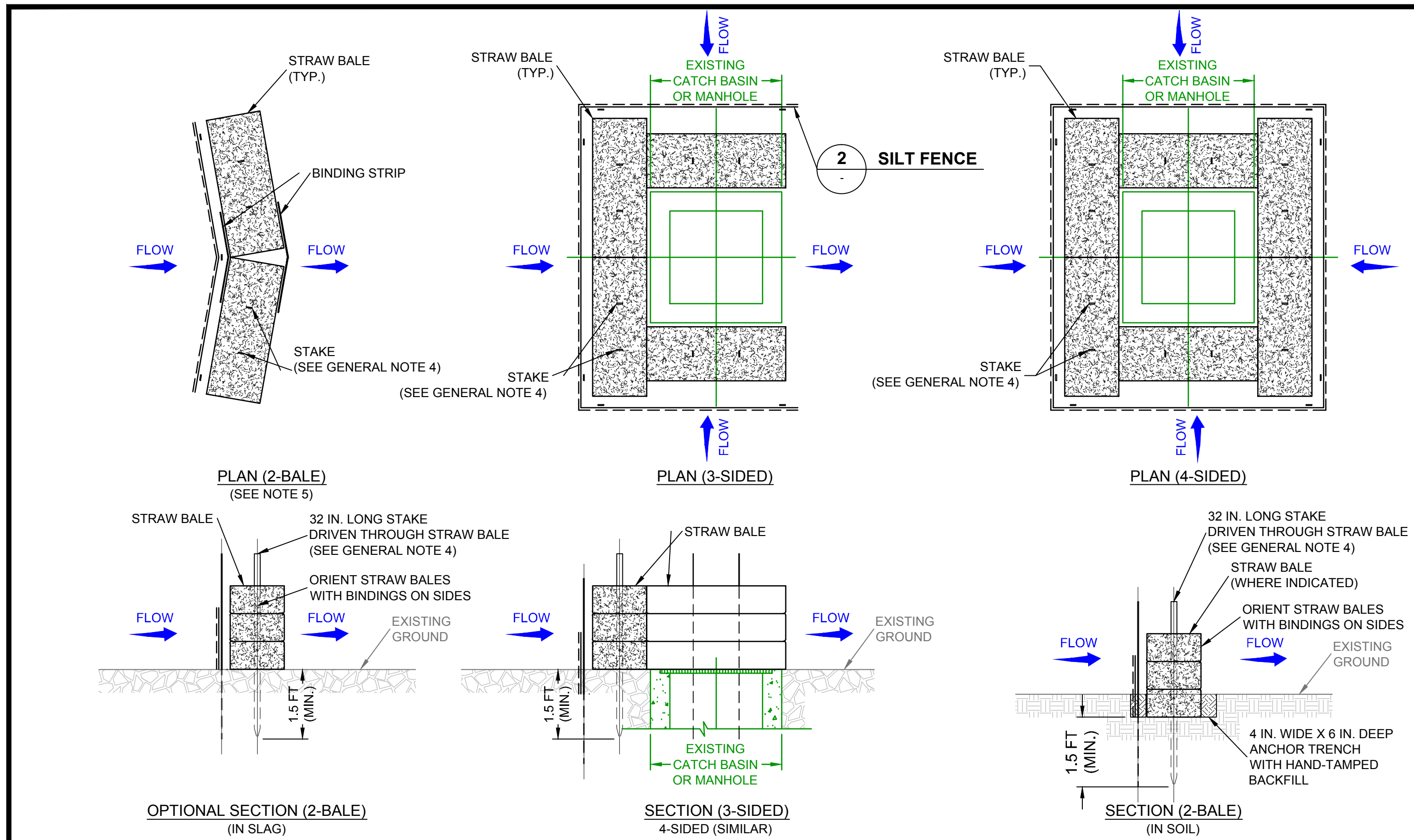
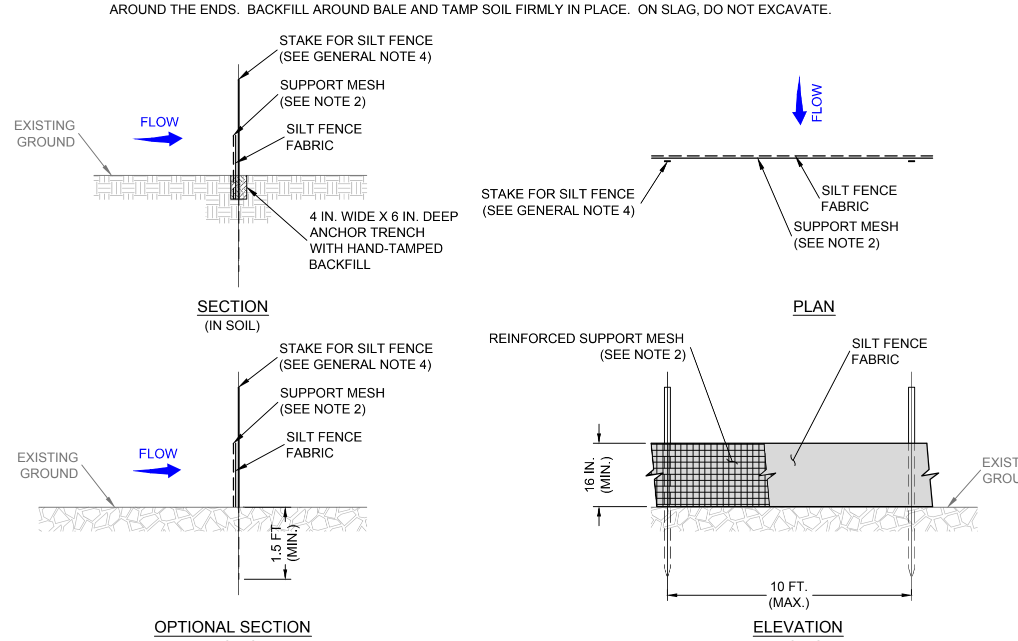


STRAW BALE BARRIER WITH SILT FENCE TYPICAL DETAILS

1 (520, 525) NOT TO SCALE

NOTES - STRAW BALE BARRIER:

1. ALL STRAW MATERIAL SHALL BE IN AN AIR-DRIED CONDITION FREE OF NOXIOUS WEEDS, SEEDS, AND OTHER DELETERIOUS MATERIALS. HAY SHALL NOT BE ACCEPTABLE.
2. PLACE BALES IN ROW DOWN SLOPE OF SILT FENCE AT LOCATIONS SHOWN ON THE PLAN VIEW DRAWINGS.
3. PLACE BALES TIGHTLY END-TO-END TO PREVENT GAPS.
4. AT THE ENDS OF BALE ROWS, WHERE APPLICABLE, PLACE BALES IN EXCAVATIONS A MINIMUM OF 1 FOOT DEEP TO PREVENT FLOW AROUND THE ENDS. BACKFILL AROUND BALE AND TAMP SOIL FIRMLY IN PLACE. ON SLAG, DO NOT EXCAVATE.

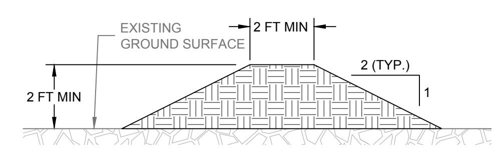


SILT FENCE TYPICAL DETAILS

2 (520, 525) NOT TO SCALE

NOTES - SILT FENCE:

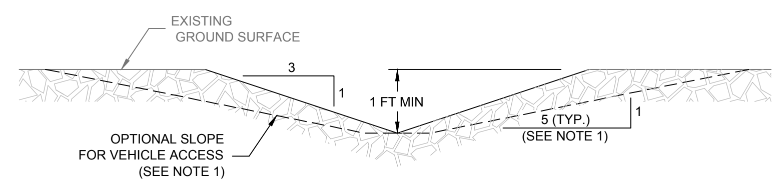
1. SILT FENCE FABRIC SHALL CONFORM TO THE REQUIREMENTS OF SECTION 712.09 GEOTEXTILE TYPE C OF THE THE OHIO DEPARTMENT OF TRANSPORTATION *2010 CONSTRUCTION AND MATERIAL SPECIFICATIONS* (ODOT *2010 SPECIFICATIONS*). OTHER COMPONENTS SHALL BE AS RECOMMENDED BY SILT FENCE MANUFACTURER.
2. SUPPORT MESH SHALL BE REQUIRED IF SPACING BETWEEN POSTS IS INCREASED OR IF IN THE OPINION OF THE CONSTRUCTION MANAGER, THE SILT FENCE IS NOT ADEQUATELY SUPPORTED TO FUNCTION AS INTENDED.
3. SUPPORT MESH SHALL BE FLUSH WITH STRAW BALES.
4. SILT FENCE BEING INSTALLED IN SLAG AREA MAY NEED STEEL POSTS TO PENETRATE INTO GROUND OR DRILL HOLE TO SET WOODEN STAKE.



NOTE:
REPAIR EXISTING DIVERSION BERMS PER MINIMUM DIMENSIONS SHOWN

DIVERSION BERM TYPICAL SECTION

3 (520, 525) NOT TO SCALE

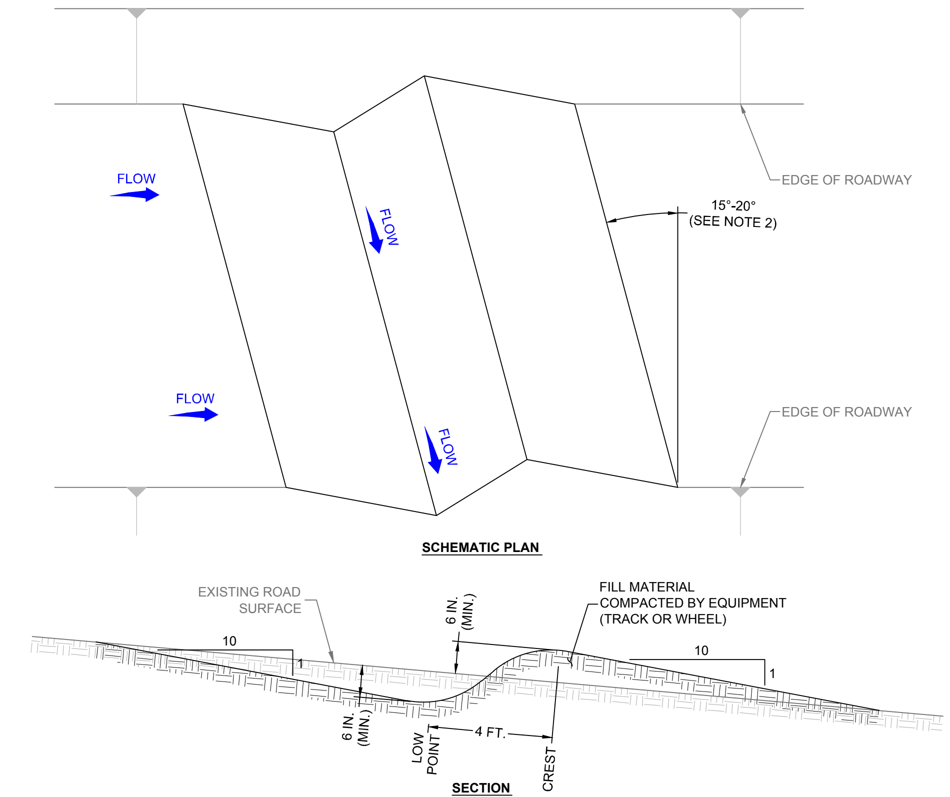


DRAINAGE SWALE TYPICAL SECTION

4 (520) NOT TO SCALE

NOTES - DRAINAGE SWALE:

1. WHERE VEHICLE CROSSING IS NECESSARY, INCREASE BOTTOM WIDTH AND/OR DECREASE SIDE SLOPES, AS APPROVED BY CONSTRUCTION MANAGER. PROVIDE EQUIVALENT FLOW CROSS SECTION TO THAT SHOWN ON THIS SHEET.

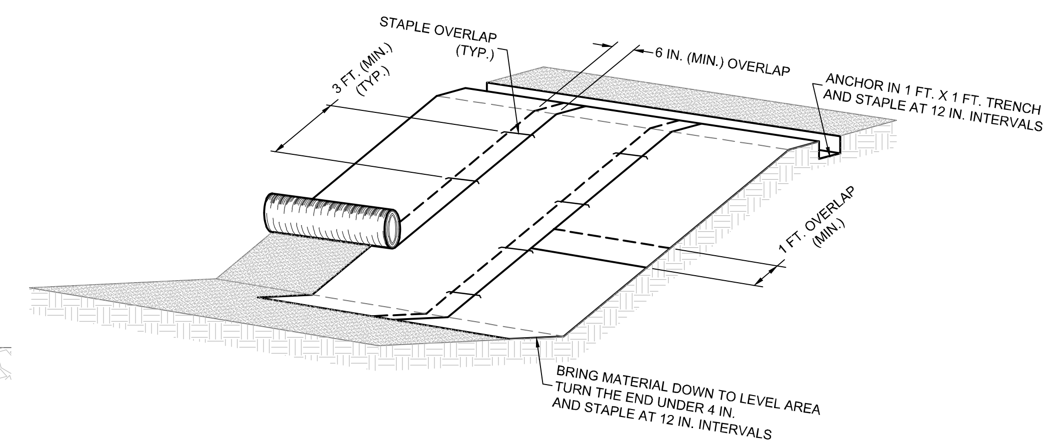


WATER BAR TYPICAL DETAIL

5 (520, 525) NOT TO SCALE

NOTES - WATER BAR:

1. CONSTRUCT WATER BARS AT INTERVALS OF 200 FEET ALONG ACCESS ROAD, OR AS DIRECTED BY THE CONSTRUCTION MANAGER.
2. ANGLE WATER BAR 15°-20°AS SHOWN TO DRAIN OVER EDGE OF SLOPE.



EROSION CONTROL MATTING TYPICAL DETAIL

6 (520, 525) NOT TO SCALE

NOTES - EROSION CONTROL MATTING:

1. SLOPE SURFACE SHALL BE SMOOTH BEFORE PLACEMENT TO PROVIDE PROPER SOIL CONTACT. DO NOT COMPACT SUBGRADE.
2. LIME, FERTILIZE, AND SEED BEFORE INSTALLATION.
3. PLACE MATS WITH SEAMS RUNNING UP AND DOWN, NOT ACROSS THE SLOPE. FOR SLOPES LESS THAN 4H:1V, MATS MAY BE PLACED ACROSS THE SLOPE.
4. DO NOT STRETCH MATS TIGHT; ALLOW THE MATS TO MOLD TO ANY IRREGULARITIES.
5. STAPLING PATTERN PER MANUFACTURER'S RECOMMENDATIONS. IF STAPLING DIFFICULT, SAND BAGS CAN BE USED AS AN ALTERNATIVE. CONTRACTOR CAN PROPOSE BAG SIZE DESIGN AND PLACEMENT TO THE CONSTRUCTION MANAGER FOR APPROVAL.
6. IF THERE IS A BERM AT THE TOP OF THE SLOPE, ANCHOR UPSLOPE OF THE BERM.

NOTES - GENERAL:

1. INSTALL SILT FENCE AND STRAW BALES AS SHOWN ON THE DRAWINGS AND DOWN SLOPE OF CONSTRUCTION ACTIVITIES AS REQUIRED TO PREVENT TRANSPORT OF SEDIMENT BEYOND THE CONSTRUCTION AREA, OR AS DIRECTED BY THE CONSTRUCTION MANAGER.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED BY THE CONTRACTOR ON A FREQUENT BASIS AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUOUS SATISFACTORY FUNCTIONING.
3. SEDIMENT SHALL BE REMOVED FROM SILT FENCES, STRAW BALE BARRIERS, AND OTHER SEDIMENT CONTROL FEATURES WHENEVER THE SEDIMENT REACHES 1/2 THE MAXIMUM POTENTIAL DEPTH.
4. FOR STRAW BALE OR SILT FENCE IN SLAG, USE METAL STAKES; FOR STRAW BALE OR SILT FENCE IN SOIL, USE WOOD STAKES.

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DRAFT
FOR FINAL REVIEW ONLY

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
4	[TBD]	FSS	ISSUED FOR FINAL DRAWING REVIEW	SES	JDW	
3	[TBD]	FSS	ISSUED FOR BID UPDATE	NED	JDW	
2	4-23-12	FSS	DRAFT INTERIM ACTION WORK PLAN	NED	JDW	
1	1-19-12	FSS	ISSUED FOR BID UPDATE	NED	JDW	
0	12-30-11	FSS	SITE MEETING	NED	JDW	

PROJECT
FORMER SATRALLOY SITE
STORMWATER POLLUTION PREVENTION PLAN

TITLE
EROSION AND SEDIMENT CONTROL DETAILS

PROJECT No. 053-1695.410		
REV. 4	SCALE	AS SHOWN
DESIGN	FSS	2-12-12
CADD	SES	11-12-12
CHECK	JDW	11-12-12
REVIEW		

SHEET
IAS-540

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APPENDIX D
CLEANING PROCEDURES

SECTION 02081
CLEANING PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

The CONTRACTOR shall furnish products and materials in order to clean various surfaces and structures. This section also applies to cleaning vehicles leaving the site. Personnel decontamination facilities and procedures are described in Section 02084 (Asbestos Abatement) of these Specifications. Management of water and solvents from cleaning or decontamination is addressed in Section 01600 (Waste Management).

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 GENERAL

A. Cleaning is intended to remove residues and accumulations from surfaces to achieve the conditions required for reuse, recycling, or disposal of the material being cleaned. Inclusion in this Specification of a cleaning method does not guarantee that the method will achieve environmental clearance and/or release. The CONTRACTOR shall be responsible for identifying and implementing methods that provide adequate cleaning.

B. Where different options are described for cleaning specific items, the CONTRACTOR may use discretion in determining the most appropriate methods, subject to approval in advance of the work.

C. The CONTRACTOR shall be responsible for all worker safety monitoring and industrial hygiene sampling during the cleaning efforts.

D. “Hard Materials” as used in these Specifications shall refer to reinforced or non-reinforced concrete, asphalt, brick, concrete block, concrete masonry units, tile, stone, metal piping and other metal, and other materials defined in Ohio Administrative Code 3745-400-05.

3.2 VERIFICATION OF CLEANUP

When cleaning has been completed, the CONTRACTOR shall notify the CONSTRUCTION MANAGER, who will perform inspection and/or testing as specified herein to verify cleanup. The CONTRACTOR shall not proceed with demolition in an area until the CONSTRUCTION MANAGER has verified completion of cleanup and approved this in writing. The CONSTRUCTION MANAGER will take photographs of cleaned areas to document the cleanup.

3.3 DUST REMOVAL FROM HARD MATERIALS

A. The CONTRACTOR shall use dry physical methods, such as brushing, scraping and vacuuming, to remove visible dust and/or other residues. Protective floor sealant is not considered residue and will not be required to be removed from the concrete surfaces.

B. The CONTRACTOR shall scrub and vacuum fissures in concrete to remove visible dust and debris.

C. After dust removal is completed, the CONSTRUCTION MANAGER will visually inspect the Hard Material surfaces to identify visible signs of dust.

Note: After removal of regulated dust is complete, dismantling the concrete floors and steel structures will create dust. This dust will be considered non-impacted (i.e., does not contain contaminants of concern) and will not require an additional vacuuming (except to the extent required for dust control).

D. Cleaning and inspection shall be repeated as needed until the material is visibly clean as determined by the CONSTRUCTION MANAGER.

3.4 PCB REMOVAL FROM HARD MATERIALS

A. The CONTRACTOR shall identify oil-stained Hard Materials to the CONSTRUCTION MANAGER. The CONSTRUCTION MANAGER will perform wipe test of affected areas after the CONTRACTOR has completed dust cleanup (per Section 3.3 of this Specification) of the affected areas. The CONTRACTOR shall be responsible for providing timely notification to the CONSTRUCTION MANAGER; no cost claim for delay due to this testing will be allowed.

B. The CONSTRUCTION MANAGER will perform a wipe test in accordance with 40 CFR 761.123 and 761.130 and send the wipe sample to a certified laboratory for PCB analysis. A one-week turnaround will be requested for the analysis.

C. If the analytical results indicate PCBs are present in concentrations less than or equal to 10 µg/100 sq. cm, the concrete or steel will be considered clean of PCBs.

D. If the analytical results indicate PCBs are present in concentrations greater than 10 ug/100 sq. cm., the CONTRACTOR shall clean the affected surface using a double wash and rinse in accordance with the requirements of Section 3.10 of this Section 02081, and the CONSTRUCTION MANAGER will perform a second wipe test.

E. The CONTRACTOR shall dispose of Hard Material that does not pass the second wipe test off-site in accordance with 40 CFR 761 and all other applicable laws and regulations. In the case of concrete, the affected surface shall be scarified in accordance with Section 3.9 of this Specification to a depth of between 1/8" and 1/4" depth to remove the affected concrete. The CONSTRUCTION MANAGER will then perform a wipe test on the remaining surface. Additional scarification shall be performed as needed until the wipe test meets the cleanup criterion of 10 µg/100 sq. cm.

F. Any oil staining remaining after PCB cleaning shall be cleaned in accordance with Section 3.5 of this Specification.

G. The CONTRACTOR shall collect all cleaning solutions and rinsate and dispose of off-site in accordance with 40 CFR 761 and all other applicable laws and regulations.

3.5 OIL REMOVAL FROM HARD MATERIALS

A. The CONTRACTOR shall verify that oil on Hard Materials does not contain PCBs as specified in Section 3.4 of this Specification.

B. The CONTRACTOR shall remove obvious oils and residues using appropriate method(s) (e.g., scraping and/or rinsing) until no visible evidence of oil is present.

C. The CONTRACTOR may elect to cut out the oil-stained section of the material and dispose off-site instead of cleaning if cleaning is not cost-effective.

D. The CONTRACTOR shall collect all cleaning solutions and rinsate and dispose of off-site in accordance all applicable laws and regulations.

3.6 DUST REMOVAL FROM TRANSITE

A. The CONTRACTOR shall vacuum dust from transite surfaces to the extent required for dust control.

B. Contractor to collect all dust into bags and mark the location of the area where the dust was collected on the outside of the bag. The location of where the marked bag is placed in the staging area shall also be recorded.

3.7 DRY VACUUM METHOD

A. This method will be used for removal of chromium-containing dust from concrete, steel, and other surfaces, and may also be used for collection of other materials at the discretion of the CONTRACTOR.

B. An industrial vacuum cleaner with a High Efficiency Particle Absorbing (HEPA) Filter shall be used to collect all loose debris, paint chips, or other accumulated material designated for this method.

C. Joints and connection points in the vacuum system hoses, canisters, filter boxes, and other components shall at all times be tight and functional to prevent the escape of dust. If abatement personnel, CONSTRUCTION MANAGER, inspector, or other party observes dust escaping, the vacuum shall be turned off immediately and the leak repaired before using the vacuum again.

D. If accumulated debris is not effectively removed by the nozzle velocity, then additional physical action such as brushing shall be applied to loosen the material and allow removal.

E. The vacuum collection container shall be lined with a suitable plastic bag to provide for easy removal from the vacuum and storage prior to final disposition.

F. For chromium-containing dust, Contractor shall mark each dust bag with information as to the specific area the dust was collected and give this bag a unique identification. Contractor shall provide CONSTRUCTION MANAGER with a map showing where each bag is located in the dust staging area and a table or map detailing the source location of each bag.

F. All material or debris that is collected as a result of this method shall be collected and stored in appropriate containers. If the material is intended for off-site disposal, it shall be segregated for waste characterization.

G. If the vacuum equipment has been used for collection of a known or suspected hazardous waste, then the vacuum components, including the nozzle, hose, collection container and filter, and any brush used, shall be cleaned before being used for non-hazardous materials or other categories of hazardous waste, or disposed in an appropriate manner.

3.8 HIGH PRESSURE WATER AND STEAM WASHING

A. Cleaning with water may be used by CONTRACTOR when necessary to achieve the cleaning requirements of this Specification (e.g., oil removal). It is not required for removal of chromium-containing dust.

B. High pressure water and steam cleaning entails the use of high pressure water and/or steam to physically remove oil, grease, dirt, loose paint, water soluble residuals, and other materials from surfaces.

C. All rinsate used for the washing action shall be controlled and collected to prevent the transfer of residuals from the surface being cleaned to another surface or material or to the environment. Rinsate shall not be allowed to infiltrate into the ground or to enter the surface water drainage system or any underground liquid conveyance structure. Extreme care shall be used during cleaning to capture all rinsate fluids. Describe rinsate collection and control methods in the CONTRACTOR'S Spill Control Plan.

D. Access to areas that will be cleaned using this method shall be restricted to the cleaning workers or the CONSTRUCTION MANAGER until cleaning has been completed.

E. After washing, walls, columns, or any overhead areas shall be dried using either natural ventilation or a blower.

3.9 SOLVENT WASH METHOD FOR PCB REMOVAL

A. This method may be used for cleaning impervious surfaces that are impacted with PCBs and regulated under 40 CFR 761. This method uses a double wash/rinse procedure in accordance with 40 CFR 761 Subpart S.

B. CONTRACTOR shall adhere to the equipment and material requirements specified in this Section and the requirements of 40 CFR 761.125, including use of water, solvents, scrubbers, absorbent pads, and other materials stated therein.

C. CONTRACTOR shall capture and contain all solvents and cleaners for reuse or disposal as necessary.

D. CONTRACTOR shall use the following procedure for solvent washing:

1. First Wash: Cover the designated area with an appropriate cleaning solution, such as concentrated detergent or non-ionic surfactant. Scrub rough surfaces with a scrub brush or scrubbing pad, adding cleaning solution so that the surface is always wet. Each square foot shall be washed for 1 minute. Wipe smooth surfaces with a cleaning solution-soaked disposable absorbent pad such that each square foot is wiped for 1 minute. Mop up or absorb the residual cleaner solution and suds with a clean disposable absorbent pad until the surface appears dry.

2. First Rinse: Rinse off the wash solution with clean water and capture the rinse water. Mop up the wet surface with a clean, disposable, absorbent pad until the surface appears dry.

3. Second Wash: Cover the entire surface with organic solvent in which PCBs are soluble to at least 5% by weight. Scrub rough surfaces with a scrub brush or disposable scrubbing pad and solvent so that each square foot of the surface is wet. Wipe smooth surfaces with a solvent-soaked, disposable absorbent pad so that each square foot is wiped for 1 minute. Wipe, mop, and/or sorb the solvent onto absorbent material until no visible traces of the solvent remain.

4. Second Rinse: Wet the surface with clean rinse solvent so that the entire surface is wet for 1 minute. Drain and contain the solvent from the surface. Wipe the residual solvent off the drained surface using a clean, disposable absorbent pad until no liquid is visible on the surface.

3.10 SCARIFICATION (DRY REMOVAL METHOD)

A. Scarification may be used by CONTRACTOR instead of water washing per Section 3.8 or solvent washing per Section 3.9 to remove oil- or PCB-impacted surface material from a surface requiring cleaning.

B Dry removal is the destructive removal of all or a portion of the impacted or regulated building material by physical methods such as chipping or scarifying. The objective of this process is to remove only the impacted surface as a method of reducing the volume of materials to be managed.

C. Dry removal shall be conducted in a manner that does not create uncontrolled release of dust in violation of applicable State and/or local air quality requirements.

D. Material removed by scarification shall be collected, characterized, and disposed in accordance with applicable regulations.

PART 4 – MEASUREMENT AND PAYMENT

A. Payment for removal, handling, and disposal of PCB-containing oil shall be per gallon of such oil disposed as measured in the field by the CONSTRUCTION MANAGER using the unit cost price in the BID.

B. Payment for removal, handling, and disposal of oil not containing PCBs shall be per gallon of such oil disposed as measured in the field by the CONSTRUCTION MANAGER using the unit cost price in the BID.

C. Payment for cleaning of PCB-contaminated concrete shall be per square foot of such concrete as measured in the field by the CONSTRUCTION MANAGER using the unit cost price in the BID.

D. Payment for removal, handling, and disposal of PCB-contaminated concrete that has failed a second wipe test as described in Section 3.4(E) (PCB Removal from Hard Materials) shall be per square foot of such concrete as measured in the field by the CONSTRUCTION MANAGER using the unit cost price in the BID.

E. Payment for cleaning and/or disposal of oil-stained concrete not contaminated by PCBs shall be included in the fixed price (lump sum) payment provided in the BID.

F. Payment for all other work required under this section shall be included in the fixed price (lump sum) payment provided in the BID.

END OF SECTION

APPENDIX E
CONCRETE CLEANING TEST REPORT

Golder Associates

TECHNICAL MEMORANDUM

Date:	November 15, 2012	**Project No.:**	053-1695
To:	Barbara K. Nielsen	**Company:**	Cyprus Amax Minerals Company
From:	Lee Holder		
cc:		**Email:**	Barbara_Nielsen@FMI.com
RE:	**REPORT ON CONCRETE TEST CLEANING**		

1.0 INTRODUCTION

On behalf of Cyprus Amax Minerals Company (Cyprus), test cleaning was performed on concrete surfaces at the Former Satralloy Site in Jefferson County, Ohio (the Site). This report describes the cleaning techniques evaluated, sampling procedures, and laboratory analytical results.

The cleaning test procedure (Attachment 1) was submitted to the Ohio Environmental Protection Agency (OEPA) for review prior to conducting the fieldwork and approved by OEPA via email from Mike Sherron on October 26, 2011.

The concrete test cleaning was conducted at the Site from November 29 to December 1, 2011. Fieldwork was completed by Golder Associates Inc. (Golder) personnel and Soren Suver. Mike Sherron of OEPA observed fieldwork and sampling on November 30, 2011.

2.0 PURPOSE AND SCOPE

The purpose of the test cleaning was to:

- Evaluate the effectiveness of different cleaning methods.
- Determine the extent of cleaning necessary for concrete use as "clean hard fill" in compliance with OAC 3745-400-05.

To meet the objectives, the study:

- Evaluated dry and wet cleaning methods for various surfaces.
- Determine chromium concentrations on surfaces before and after cleaning.
- Evaluated the effectiveness of cleaning methods using the Synthetic Precipitation Leaching Procedure (SPLP) for total chromium.
- Evaluated concrete materials using the Toxicity Characteristic Leaching Procedure (TCLP) for RCRA Metals.

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3.0 CONCRETE SURFACE SELECTION FOR TEST CLEANING

A set of concrete surfaces were selected at the Site for test cleaning, as summarized in Table 1. The areas were selected to represent the variety of concrete materials on the Site, provide sufficient surface area for the test cleaning, and to represent the range of cleaning effort that may be required. Three categories of surfaces were included in the testing:

- **Concrete foundation piers** – Reinforced concrete foundation piers under the baghouses were selected since they are exposed to exterior dust accumulation. Each pier has an 18" x 18" foot print with approximately 24" of pier above grade. The piers along the far eastern line of the baghouses (i.e. foundations closest to the Mill Buildings) were selected for evaluation.
- **Concrete slabs** – Dust is accumulated on the Mill Building concrete floors. Poured concrete floors were selected in each building where dust is accumulated and the surfaces are relatively smooth to obtain wipe samples. Areas selected include floor surfaces on the second and third floor of each building.
- **Concrete masonry units (CMU)** – CMU in walls had less dust accumulated on the surfaces, but is more porous than poured concrete. CMU walls were identified adjacent to concrete slabs with accumulations of dust. Loose CMUs lying in dust were also selected.

4.0 TEST CLEANING METHODS AND SAMPLING

Various dry and wet cleaning methods were evaluated during the study. A description of the cleaning and sampling protocol is provided in Attachment 1. Photographs of test cleaning are provided in Attachment 2.

4.1 Cleaning Procedures and Sampling

4.1.1 Foundation Piers

The test plan identified the south, east and north face of each foundation to be used for the pilot study. Wipe surface samples and concrete samples were collected prior to cleaning for comparison. Wipe and concrete samples were also collected after each of the following three cleaning methods.

- Hand brushing
- Vacuuming
- Vacuuming followed by a wet hand-brush wash

Each cleaning method was completed on separate faces of the pier.

Wipe surface samples for total and hexavalent chromium were planned prior to cleaning and following each cleaning method. Weathering of the exposed concrete surfaces rendered the surfaces too rough for the hexavalent chromium wipe sample media to remain intact for proper sampling, therefore; the hexavalent chromium wipe samples were omitted for the piers.

The weathered concrete piers have deteriorated such that drilling directly through a pier caused significant concrete spackling and further pier deterioration. Because the piers are load bearing, to avoid structural damage the testing locations were moved to adjacent non-load-bearing concrete surfaces within 10 feet of the selected piers (exposed to the same environmental conditions).

The test cleaning continued on the foundation piers followed by the collection of wipe samples for total chromium. A sample of concrete before cleaning was collected by removing a piece of the deteriorated concrete that had already separated from the pier. Concrete samples collected beneath Baghouse #1 and #2 were labeled "A #" to indicate the sample was collected from the adjacent slab rather than the actual pier. The samples of concrete before cleaning were labeled 1A and 5A.

The selected piers located beneath Baghouse #3 located at the South Mill Building were surrounded by standing water at the time of the pilot study, and were in a similar deteriorated state. A large non-load bearing concrete foundation located on the far eastern line of the baghouse was selected for test cleaning and sampling in lieu of the foundation piers. Because test cleaning and sampling was completed at the same location, samples were labeled with only the pre-assigned location number.

4.1.2 Concrete Slabs

The test plan identified concrete floors on the second and third floors of each building. Because of the thick accumulation of dust, and considering that proposed interim actions include at least minimal sweeping and/or vacuuming, samples before cleaning were not collected. Wipe surface samples and concrete samples were collected following each of three cleaning methods:

- Minimal sweeping
- Vacuuming
- Vacuuming followed by a power wash and drying

Each cleaning method was completed sequentially on a pre-selected area of the slab, with distinct portions marked for each round of sampling. The designated area was swept first followed by sampling. The designated area was then vacuumed and sampled. The designated area was then re-vacuumed and pressured wash followed by sampling.

4.1.3 Concrete Masonry Units

Two categories of CMU were evaluated during the pilot study: loose CMU and CMU walls. Surface wipe sampling was not planned due to the rough surfaces. Concrete samples were obtained from each CMU.

Loose CMU blocks were selected from each building that were lying in dust. Concrete samples were collected following each of three cleaning methods:

- Shaking
- Dry hand brushing
- Vacuuming

Each cleaning method was evaluated separately on individual CMU blocks (i.e., the cleaning methods were not completed in sequentially).

Concrete samples were collected from CMU walls prior to cleaning and following each of three proposed cleaning techniques:

- Dry Hand Brushing
- Vacuuming
- Vacuuming followed by power washing and drying

Each cleaning method was completed sequentially on a pre-selected area of the CMU wall, with distinct portions marked for each round of sampling. The designated area was dry hand brushed first followed by sampling. The designated area was then vacuumed and sampled. The designated area was then re-vacuumed and pressured wash followed by sampling.

4.2 Cleaning Methods

Dry hand brushing and minimal sweeping was completed using standard nylon tire brushes and push brooms. Loose CMUs were shaken over the area where they were retrieved.

Vacuuming was accomplished using standard 6 hp shop vacuum with a HEPA exhaust filter and a nozzle with a nylon brush attachment to dislodge all visible evidence of dust on the surfaces.

Hand washing of foundation piers and concrete slabs beneath the baghouses was accomplished by wet brushing with a standard tire brush, using water collected and prepared from Cross Creek. Waste water generated during wet hand washing was collected on plastic sheeting placed beneath the cleaning surfaces.

Pressure washing of concrete slabs and CMU walls was accomplished by using a gasoline powered 3,000 psi pressure washer. Waste water generated during pressure washing was collected on plastic sheeting placed around the perimeter of the concrete slab cleaning area or beneath the CMU wall.

4.3 Wash Water

Approximately 20 gallons of water from Cross Creek was collected and filtered for hand washing and pressure washing prior to test cleaning. A composite sample of the filtered water was collected and analyzed for total chromium and iron prior to use as cleaning water.

Residual wash water was collected from the plastic sheeting following wet cleaning of each concrete slab and CMU wall, and placed into separate containers: one for foundation pier hand wash water, and one for concrete slab pressure wash water. A composite sample of each category of wash water was collected and analyzed for total chromium, hexavalent chromium and total suspended solids upon the conclusion of test cleaning activities.

4.4 Sample Collection and Analysis

Wipe surface samples were collected to evaluate cleaning effectiveness of the concrete piers and concrete slabs. Concrete samples were collected from all concrete surfaces. Samples were labeled according to the pre-determined location numbers listed in Table 1.

4.4.1 Wipe Samples

Wipe samples were collected from foundation piers prior to cleaning, and from concrete slabs following the minimal sweeping included in the IA work plan. The sampling plan included collecting samples for total chromium and hexavalent chromium from each surface. However, exterior concrete surfaces beneath the baghouses were too rough for the wipe hexavalent chromium sample media to remain intact for proper sample collection. Wipe samples were not collected from CMU because the rough surfaces would tear the wipe material.

A disposable 100 cm^2 cardstock sample grid was placed over the designated sampling area. Total chromium wipe samples were collected using one-half of a standard (15 cm x 15 cm) pre-preserved Ghost Wipe. Hexavalent chromium wipe samples were collected using a 37 mm diameter unpreserved binderless quartz filter. All sample media was provided by the laboratory.

Each wipe sample was obtained following a standard wipe procedure:

- The first pattern uses an “S” strokes, covering the entire surface
- Fold the exposed side of the wipe inward
- Wipe the same area with “S” strokes, starting at right angles to the first wipe pattern
- Fold the exposed side of the wipe inward
- Again wipe the area with “S” strokes, following the initial pattern
- Place the wipe in the dedicated sample container

Each wipe was placed into a laboratory-supplied plastic vial, labeled, and inventoried on the chain-of-custody form. The wipe samples were transported by commercial courier and analyzed by ALS Environmental, for total chromium (USEPA test method 6010A) and for hexavalent chromium (OSHA test method W7001).

4.4.2 Concrete Samples

Samples from most exterior concrete locations and from all concrete slabs were collected by drilling through the concrete using a one-inch-diameter masonry auger bit driven by a hand-held hammer drill. Disposal card stock was placed beneath each vertical drilling point, or on the surface of each concrete slab, to collect drill cuttings. The auger bit was advanced approximately 3-inchs in five to six locations for each sample until an adequate sample volume of cuttings was obtained. All cuttings were placed into laboratory-supplied glassware and labeled. Due to the fine size of the drill cuttings, no additional laboratory preparation of the sample material was required.

Samples from CMU walls were collected using a masonry hammer or grinder with a masonry cutting wheel. Chipped and cut pieces of CMU, along with all fines generated during removal, were collected in plastic containers as material was removed from the wall until an adequate sample volume was collected. All of the material was placed in a re-sealable plastic bag, double-bagged, and labeled. Additional sample preparation was completed at the laboratory.

Samples from loose CMU were collected in the field by placing the CMU over dedicated plastic sheeting and breaking the CMU into small fragments using a masonry hammer. The fragments and all fine material generated on the plastic sheeting were collected and placed into a re-sealable plastic bag, double-bagged, and labeled.

Two concrete pier samples (Samples #1 and #5) were collected from the top surface of baghouse piers. Weathering and deterioration of the piers enabled collecting fragments of the top of each pier prior to cleaning. The fragments were placed on dedicated plastic sheeting and broken into smaller fragments using a masonry hammer. The fragments and all fine material generated on the plastic sheeting were collected and placed into a re-sealable plastic bag, double-bagged, and labeled.

Each concrete was labeled and inventoried on the chain-of-custody form. The concrete samples were transported by commercial courier and analyzed by Test America, Inc. for total chromium by SPLP following USEPA test method 1312/6020. In addition, Test America analyzed the pre-cleaned or minimally cleaned concrete samples for RCRA Metals by TCLP following USEPA test method 1311/6020/7470.

4.4.3 CMU Sample Preparation

Test America Inc. pulverized CMU concrete samples and sample nos. 1A and 5A collected from the top of the baghouse piers. Test America completed the additional size reduction by performing the following:

- Samples that required additional crushing to meet TCLP particle size requirements of less than 1 cm were manually pulverized by wrapping the material in several layers of butcher paper and crushing the material with a large hammer.
- To meet TCLP/SPLP particle size requirements, the sample was screened using a 1 cm sieve. Any material greater than 1 cm was transferred to butcher paper and crushed using a hammer, and then rescreened using the 1 cm sieve. Successive reductions and screenings were completed until all of the material for a particular sample was reduced as required. All samples were retained and returned to the original sample containers.

5.0 RESULTS AND CONCLUSIONS

Analytical results are provided in Table 1.

RCRA metals were not detected above TCLP hazardous waste limits in any of the concrete samples, either before or after cleaning.

Wipe test results indicate that wet cleaning generally (but not always) removed more chromium dust than dry cleaning. However, the SPLP simulates rain falling on a surface, and therefore is much more relevant than wipe testing for evaluating the potential differences in environmental impacts for the different cleaning methods. The SPLP results for wet and dry cleaning methods were not significantly different. Therefore, it is concluded that wet cleaning would offer no environmental benefit over dry cleaning, and dry cleaning is sufficient for concrete use as “clean hard fill” in compliance with OAC 3745-400-05.

List of Attachments

Table 1	Summary of Hard Surface Test Cleaning
Attachment 1	Test Cleaning of Concrete
Attachment 2	Concrete Test Cleaning Photographs

TABLE

Table 1: Summary of Hard Surface Test Cleaning, Former Satralloy Site

Sample Number	General Location	Specific Location	Surface Cleaned	Method of Cleaning	Wipe - Total Cr ug/100 cm2	Wipe - Cr+6 ug/100 cm2	SPLP - Total Cr mg/L	TCLP - Total Cr mg/L
North Mill Building and Baghouse								
1	Bag House #2	foundation pier	RC pier fdn	None	95	-	(1A-crushed) 0.26	(1A) 0.59
2	Bag House #2	foundation pier & slab	RC pier & slab fdn	Brush	140	-	(A2-drilled) 0.013	-
3	Bag House #2	foundation pier & slab	RC pier & slab fdn	Vacuum	160	-	(A3-drilled) 0.0047	-
4	Bag House #2	foundation pier & slab	RC pier & slab fdn	Vac & HW	73	-	(A4-drilled) 0.011	-
5	Bag House #1	foundation pier	RC pier fdn	None	2.6	-	(5A-crushed) 0.38	(5A) 0.63
6	Bag House #1	foundation pier & slab	RC pier & slab fdn	Brush	4.8	-	(A6-drilled) 0.009	-
7	Bag House #1	foundation pier & slab	RC pier & slab fdn	Vacuum	3	-	(A7-drilled) 0.01	-
8	Bag House #1	foundation pier & slab	RC pier & slab fdn	Vac & HW	5.5	-	(A8-drilled) 0.015	-
9	Second Floor	North sector	Concrete slab	Minimal sweep	780	0.44	0.0065	0.0034
10	Second Floor	North sector	Concrete slab	Vacuum	370	0.062	0.0063	-
11	Second Floor	North sector	Concrete slab	Vac & PW	93	0.078	0.0074	-
12	Third Floor	North sector	Concrete slab	Minimal sweep	170	NA	0.005	0.0034
13	Third Floor	North sector	Concrete slab	Vacuum	34	0.11	0.0051	-
14	Third Floor	North sector	Concrete slab	Vac & PW	9.5	<0.05	0.0049	-
15	Third Floor	North sector	CMU loose	Shake	-	-	0.0024	<0.02
16	Third Floor	North sector	CMU loose	Brush	-	-	<0.002	-
17	Third Floor	North sector	CMU loose	Vacuum	-	-	0.002	-
18	Second Floor	North sector	CMU wall	No clean	-	-	<0.002	<0.02
19	Second Floor	North sector	CMU wall	Brush	-	-	0.002	-
20	Second Floor	North sector	CMU wall	Vacuum	-	-	0.0083	-
21	Second Floor	North sector	CMU wall	Vac & PW	-	-	0.0022	-
22	Third Floor	North sector	CMU wall	No clean	-	-	<0.002	<0.02
23	Third Floor	North sector	CMU wall	Brush	-	-	0.0029	-
24	Third Floor	North sector	CMU wall	Vacuum	-	-	<0.002	-
25	Third Floor	North sector	CMU wall	Vac & PW	-	-	0.002	-
26	Ground Floor	Floor soils area	CMU loose	Shake	-	-	3.1	1.5
27	Ground Floor	Floor soils area	CMU loose	Brush	-	-	0.13	-
28	Ground Floor	Floor soils area	CMU loose	Vacuum	-	-	1.1	-

Notes:

RC=Reinforced Concrete
Vac= Vacuum w/ brush attachment
CMU= Concrete Masonary Unit (Cinder Block)
PW= Pressure wash with mist spray
fdn= foundation
HW= Hand wash

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Table 1: Summary of Hard Surface Test Cleaning, Former Satralloy Site

Sample Number	General Location	Specific Location	Surface Cleaned	Method of Cleaning	Wipe - Total Cr ug/100 cm2	Wipe - Cr+6 ug/100 cm2	SPLP - Total Cr mg/L	TCLP - Total Cr mg/L
South Mill Building and Baghouse								
29	Bag House #3	foundation slab	RC slab fdn	None	7.2	-	0.0023	<0.002
30	Bag House #3	foundation slab	RC slab fdn	Brush	8.4	-	0.0026	-
31	Bag House #3	foundation slab	RC slab fdn	Vacuum	6.7	-	0.0024	-
32	Bag House #3	foundation slab	RC slab fdn	Vac & HW	9.9	-	<0.002	-
33	Third Floor	North sector	Concrete slab	Minimal sweep	190	0.18	0.0053	0.0034
34	Third Floor	North sector	Concrete slab	Vacuum	11	0.44	0.0037	-
35	Third Floor	North sector	Concrete slab	Vac & PW	11	0.05	0.0046	-
36	Second Floor	North sector	Concrete slab	Minimal sweep	1300	0.31	0.0047	0.0046
37	Second Floor	North sector	Concrete slab	Vacuum	240	0.14	0.0046	-
38	Second Floor	North sector	Concrete slab	Vac & PW	80	<0.05	0.0055	-
39	Fourth Floor	North sector	CMU loose	Shake	-	-	<0.002	<0.02
40	Penthouse Deck	North sector	CMU loose	Brush	-	-	<0.002	-
41	Penthouse Deck	North sector	CMU loose	Vacuum	-	-	<0.002	-
42	Third Floor	North sector	CMU wall	No clean	-	-	0.0054	<0.02
43	Third Floor	North sector	CMU wall	Brush	-	-	0.0061	-
44	Third Floor	North sector	CMU wall	Vacuum	-	-	0.0043	-
45	Third Floor	North sector	CMU wall	Vac & PW	-	-	0.0068	-
46	Ground Floor	Floor soils area	CMU loose	Shake	-	-	0.0024	<0.02
47	Ground Floor	Floor soils area	CMU loose	Brush	-	-	0.0037	-
48	Ground Floor	Floor soils area	CMU loose	Vacuum	-	-	0.0035	-

Water Samples		Total Cr mg/L	Dissolved Cr mg/L	Total Fe mg/L	Cr+6 mg/L	TSS mg/L
CW	Cross Creek water after filtering	<0.002	-	0.56	-	-
PWW	Pressure Wash waste water	1.4	-	-	<0.2	740
HBW	Hand Brush Wash waste water	5.4	0.0051	-	<1.0	3500

Notes:

RC=Reinforced Concrete
Vac= Vacuum w/ brush attachment
CMU= Concrete Masonary Unit (Cinder Block)
PW= Pressure wash with mist spray
fdn= foundation
HW= Hand wash

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ATTACHMENT 1
TEST CLEANING OF CONCRETE

Test Cleaning of Concrete
Former Satralloy Site
17 November 2011

Location: Satralloy Site
4243 County Road 74
Mingo Junction, OH 43938

PURPOSE

The purpose of the test will be to determine the effectiveness of different methods of dry and wet cleaning of concrete. The objective of the cleaning will be to make the concrete suitable for use as “clean hard fill” as defined at OAC 3745-400-001 and regulated under OAC 3745-400-005.

TESTING SCOPE

A set of concrete surfaces with smooth surfaces and a set of concrete masonry unit (CMU) surfaces have been selected at the Satralloy Site for test cleaning, as detailed in the attached table. The areas were selected to represent the variety of concrete materials on the Site, provide sufficient surface area for the test cleaning, and to represent the full range of cleaning effort that may be required. The attached table specifies the test cleaning and associated verification sampling and analysis to be performed in conjunction with the procedure text.

SAMPLING AND ANALYSIS

All samples are to be collected, preserved, labeled, and packaged following chain-of-custody procedure. Sample containers will be obtained from the laboratory with the appropriate preservatives for the analyses.

SPLP and TCLP Sampling and Analysis

The Synthetic Precipitation Leaching Procedure (SPLP) test will be used to evaluate the effectiveness of cleaning concrete. The SPLP leachate will be analyzed for total chromium.

Selected samples (see attached table) will also be tested using the Toxic Characteristic Leaching Procedure (TCLP). TCLP leachate samples will be analyzed for RCRA metals.

Sampling procedure for smooth concrete:

- Collect samples for SPLP and TCLP analysis using a one-inch-diameter masonry auger bit driven by a hand-held hammer drill.
- Collect at least 400 grams for each sample location (SPLP plus option for TCLP).
- For concrete floors, drill one-inch diameter holes approximately 2 inches deep into the concrete within the $100cm^2$ test area.
- For foundation piers, holes may be limited to a depth of one inch to avoid impairing the structural integrity of the pier.
- Collect all of the augur cuttings and place in the sample container.

Sampling procedure for concrete masonry:

- Collect samples for SPLP and TCLP analysis using a masonry hammer or grinder with a masonry cutting wheel.
- Collect at least 200 grams (approx. area 4”x2”) from the concrete block where the block has a hollow space (i.e., thickness approx. 1”).
- Place all of the cut or chipped sample pieces in the sample jar supplied by the laboratory.

Test Cleaning of Concrete
Former Satralloy Site
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Wipe Tests

For smooth surfaces, wipe tests will be used to supplement SPLP testing to determine the effectiveness of cleaning. For each wipe test, two wipe samples will be obtained: one for total chromium analysis (EPA Method 6020), and one for hexavalent chromium analysis (OSHA Method W4001).

- For total chromium analysis, use Ghost Wipes or equivalent.
- For hexavalent chromium analysis, use binderless quartz fiber wipes.
  - PVC filter wipes are also suitable in general for hexavalent chromium, but could tear on rough concrete.
  - OSHA reports that other wipes can reduce Cr+6 to Cr+3.
- Chrome-plating environments require a special preservative to eliminate interference from chrome-plating acid, which does not apply here.
- Filter size and preservative shall be:
  - Ghost Wipes: 15 cm x 15 cm, torn in half for each 100 cm^2 sample, pre-moistened in package.
  - Binderless quartz filters: 37 mm diameter, unpreserved.
- Mark the portions of the test area to be wiped.
- Wipe a 100 cm^2 portion of the test area and place the wipe in a container for total chromium analysis.
- Wipe a non-overlapping adjacent 100 cm^2 portion of the test area and place the wipe in a container for hexavalent chromium analysis.
- Wiping action:
  - Do a first wipe using “S” strokes, covering the entire surface.
  - Fold the exposed side of the wipe inward
  - Wipe the same area with “S” strokes, starting a right angles to the first wipe pattern
  - Fold the exposed side of the wipe inward
  - Again wipe the area with “S” strokes, following the initial pattern
  - Place the wipe in the sample container.

Cleaning Water

Water from Cross Creek will be used for hand washing and pressure washing of the concrete. Collect water from Cross Creek from a location between 200 and 250 feet downstream of the former water treatment plant. Collect the water in clean 5-gallon buckets and then pour it through a 5 micron filter into another clean 5-gallon bucket to remove solids. Send a sample of the filtered water to the laboratory and analyze for total chromium and iron (the iron analysis is because iron can reduce hexavalent chromium to the trivalent form).

Collect residual washwater in buckets with lids and store in a secure location in one of the mill buildings pending disposition after receipt of analytical results. Collect water from hand washing and pressure washing in separate containers.

Composite water from cleaning into two samples: one from hand washing, and one from pressure washing. These samples will be analyzed for total chromium, hexavalent chromium, and total suspended solids (TSS).

Test Cleaning of Concrete
Former Satralloy Site
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FIELD MATERIALS

- PPE as required by the Site Health and Safety Plan (HASP)
- Small hand brushes for sweeping dust off area to be tested
- 1” x 3” poly bristle brushes with plastic backing for hand-wash tests
- 6 hp shop vacuum with HEPA filter and HEPA dry bags
- Brush nozzle attachments for shop vacuum
- Pressure washer
- 5-gallon buckets for water supply for brush cleaning and feed tank for pressure washer
- 4 mil plastic sheeting
- Squeegee
- Steel rake
- Duct tape
- Clean weights to hold down plastic
- Cleaning gloves
- Water from Cross Creek (for cleaning)
- 5-micron filter for Cross Creek water
- Deionized water (for wipe tests)
- Sample wipes and sample containers
- Sampling templates
- Sample bottles from laboratory
- Chain-of-custody forms
- Roto Drill and 1-inch concrete bit
- Grinder/Cutter with 7-inch Diamond Blades

CLEANING PROCEDURES

General

- Document the location of each test area by marking on a Site drawing and measuring the location relative to local reference points.
- Document the conditions of test areas before and after each cleaning procedure with photographs and field notes.
- Sample numbers are defined in the attached table.

Baghouse Foundation Pier Cleaning

Each foundation pier under the baghouses has an 18” x 18” foot print. The piers along the far eastern line of the bag houses (i.e. foundations closest to the Mill Buildings) will be used for the sample surfaces. For each foundation, the south, east and north face will be used as potential sample areas. The west face of the foundation often has less than 12 inches of vertical face exposed above the soil line and is not planned to be used as a sample area.

- Designate 4 separate test areas (each with two areas minimum 10 cm x 10 cm for two wipe tests):
  - No cleaning (upper portion of one face)
  - Brush clean (second face)
  - Vacuum (third face)
  - Vacuum and hand-wash (immediately beneath the no-cleaning sample area)
- Take wipe samples before any cleaning from the upper portion of one face.
- Clean in the designated test area with a brush (second face).

- Take wipe samples from the brush-cleaned area.
- Clean in the designated test area by vacuuming (third face).
- Take wipe samples from the vacuumed area.
- Clean in the designated test area by vacuuming and hand wash (beneath "no cleaning" sample area):
  - Use a steel rake to smooth area on ground in front and side of foundation.
  - Brush hard around the soil base of concrete foundation face to clean area for taping plastic to the pier.
  - Lay 4-mil plastic on the ground around the front and side of the pier.
  - Tape edge of plastic to base of foundation.
  - Set small weights to hold down rolled plastic edge coming out about 2 feet from foundation to collect water runoff.
  - Vacuum the pier face.
  - Use a small poly brush, dipping it in a dedicated wash bucket.
  - Carefully remove tape from foundation wall keeping all water on plastic and place plastic in separate empty 5-gallon bucket.
  - Take bucket to an area where there is good light and carefully unroll plastic, keeping washwater in the bucket.
  - Collect washwater for sampling and analysis as described elsewhere in this procedure.
  - Let the washed area air-dry.
- Take wipe samples from the washed area.
- Collect SPLP samples from each of the three cleaned surfaces:
  - Lay 4-mil plastic on the ground around beneath the face to be drilled.
  - Tape edge of plastic to base of foundation.
  - Use a dedicated disposable plastic container to collect cuttings from the drill hole.
  - Drill 1-inch diameter holes within the cleaned surface area.
  - Place cuttings into glassware supplied by the laboratory as drilling continues.
  - Upon completion of drilling, carefully remove tape from the foundation, keeping all residual drill cuttings entrapped on the plastic for transfer to the lab glassware.
  - Repeat the procedure for the two remaining faces.
  - Mark each area cleaned and sampled with marker paint.
- Due to the structural limitations, TCLP samples will be collected from an adjacent pier with visually similar dust accumulations. TCLP samples will be collected following the same procedure as for SPLP samples.

Concrete Slab Cleaning

- Mark the perimeter of the area for test cleaning.
- Designate 3 separate test areas (each with two areas minimum 10 cm x 10 cm for two wipe tests):
  - Minimal Sweeping
  - Vacuum
  - Vacuum and pressure-wash
- Gently sweep the entire test area (a light sweeping not intended to remove all dust on the slab).
- Take wipe samples representing minimal sweeping.
- Collect SPLP/TCLP sample by drilling one-inch diameter holes adjacent to the 100cm^2 wipe sample area. Both the total chrome wipe sample and hexavalent chrome wipe sample template locations may be used (200 cm^2 available for drilling).
- Clean in the designated test area by vacuuming.
- Take wipe samples from the vacuumed area.
- Repeat the SPLP/TCLP sample collection procedure within the wipe sample area as described above.

- Clean in the designated test area by vacuuming and pressure wash:
  - Cut a piece of plastic 12 feet by 12 feet with a center cut out area 24 inches by 24 inches.
  - Place weights around the plastic to hold it in place.
  - Vacuum out center open cut area with bristle attachment area two foot square until there is no dust visible on the slab.
  - Tape around edge of opening with duct tape to concrete floor.
  - Use the pressure washer to spray the vacuumed area with a light mist
  - Carefully roll up tarp keeping water trapped in plastic and place in empty 5-gallon bucket.
  - Collect washwater for sampling and analysis as described elsewhere in this procedure.
  - Let the washed area air-dry.
- Take wipe samples from the washed area
- Repeat the SPLP/TCLP sample collection procedure adjacent to the wipe sample area as described above.

CMU Wall Cleaning

- Mark an area for test cleaning on an existing CMU wall about 3 feet above the slab level
- Designate 4 separate sampling areas for:
  - No cleaning
  - Brush clean
  - Vacuum
  - Vacuum and pressure-wash
- Obtain a sample for SPLP and TCLP analysis (see procedure above) representing no cleaning.
- Clean in the designated test area with a brush.
- Obtain a sample for SPLP analysis representing brush cleaning.
- Clean in the designated test area by vacuuming.
- Obtain a sample for SPLP analysis representing vacuum cleaning.
- Clean in the designated test area by vacuuming and pressure wash:
  - Brush hard around the base of the wall to clean an area for taping plastic to the wall
  - Lay 4-mil plastic (10’ x 10’ size) on the ground around the front of the wall area to be cleaned.
  - Tape the edge of plastic to the base of the wall
  - Set small weights to hold down rolled plastic edge coming out about 8 feet from foundation to collect water runoff.
  - Vacuum the test area.
  - Use the pressure washer to spray the vacuumed area with a light mist.
  - Carefully remove tape from the wall, keeping all water on the plastic.
  - Place the plastic in an empty 5-gallon bucket.
  - Take bucket to an area where there is good light and carefully unroll plastic, keeping washwater in the bucket.
  - Collect washwater for sampling and analysis as described elsewhere in this procedure.
  - Let the washed area air-dry.
- Obtain a sample for SPLP analysis representing vacuum and pressure-wash cleaning.

Loose CMU Cleaning

- Select 3 pieces of loose CMU test cleaning:
  - Mild shaking
  - Dry brushing
  - Vacuum
- Locate a loose piece of Concrete Masonry Unit (CMU) that is lying in dust and partially and/or fully covered in dust.

Test Cleaning of Concrete
Former Satralloy Site
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- Pick up the CMU and perform a mild hand shaking to loosen the dust from the block.
- Obtain a sample for SPLP and TCLP analysis (see procedure above) representing this “shake” cleaning.
- Pick up another piece of CMU from the same area and perform a hand brushing to remove the visible dust from the block including bushing out the inside hollow core area.
- Obtain a sample for SPLP analysis representing this brush cleaning.
- Pick up another piece of CMU from the same area vacuum the block to remove all the visible dust from the block, including vacuuming out the inside hollow core area.
- Obtain a sample for SPLP analysis representing this vacuum cleaning.

Satralloy Site
Summary of Hard Surface Test Cleaning

RC=Reinforced Concrete
Vac= Vacuum w/ brush attachment
CMU= Concrete Masonary Unit (Cinder Block)

PW= Pressure wash with mist spray
fdn= foundation
HW= Hand wash

Sample Number	General Location	Specific Location	Surface Cleaned	Method of Cleaning	Wipe Test	SPLP Test	TCLP Test
North Mill Building and Baghouse							
1	Bag House #1	foundation pier	RC pier fdn	None	X		X
2	Bag House #1	foundation pier	RC pier fdn	Brush	X	X	
3	Bag House #1	foundation pier	RC pier fdn	Vacuum	X	X	
4	Bag House #1	foundation pier	RC pier fdn	Vac & HW	X	X	
5	Bag House #2	foundation pier	RC pier fdn	None	X		X
6	Bag House #2	foundation pier	RC pier fdn	Brush	X	X	
7	Bag House #2	foundation pier	RC pier fdn	Vacuum	X	X	
8	Bag House #2	foundation pier	RC pier fdn	Vac & HW	X	X	
9	Third Floor	North sector	Concrete slab	Minimal sweep	X	X	X
10	Third Floor	North sector	Concrete slab	Vacuum	X	X	
11	Third Floor	North sector	Concrete slab	Vac & PW	X	X	
12	Third Floor	South sector	Concrete slab	Minimal sweep	X	X	X
13	Third Floor	South sector	Concrete slab	Vacuum	X	X	
14	Third Floor	South sector	Concrete slab	Vac & PW	X	X	
15	Third Floor	North sector	CMU loose	Shake		X	X
16	Third Floor	North sector	CMU loose	Brush		X	
17	Third Floor	North sector	CMU loose	Vacuum		X	
18	Third Floor	North sector	CMU wall	No clean		X	X
19	Third Floor	North sector	CMU wall	Brush		X	
20	Third Floor	North sector	CMU wall	Vacuum		X	
21	Third Floor	North sector	CMU wall	Vac & PW		X	
22	Third Floor	South sector	CMU wall	No clean		X	X
23	Third Floor	South sector	CMU wall	Brush		X	
24	Third Floor	South sector	CMU wall	Vacuum		X	
25	Third Floor	South sector	CMU wall	Vac & PW		X	
26	Ground Floor	Floor soils area	CMU loose	Shake		X	X
27	Ground Floor	Floor soils area	CMU loose	Brush		X	
28	Ground Floor	Floor soils area	CMU loose	Vacuum		X	

Satralloy Site
Summary of Hard Surface Test Cleaning

RC=Reinforced Concrete
Vac= Vacuum w/ brush attachment
CMU= Concrete Masonary Unit (Cinder Block)

PW= Pressure wash with mist spray
fdn= foundation
HW= Hand wash

Sample Number	General Location	Specific Location	Surface Cleaned	Method of Cleaning	Wipe Test	SPLP Test	TCLP Test
South Mill Building and Baghouse							
29	Bag House #1	foundation pier	RC pier fdn	None	X		X
30	Bag House #1	foundation pier	RC pier fdn	Brush	X	X	
31	Bag House #1	foundation pier	RC pier fdn	Vacuum	X	X	
32	Bag House #1	foundation pier	RC pier fdn	Vac & HW	X	X	
33	Third Floor	North sector	Concrete slab	Minimal sweep	X	X	X
34	Third Floor	North sector	Concrete slab	Vacuum	X	X	
35	Third Floor	North sector	Concrete slab	Vac & PW	X	X	
36	Third Floor	South sector	Concrete slab	Minimal sweep	X	X	X
37	Third Floor	South sector	Concrete slab	Vacuum	X	X	
38	Third Floor	South sector	Concrete slab	Vac & PW	X	X	
39	Third Floor	North sector	CMU loose	Shake		X	X
40	Third Floor	North sector	CMU loose	Brush		X	
41	Third Floor	North sector	CMU loose	Vacuum		X	
42	Third Floor	North sector	CMU wall	No clean		X	X
43	Third Floor	North sector	CMU wall	Brush		X	
44	Third Floor	North sector	CMU wall	Vacuum		X	
45	Third Floor	North sector	CMU wall	Vac & PW		X	
46	Ground Floor	Floor soils area	CMU loose	Shake		X	X
47	Ground Floor	Floor soils area	CMU loose	Brush		X	
48	Ground Floor	Floor soils area	CMU loose	Vacuum		X	

ATTACHMENT 2
CONCRETE TEST CLEANING PHOTOGRAPHS

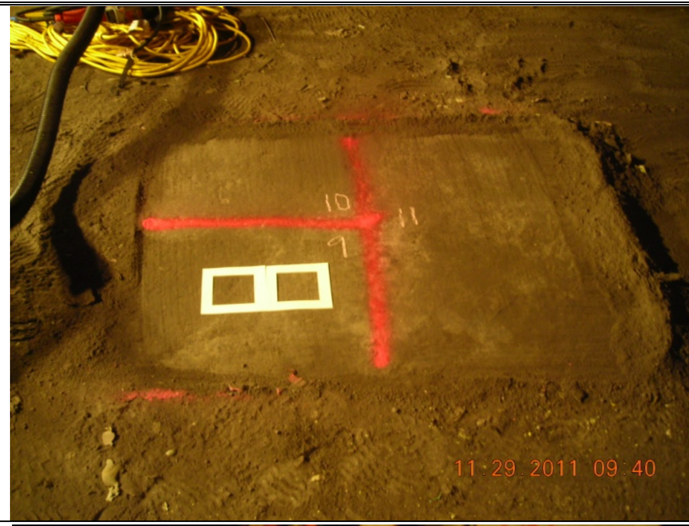
Concrete Test Cleaning	
PHOTOGRAPH 1 Foundation pier beneath Baghouse No. 2 prior to test cleaning. Test cleaning and wipe sampling location 3 is this face of the pier. Location 2 is on the right face, locations 1 and 4 on the left face. Note deteriorated concrete on top of pier.	
PHOTOGRAPH 2 Section of deteriorated concrete removed from foundation pier and labeled sample 1A. This procedure was repeated at sample location 5A beneath Baghouse No. 1 prior to test cleaning.	
PHOTOGRAPH 3 Wipe samples 1 and 4 were collected from this face of the pier. Due to excessive spackling while drilling, the cleaning procedure was repeated on the adjacent slab (background) and concrete samples A2-A4 were collected from the slab.	

Concrete Test Cleaning	
PHOTOGRAPH 4 Pier beneath Baghouse No. 1. Test cleaning was completed on the pier and the adjacent slab. Wipe samples and concrete sample 5A were collected from the pier. Concrete samples A6-A8 were collected from the slab.	
PHOTOGRAPH 5 Piers beneath Baghouse No. 3 were surrounded by standing water.	
PHOTOGRAPH 6 All test cleaning and sampling beneath Baghouse No. 3 was completed on the concrete foundation located adjacent to the piers.	

Concrete Test Cleaning

PHOTOGRAPH 7

Concrete slab following minimal sweeping and prepared for sample collection. Sample 9 was collected where indicated. Sample 10 was collected following vacuuming; Sample 11 was collected following pressure washing.



PHOTOGRAPH 8

Installation of plastic sheeting to collect wash water prior to pressure washing Sample 11. Note CMU wall marked for test cleaning and sampling in the background.

PHOTOGRAPH 9

CMU Wall prior to test cleaning with sample locations 23-25 marked.

Concrete Test Cleaning

PHOTOGRAPH 10

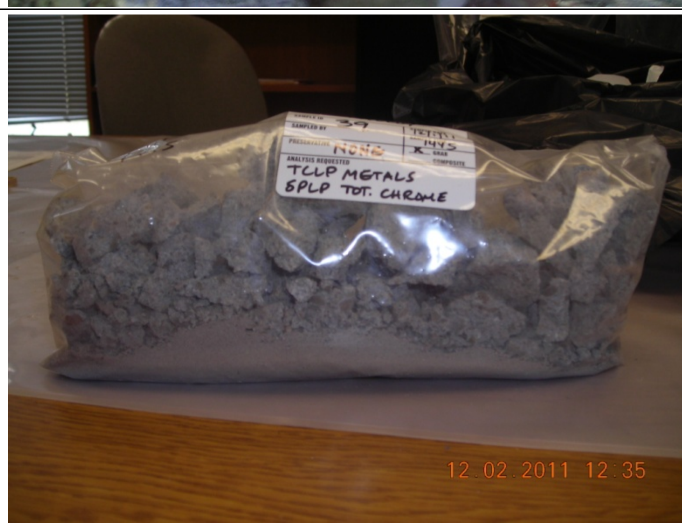
Loose CMU blocks (Samples 26-28) were retrieved from this debris pile on the ground floor of the North Mill Building.

PHOTOGRAPH 11

Loose CMU blocks (Samples 46-28) were retrieved from this debris pile on the ground floor of the South Mill Building.

PHOTOGRAPH 3

Typical sample of loose CMU (sample 39) after crushing. All CMU samples included fragments and fines.



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APPENDIX F
WASTE MANAGEMENT PLAN

PLAN

FINAL DRAFT

APPENDIX F
WASTE MANAGEMENT PLAN

Submitted To: Ohio Environmental Protection Agency
2195 Front Street
Logan, Ohio 43138

Submitted By: Cyprus Amax Minerals Company
333 N. Central Avenue
Phoenix, Arizona 85004

Prepared By: Golder Associates Inc.
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November 15, 2012 **Project No. 053-1695.170**

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Table of Contents

List of Tables

1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this Waste Management Plan (WMP) for the Former Satralloy Site (the Site) on behalf of Cyprus Amax Minerals Company (Cyprus Amax).

The Site consists of approximately 333.5 acres of land that includes an abandoned ferro-alloy plant. The Site is located in Cross Creek Township, Jefferson County, Ohio, approximately four miles south of Steubenville. Access is via County Road 74. The Site is bordered on the north, west, and south by Cross Creek, a perennial stream that empties into the Ohio River.

Certain materials from demolition and implementation of the Interim Action Workplan will be disposed off-Site. This WMP describes those materials and the applicable waste characterization, transportation and disposal procedures. This plan has been prepared as an appendix to the Interim Action Workplan.

Some materials will be transported off-Site for recycling. Because materials sent off-Site for recycling are not subject to waste regulations, these materials are not covered in this plan. However, on-Site management of these materials is addressed in the Interim Action Workplan. Recycled materials include, but may not be limited to: steel, metallic lead, and other metals.

Documentation of waste characterization, transportation, and disposal will be maintained in accordance with applicable local, state, and federal regulations. Copies of laboratory reports of waste analyses will be provided to the Ohio Environmental Protection Agency (OEPA).

2.0 ON-SITE MANAGEMENT

General aspects of on-Site management of wastes prior to shipment off-Site are described in this section. Details specific to a particular waste are described in Section 3.

2.1 Packaging and Labeling

All waste materials will be packaged in containers appropriate for transport of the waste.

Waste containers will be properly labeled and marked immediately upon placement of waste in the container. Bulk wastes will be identified with a sign that bears an appropriate waste label and any additional information that is required for waste area demarcation. Hazardous and regulated wastes will be labeled and marked in accordance with the requirements of applicable federal and state regulations.

2.2 Storage Duration

Hazardous wastes will be accumulated on-Site no longer than 90 days before shipment for off-Site disposal. Other wastes will be accumulated until sufficient material has accumulated for efficient rail transport.

2.3 Temporary Staging of Wastes

Where practical, wastes will not be moved until characterized and ready for shipment off-Site. In cases where the location of a waste interferes with the progress of interim actions, the waste will be relocated to an area of a concrete slab within the North Mill Building (under roof). Wastes staged in the North Mill Building will be transported off-Site before building demolition.

2.4 Railroad Car Loading Area

Waste materials that have been removed, packaged and labeled for off-Site disposal will be staged adjacent to the rail spur until loading for transport. It is intended to stage materials that have been packaged for off-Site disposal until suitable volumes accumulate to fill each railcar for transport.

The Railroad Car Loading Area will be located adjacent to the railroad spur northeast of the North Mill Building. This area will be of suitable size to accommodate material segregation. The area will be prepared by grading for proper drainage, laying geotextile and placing a 6-inch gravel layer over the geotextile.

Wastes will be segregated within this area, with each segregated area identified by signage. Segregated staging areas will be isolated by aisles to allow access by personnel and heavy equipment. An area will also be designated immediately adjacent to the rail spur for railcar loading equipment.

3.0 POTENTIAL WASTES

The majority of materials requiring off-Site disposal were identified in the regulated materials surveys (RMS) completed by Lawhon and Associates (Lawhon 2007, 2010). Table 1 summarizes the types of potential waste materials that will be disposed of off-Site. In addition to known wastes, additional materials may be encountered during interim action activities that could be disposed off-Site. Materials are grouped into the following off-Site waste disposal categories based on waste management requirements.

3.1 Asbestos Containing Materials

Non-friable and friable asbestos containing materials (ACM) are identified in the regulated material survey reports, and are classified as follows:

- Category I Non-friable ACM – Asphalt roofing is present on the Electrical, Administration Water Plant and Wastewater Buildings. These Category I materials are assumed to contain asbestos and are in good condition. Category I materials can be demolished with the structures and disposed at a Construction & Demolition Landfill. However, Category I ACM may be disposed with Category II ACM.
- Category II Non-friable Materials – Cement board transite panels, cement table tops/sinks/hoods, cement arc/fuse boxes, brakes, gaskets, and mixed debris are present in Site Buildings and other Site locations (Table 1).
- Regulated ACM (RACM) – Friable or potentially friable ACM includes thermal, conduit, pipe and tank insulations, and duct wrap. Asbestos abatement of interior areas containing friable asbestos will be accomplished by constructing a temporary containment system. Friable ACM outside of the friable containment enclosures will be abated using a glove bag containment/removal system.

3.2 Oils and Oil-Filled Equipment

Equipment that may contain oil identified in the RMS includes small motors for cranes, elevators, furnaces, and other mechanical equipment. Free-flowing oil from oil-filled equipment will be drained into appropriate storage containers and staged on-Site in drums approved by the United States Department of Transportation (DOT) with proper labeling pending waste characterization. All equipment openings will be sealed.

Oil containing polychlorinated biphenyls (PCBs) will be disposed in accordance with Toxic Substance Control Act (TSCA) regulations. Used oil not containing PCBs will be recycled in accordance with used oil regulations.

Equipment with PCB oils will be disposed off-Site at a TSCA facility. Other equipment will be recycled as scrap.

3.3 Unknown Drum Materials & Miscellaneous Chemicals

One 20-gallon drum of lubricating grease in the North Mill Building, one drum containing a dark blue gel in the Laydown Yard, and several bags and/or pails of dry-solid materials in the Mill Buildings and Wastewater Treatment Plant are identified in the RMS. Containers may be damaged and contents dispersed. The materials will be carefully placed in suitable containers to prevent spillage, segregated into similar waste classifications, to the extent possible, and properly labeled pending waste characterization and disposal. Lab-packing of damaged or deteriorated containers may be required.

3.4 Lead-Based Paint

Painted surfaces have been identified in several Site Buildings. Flaking paint will be removed with (and incorporated into) dust to be staged on-Site (see Section 5 of the Interim Action Workplan). It is not expected that there will be any lead-based paint requiring off-Site disposal.

3.5 Aerosol Paint Cans

Small quantities of aerosol paint cans have been identified at the Site. Because the contents of the cans are labeled, further waste characterization is not required. The containers will be placed in suitable containers, labeled, and staged for subsequent off-Site disposal.

3.6 PCB-Containing Materials

Fluorescent and high-intensity light ballasts and window caulk have been identified in Site Buildings. Light ballasts will be checked for manufacturer indications of the presence or absence of PCBs. Those ballasts which are clearly labeled as non-PCB containing will be managed separately from those not labeled. Non-PCB (labeled “PCB Free” or “No PCBs”) ballasts may remain in the fixture. All other ballasts encountered, labeled or unlabeled, will be carefully removed to avoid opening or damaging the ballasts during removal and handling. PCB-containing materials and caulking will be placed in sealed containers and staged for subsequent off-Site disposal.

3.7 TCE-Containing Materials

Possible TCE-containing fuses have been identified in Site buildings subsequent to completion of the RMS. All suspect TCE-containing fuses will be carefully removed and placed in sealed containers and staged for subsequent off-Site disposal.

3.8 Mercury Bulbs (Universal Waste)

Light bulbs will be carefully removed from the fixtures to prevent breakage and placed in appropriate sized containers equipped with dividers to isolate bulbs. The bulbs will be managed as universal waste and staged for subsequent off-Site disposal.

3.9 Mercury-Containing Equipment

Mercury containing devices may be encountered on-Site, such as thermostats, equipment switches or duct thermometers. Each suspect mercury-containing device will be removed and staged for subsequent off-Site disposal.

3.10 Welding Rods

Welding rods, which could contain chromium, have been identified in the Mill Buildings subsequent to completion of the RMS. Welding rods will be collected and placed in suitable containers and staged for subsequent off-Site disposal.

3.11 Miscellaneous Universal Waste / Recyclable Materials

Other materials that may be encountered at the Site will be recycled in accordance with applicable state and federal requirements. These materials include:

- Smoke Detectors and other potentially radioactive devices (such as self-illuminating exit signs)
- Chemical Fire Extinguishers
- Batteries
- Refrigerants

3.12 Scrap Tires

Used truck, car and equipment tires are present throughout the Site. The tires will be collected and staged for subsequent off-Site disposal.

3.13 General Debris and Miscellaneous Non-Hazardous Wastes

Construction and demolition (C&D) waste will be generated during abatement and demolition work, which will be disposed in a permitted C&D landfill. In addition, there will be miscellaneous solid non-hazardous wastes that will be disposed in a permitted non-hazardous (sanitary) landfill. The materials include baghouse fabric filters, wood used in the cooling towers, rail ties located along the former rail spurs, and non-ACM materials.

3.14 Empty Containers

An empty container that previously contained waste will either be disposed as waste in accordance with the characterization of the waste it contained, or be cleaned to meet regulatory requirements for an empty container and recycled.

4.0 WASTE CHARACTERIZATION

Wastes that have not been characterized already will be characterized as described in this section.

Additional waste characterization will not be required for certain materials, such as universal wastes, scrap tires, and materials transported off-Site for recycling, unless required by the disposal/recycling facility for approval of the waste profiles. These materials include:

- Aerosol paint cans
- TCE-containing Materials
- Mercury bulbs (Universal Waste)
- Welding rods
- Scrap tires
- Construction and demolition (C&D) wastes

Transite, including adhered chromium-containing dust, has been sampled and analyzed for TCLP, and found to be non-hazardous. This is documented in Appendix E of the Interim Action Workplan.

4.1 Asbestos-Containing Materials

Characterization and classification of most suspect ACM was completed during the RMS. Additional sampling and analysis of suspect-ACM encountered during interim action activities will be performed as necessary. All additional sampling and classification will be performed by an Asbestos Hazard Evaluation Specialist licensed by the Ohio Department of Health.

4.2 Oils

Used oil removed from equipment at the Site will be sampled and analyzed for PCBs. Oil containing PCBs will be disposed in accordance with TSCA regulations. Used oil not containing PCBs will be recycled in accordance with used oil regulations.

4.2.1 Unknown Drum Materials & Miscellaneous Chemicals

Representative samples will be obtained of chemicals to be disposed, including dry chemicals identified during the RMS (Table 1) and contents of drums that may be encountered on the Site. Where the chemical has identification (e.g., bag labels), chemical analysis to confirm the labeling will be performed. Where the chemical has no identification, chemical analysis sufficient to characterize the material for disposal will be performed; the analytical suite will depend on the nature of the chemical (i.e., liquid or solid) and where it was found. For example, a liquid sample will be analyzed for volatile and semi-volatile organic compounds, but a crystalline solid generally will not. All chemical samples will be analyzed by TCLP and, as necessary, ignitability, corrosivity, and reactivity.

5.0 WASTEWATER TREATMENT

Contaminated water requiring treatment may be generated during interim action activities. This wastewater will be treated on-Site using a package treatment system brought to the Site. The wastewater staging and treatment area will consist of three tanks in series and a particulate filter. The first tank will have sufficient holding time to settle most solids. The second tank will discharge to a three-stage particulate filter. The filtered water will be conveyed to the third tank, which will serve as a holding tank prior to on-Site reuse.

Batches of treated water in the holding tank will be sampled before re-use. These samples will be analyzed for:

- pH
- Total dissolved solids (TDS)
- Total suspended solids (TSS)
- Total chromium
- Hexavalent chromium

Treated water will be recycled on-Site for dust suppression. Treated water used on-Site may contain TDS, TSS, and total chromium. Water containing more than 11 µg/L hexavalent chromium will not be used on-Site, and will instead be further treated to remove the hexavalent chromium or disposed off-Site.

Upon completion of the work, settled solids will be removed from the treatment system. These solids will be bagged and placed in the Dust Staging Area (see Section 5 of the Interim Action Workplan).

6.0 TRANSPORTATION AND DISPOSAL

6.1 Transportation

All waste materials will be placed in DOT-approved shipping containers and properly labeled prior to shipment off-Site. It is intended to transport waste off-Site by rail to the maximum extent practical. However, road transport (truck hauling) could be used where rail is not practical.

To minimize the potential for contamination of the railcar or truck, wastes will be pre-packaged or the transport container will be lined. In some cases, transport containers may be dedicated to specific waste streams to prevent the possibility of cross-contamination. All containers and transportation vehicles will be appropriately marked and placarded according to DOT regulations.

6.2 Disposal

Off-Site disposal facilities for materials removed from the Site resulting from abatement and demolition activities will be permitted for the waste classification of materials being disposed and will provide copies of permits. All disposal facilities will be subject to audit and approval by Cyprus Amax prior to disposal. These facilities may include:

- RCRA Subtitle C (hazardous waste) landfill or other Treatment, Storage, or Disposal Facility (TSDF)
- RCRA Subtitle D landfill (non-hazardous), including ACM landfill
- Construction and debris (C&D) landfill
- Landfill approved for substances regulated under TSCA
- Universal Waste “destination” facility”
- Oil recycling facility (subject to used oil regulations)
- State-licensed scrap tire processing facility

7.0 REFERENCES

Lawhon and Associates (Lawhon). 2007. Regulated Materials Survey: Specified Buildings – Former Satralloy Site, Jefferson County, Ohio. Lawhon & Associates, Inc. May 18.

Lawhon. 2010. Material Sampling May 12, 2010 Satralloy Site. Letter report from Deborah Gray to Lee Holder. June 8.

TABLE

Table 1: Potential Wastes for Off-Site Disposal, Former Satralloy Site

Category	Material	Location(s)	Anticipated Quantity
Asbestos (Category II)	Cement board (intact and loose)	Site buildings; Loader, Train Canopy	365,000 sq. ft.
	Cement pipe, cement table top/sinks/hoods, cement fuse/arc boxes, brakes and gaskets, and misc. debris	Site buildings; Loader, Water Plant, debris in Laydown Yard, piles in Plant Area	8,000 lbs
	Fire bricks	Mill Buildings	2,000 bricks
Asbestos (Category I)	Asphalt roofing	Various buildings	10,000 sq. ft.
Asbestos (RACM)	Thermal, conduit, pipe and tank insulations, and duct wrap	Mill Buildings and Electrical Building	TBD
Oils	Oil from equipment (may contain PCBs)	Various buildings	TBD
Equipment	Equipment with PCB oils requires disposal at TCSA facility; other equipment recycled as scrap	Various buildings	TBD
Unknown Drum Materials	Unknown contents of drums (empty drums for steel recycling excluded)	Across Site	TBD
Dry Chemicals/Materials	Granular material in large burlap bag	North Mill Building	1 bag
	Red powder (dry chemical in bags)	South Mill Building	400 lbs
	Carbon and graphite (bags, pails, blocks, and large rods)	Mill Buildings	1,800 lbs
	Boric acid (bags)	South Mill Building	400 lbs
	Lime	Wastewater Treatment Plant	2,000 lbs
Lead-Based Paint	Painted wood and metal surfaces	Various buildings	0
Aerosol Paint Cans	Aerosol paint	Mill Buildings	TBD
PCB-Containing Materials	Fluorescent ballasts	Site buildings	200 ballasts
	High-intensity ballasts	Site buildings	140 ballasts
	Caulk	Site buildings	100 linear ft.
TCE-Containing Materials	Fuses	Site buildings	TBD
Mercury Bulbs (Universal Waste)	Fluorescent bulbs	Site buildings	180 bulbs
	High-intensity bulbs	Site buildings	350 bulbs
Mercury-Containing Equipment	Thermostats, switches, and thermometers	Site Buildings	TBD
Welding Rods	Welding rods	Mill Buildings	TBD
Misc Universal/Recyclable Waste	Non-lead acid batteries, refrigerants, etc.	Site Buildings	TBD
Scrap Tires	Scrap tires	Across Site	150-200 tires
Miscellaneous	General debris & misc. non-hazardous wastes	Across Site	TBD
	Filter bags	Baghouses	TBD
	Wood from cooling towers	Cooling towers	5,000 board ft.
	Rail ties	Former rail spurs	1,700 ties

APPENDIX G
TRANSITE PANEL TEST CLEANING REPORT

TECHNICAL MEMORANDUM

Date:	November 15, 2012	**Project No.:**	053-1695
To:	Barbara K. Nielsen	**Company:**	Cyprus Amax Minerals Company
From:	Lee Holder		
cc:		**Email:**	Barbara_Nielsen@FMI.com
RE:	**TRANSITE TEST CLEANING**		

On behalf of Cyprus Amax Minerals Company (Cyprus), test cleaning was performed on transite (asbestos cement) panels at the Former Satralloy Site in Jefferson County, Ohio (the Site) to:

- Evaluate the effectiveness of different cleaning methods.
- Determine if the transite needs to be cleaned to qualify as non-hazardous waste when disposed.
- Determine the asbestos content of dust generated by cleaning.

Background

Cyprus intends to demolish existing structures at the Site. The walls and roofs of the North and South Mill Buildings are constructed of asbestos cement panels, totaling approximately 360,500 square feet[1]. Due to historical chromium ore smelting and refining in the Mill Buildings, there were concerns that chromium-containing dust adhered to the transite panels (Photograph 1) could require specialized waste management. Preliminary demolition plans included the removal of dust accumulated on the panels prior to removal and preparation for disposal as asbestos containing material (ACM).

Two test cleaning pilot studies were conducted at the Site to evaluate the metals content of panels and the asbestos content of dust generated during cleaning. Golder Associates Inc. (Golder) selected panels for test cleaning and sampling that represent the various levels of dust accumulation visible at the site, and represent panels in both good and poor conditions.

The first study evaluated three types of proposed cleaning methods and the metals content of selected transite panels located in each Mill Building in January 2011. Based on the findings of the first study, a second study was conducted in June 2011 to evaluate a revised cleaning approach and to further analyze the metals content of select panels in each Mill Building.

This report describes the cleaning techniques evaluated, sampling procedures, and laboratory analytical results.

[1] Regulated Materials Survey, Lawhon & Associates, Inc., August 21, 2007

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1.0 INITIAL PILOT STUDY

The initial pilot study was conducted on January 12 and 13, 2011, at the Site. The objectives of this study were to:

- Evaluate three cleaning methods.
- Determine the asbestos content of dust generated by each cleaning method.
- Determine potential leaching of chromium from cleaned and un-cleaned panels using the Toxicity Characteristic Leaching Procedure (TCLP).
- Determine chromium concentrations on the surface of panels before and after cleaning.

Fieldwork was completed by Golder personnel, Soren Suver, and an Ohio-certified asbestos hazard evaluation specialist from Lawhon & Associates, Inc. Ohio Environmental Protection Agency (OEPA) was invited to observe but did not attend due to inclement weather.

1.1 Panel Selection for Test Cleaning

Test cleaning areas were identified in both Mill Buildings that included representative distributions of dust accumulation, and an equal distribution of good- and poor-condition panels.

Panel surfaces were visually inspected and assigned to three categories based on the visual extent of dust accumulation: Light, Moderate, and Heavy. A description of each category with photographic examples is contained in Attachment 1. For test cleaning purposes, adhered dust means the dust that is currently attached to the transite that will be removed by most cleaning methods that have been considered for the project - light brushing, heavy brushing, vacuuming, and combinations. Accreted dust is dust that is cemented onto the transite and cannot be removed by most cleaning methods, including vacuum methods with the brush attachment at the end of the vacuum wand, but requires a high impact force (scraping, high-pressure, etc.) to remove.

Panels were also classified as “good” or “poor” condition. Poor condition panels have been broken or cracked such that the interior of the panel is exposed. Good condition panels visually appear to be intact with no visible cracks. A poor condition panel is illustrated in Photograph 1, and a good condition panel is illustrated in Photograph 2.

Representative sampling areas were identified for the panels tested. A portion of the panel surface between 15 and 25 square feet in area was cleaned to generate enough dust for asbestos analysis and to collect a portion of the panel following cleaning for TCLP analysis. Panels with light dust accumulation required more surface area for test cleaning than panels with heavy dust accumulation.

Panels were selected in areas no more than 4 feet from a secure walking surface. Panels tested in the North Mill Building were located on the second floor exterior walls. Panels tested in the South Mill Building were located on the second and third floor exterior walls.

1.2 Test Cleaning Methods

Three different cleaning and dust collection techniques were evaluated during the initial pilot study and are discussed below.

1.2.1 Light Brush

The panel surface was lightly brushed using a standard nylon tire brush. Dust generated during cleaning was collected on a new dedicated sheet of plastic held beneath the brushed area. The brush was cleaned using a non-phosphate detergent and distilled water, rinsed in clean distilled water, and air-dried between cleaning locations.

1.2.2 Heavy Brush

The panel surface was brushed with extra force in order to dislodge all visible evidence of dust accumulation on the panel. This procedure removed adhered dust, but did not removed accreted dust. Dust generated during cleaning was collected on a dedicated sheet of plastic held beneath the brushed area. The brush was cleaned using a non-phosphate detergent and distilled water, rinsed in clean distilled water, and air-dried between test cleaning locations.

1.2.3 Vacuum

The panel surface was vacuumed using a standard shop vacuum with a HEPA exhaust filter and a nozzle with a nylon brush attachment to dislodge all visible evidence of dust adhered on the panel. This procedure removed loose dust and adhered dust, but did not removed accreted dust. Dust generated during cleaning was collected in the vacuum in a dedicated disposable plastic bag. A new bag was used for each sample location.

1.3 Test Cleaning Observations

It became apparent during initial test cleaning that light brushing did not generate a sufficient quantity of dust for laboratory analysis, so this technique was subsequently abandoned.

The initial cleaning and sampling plan identified interior panel surfaces for dust and wipe sampling. Panel exterior surfaces were to be cleaned by hard brushing only where a portion of the panel would be removed for TCLP analysis. While hard brushing the exterior surface of sample location TLB-1, the technician observed small flakes of the panel material forming on the panel. The flakes could be dislodged with additional hard brushing. Similar flaking of panel material was not observed while cleaning any interior locations. The sampling plan was modified to collect dust samples while cleaning the exterior panel surfaces when flaking is observed as described in Section 1.2.2.

1.4 Sample Collection and Analysis

Samples collected during the test cleaning event were labeled according to the panel condition and cleaning technique employed. In addition, wipe samples of two un-cleaned panels in the South Mill

Building were collected and labeled D-1 and D-2. An un-cleaned portion of a damaged panel was also collected from the North Mill Building and labeled DUC-1.

A total of 13 cleaning dust samples were collected for asbestos analysis: 11 from interior panel surfaces, and 2 from exterior panel surfaces. A total of 14 wipe samples were collected: 12 from cleaned panel surfaces, and 2 from un-cleaned panel surfaces. A total of 6 panel samples were collected for TCLP analysis.

1.4.1 Dust from Panel Cleaning

Dust generated during the cleaning procedure was collected as described in Section 1.2. Cleaning continued until approximately 4 oz. of cleaning dust accumulated on the plastic sheet. A grab sample of the cleaning dust collected from each panel was carefully placed into pre-cleaned glassware, labeled, and inventoried on the chain-of-custody form.

The dust samples were transported by laboratory courier and analyzed by TestAmerica, Inc. Sample analysis was performed using Polarized Light Microscopy (PLM) with dispersion staining techniques in accordance with the methodology approved by the United States Environmental Protection Agency (USEPA) “Method for the Determination of Asbestos in Bulk Building Materials” (EPA/600/R-93/116, July 1993) following EPA test methods 600/M4-82-020 & 600/R-93-116 down to 1%.

1.4.2 Surface Wipes

Surface wipe grab samples were collected following cleaning using laboratory-supplied gauze wipes pre-moistened with de-ionized water. Samples designated D-1 and D-2 were collected from un-cleaned panel surfaces. Each wipe was placed into a laboratory-supplied glass vial, labeled, and inventoried on the chain-of-custody form. The wipe samples were transported by laboratory courier and analyzed by TestAmerica, Inc., for total chromium following USEPA test method 6020A, and for hexavalent chromium following USEPA test method 7196A.

1.4.3 Panels

A portion of five transite panels was removed following cleaning of the interior and exterior surfaces. A portion of one poor condition panel with a heavy dust accumulation was also collected and designated DUC (Photographs 3 and 4).

A portion of the panel was selected based on the designated panel condition for removal and sampling. The area selected for Good Condition panels did not include the edges of the panel. The area selected for Poor Condition panels included broken and exposed edges of the panel material. Core samples could not be collected using power equipment due to known asbestos content of the panels.

The portions of each panel were removed and analyzed for TCLP Metals using the following sampling procedure in an effort to minimize exposure to airborne asbestos fibers and other potential contaminants, and to ensure collection of the panel and any materials remaining adhered to the panels:

- Impermeable drop cloths were placed beneath the transite panel in areas most likely to be affected (i.e. ground surface) by falling debris during sampling.
- Water was applied to the sample location to minimize dust generation.
- Once the sample area was adequately wetted, the sampling team used a hammer to break off an approximately 100 in^2 (200 g) portion of the transite panel.
- The broken sections of panels and any other dislodged debris that fell onto the drop cloth was collected and placed in a labeled, leak tight plastic bag and sealed. Each bag was then placed inside another plastic bag and sealed.

Each double-bagged sample was labeled and inventoried on a chain-of-custody form. Golder personnel delivered the samples to Pace Analytical Services, Inc., (Pace) Columbus, Ohio, for additional preparation and analysis, which also performs asbestos analysis and has the capability to reduce particle size of asbestos-containing materials. Pace performed the following procedure to prepare the sample for analysis:

- Each Panel was placed in a large plastic bag. The bag was then wrapped in a cloth and pounded with a hammer, in a hood, until there appeared to be sufficient small pieces to fit through the 3/8-inch sieve. All small contents within the bag including all dust partials were poured out of bag and into 3/8-inch sieve. The sieve was shaken and the material that passed through sieve was used for TCLP leaching. This included portions of the fine dust particles.

Following preparation, Pace analyzed the samples following TCLP test methods 1311/6010/7470 for the metals arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury.

1.5 Analytical Results

Following is a discussion of the analytical results for the samples collected during the initial pilot study. The results are summarized in Table 1.

1.5.1 Cleaning Dust

Asbestos was detected above 1% in three cleaning dust samples that were cleaned by heavy brushing or vacuuming. The highest asbestos content of 10% Chrysotile was detected in sample THB-1 exterior, where flaking of the panel surface was observed during hard brushing.

1.5.2 Surface Wipes

Total chromium in wipe samples from cleaned panels ranged from 0.0131 to 0.469 mg/wipe. Total chromium in wipe samples from un-cleaned panels ranged from 0.423 to 1.46 mg/wipe.

Hexavalent chromium was not detected above the laboratory reporting limits of 0.125 mg/wipe in any wipe samples collected from cleaned or un-cleaned surfaces.

1.5.3 TCLP on Panels

Chromium in TCLP leachate from cleaned panels ranged from ranged from 0.063 to 0.136 mg/L. Chromium in TCLP from an un-cleaned panel was 0.123 mg/L. All results were below the hazardous waste limit for the toxicity characteristic of 5 mg/L. No other metals were detected in the TCLP leachate. Therefore, the transite panels when disposed as waste (cleaned or not) are not classified as hazardous waste.

2.0 SECOND PILOT STUDY

A second test cleaning pilot study was conducted June 8 and 9, 2011, at the Site. The objectives of this study were to:

- Evaluate a revised cleaning procedure.
- Determine the asbestos content of dust generated by the cleaning method.
- Determine potential leaching of chromium from cleaned and un-cleaned panels using the Toxicity Characteristic Leaching Procedure (TCLP).

The test cleaning was performed by Neumeyer Environmental Services, Inc. Sampling was completed by Golder personnel, including a licensed asbestos hazard evaluation specialist. An Ohio EPA representative was at the Site to observe during portions of the test cleaning procedure.

2.1 Panel Selection for Test Cleaning

Test cleaning areas were identified in both Mill Buildings that included representative distributions of dust accumulation, and an equal distribution of good- and poor-condition panels. Two panels were identified with very heavy dust accumulation in the vicinity of the exterior dust bins in the rear of the North Mill Building (Photographs 4 and 5). Neither panel was cleaned prior to sampling for TCLP analysis.

2.2 Test Cleaning Method

Based on the results of the initial test cleaning, a revised cleaning procedure was proposed to minimize abrasion to the panel surface and utilize the cleaning technique and equipment proposed by the abatement contractor. A detailed description of the proposed cleaning procedure is included in Attachment 2, and summarized below:

- A high-pressure vacuum was used to remove chromium dust from the panels. The vacuum hose is fitted with a stiff nylon brush attachment. This 100-HP vacuum was equipped with a HEPA filtered for the exhaust air.
- A cyclone separator was positioned prior to the HEPA filter and is equipped with a gate valve that allows the vacuumed dust to be discharged. Dust samples from each test area were collected from the cyclone separator prior to discharge into collection bags. The

procedure was modified during test cleaning to employ a new, dedicated collection bag for each grab sample to expedite sample retrieval.

- The slide gate valve was partially opened to allow a sample jar to be filled with the dust. After sample collection, the valve was fully opened to discharge the collected dust to the collection bag.
- The interior and exterior panel surfaces were cleaned separately and separate cleaning dust samples were collected from each surface.

2.3 Sample Collection and Analysis

Samples collected during the test cleaning event were labeled according a panel designation number assigned to each test cleaning location. Locations 1 through 9 are located in the North Mill Building, and locations 10-18 are located in the South Mill Building. A total of 35 dust samples were collected (an interior and exterior cleaning dust sample from each panel, except panel 18, where the interior and exterior dust sample was combined).

Locations N1 and N2 are un-cleaned portions of panels collected from the North Mill Building. A total of 20 panel samples were collected for TCLP analysis: 18 from cleaned panels and 2 from un-cleaned panels.

2.3.1 Cleaning Dust

Dust generated during the cleaning procedure was collected as described in Section 2.2. A grab sample of the collected dust from each panel was carefully placed into pre-cleaned glassware, labeled, and inventoried on the chain-of-custody form. The dust samples were transported by laboratory courier and analyzed by TestAmerica, Inc. Sample analysis was performed using PLM with dispersion staining techniques in accordance with the methodology approved by the EPA "Method for the Determination of Asbestos in Bulk Building Materials" (EPA/600/R-93/116, July 1993) following EPA test methods 600/M4-82-020 & 600/R-93-116 down to 1%. Sample results exhibiting a <1% or greater asbestos content were further analyzed in accordance with EPA/600/R93/116 (down to <0.25%) 400 point count, July 1993, to confirm sample results.

2.3.2 Panels

Portions of each panel were removed following cleaning of the interior and exterior surfaces. Sample collection, preparation, and laboratory analysis was completed as described in Section 1.4.3.

Two samples were collected from un-cleaned samples that contain heavy accumulations of dust. Both panels were located where exterior surfaces face the bag houses in the rear of the North Mill Building. Sample N2 was already dislodged and did not require force to remove.

Golder personnel transported the samples to Pace. Pace performed sample preparation and analysis as described in Section 1.4.3.

2.4 Analytical Results

The analytical results for the second study are discussed below and are summarized in Table 2.

2.4.1 Cleaning Dust

The initial PLM laboratory analysis down to 1% detected asbestos above 1% in three cleaning dust samples. However, confirmatory 400-point count analysis down to 0.25% did not detect asbestos above 1% in any of the cleaning dust samples.

2.4.2 Panels

Chromium in TCLP leachate from cleaned panels ranged from ranged from <0.05 to 0.293 mg/L. Chromium in TCLP from two un-cleaned panels were 0.11 and 0.278 mg/L. All results were below the hazardous waste limit for the toxicity characteristic of 5 mg/L. No other metals were detected in the TCLP leachate. Confirming the results of the initial testing, the transite panels when disposed as waste (cleaned or not) are not classified as hazardous waste.

3.0 SUMMARY AND CONCLUSIONS

For the transite panels, dust removal techniques have been evaluated using field testing. Representative samples of the transite panels with no dust removal and with varying degrees of cleaning were analyzed by the TCLP. Initial testing showed that cleaning could results in asbestos in the removed dust. None of the panels exceeded TCLP limits (including panels with no cleaning). Therefore, the transite panels can be disposed as non-hazardous waste without cleaning. ACM landfills being considered as potential disposal facilities for this transite confirmed that they could receive and dispose of ACM with chromium-containing dust so long as the panels do not fail TCLP.

List of Attachments

Table 1	Summary of Results for Initial Pilot Test Cleaning
Table 2	Summary of Results for Second Test Cleaning
Attachment 1	Dust Accumulation/Accretion on Panels
Attachment 2	Pilot Study Test Cleaning Procedure
Attachment 3	Photograph Log - Asbestos Cement Panel Test Cleaning and Sampling

TABLES

TABLE 1
SUMMARY OF RESULTS FOR INITIAL PILOT TEST CLEANING

		Dust	Wipe Samples		Transite Panels	
Sample Location	Collection Date	Asbestos	Total Chromium (mg/wipe)	Hexavalent Chromium (mg/wipe)	TCLP Total Chromium (mg/L)	Notes
Regulatory Limit	--	1%	NA	NA	5.0	
DHB-1	1/12/2011	< 1% Chrysotile	0.0791	<0.125	0.087	Deteriorated panel after hard brush; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing/cleaning (2nd floor north building)
DHB-7	1/13/2011	< 1% Chrysotile	0.014	<0.125	--	Deteriorated panel after hard brush; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing/cleaning (2nd floor south building)
DHB-10	1/13/2011	**5% Chrysotile**	0.0206	<0.125	--	Deteriorated panel after hard brush; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing/cleaning (2nd floor south building)
DVAC-1	1/12/2011	< 1% Chrysotile	0.0866	<0.125	0.071	Deteriorated panel after vacuum; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing and vacuum cleaning (2nd floor north building)
DVAC-3	1/12/2011	**2% Chrysotile**	0.0625	<0.125	--	Deteriorated panel after vacuum; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing and vacuum cleaning (2nd floor north building)
DVAC-6	1/13/2011	< 1% Chrysotile	0.0154	<0.125	--	Deteriorated panel after vacuum; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing and vacuum cleaning (2nd floor south building)
THB-1 Exterior	1/12/2011	**10% Chrysotile**	No Sample	No Sample	(see TLB-1)	Exterior of TLB-1 after hard brush to prepare for TCLP sample; thin layer of dust; small flakes of panel material observed when **heavy** brushing/cleaning (but were not observed when brushing panel interiors)

TABLE 1
SUMMARY OF RESULTS FOR INITIAL PILOT TEST CLEANING

		Dust	Wipe Samples		Transite Panels	
Sample Location	**Collection Date**	**Asbestos**	**Total Chromium (mg/wipe)**	**Hexavalent Chromium (mg/wipe)**	**TCLP Total Chromium (mg/L)**	**Notes**
Regulatory Limit	**--**	**1%**	**NA**	**NA**	**5.0**	
THB-2	1/12/2011	< 1% Chrysotile	0.0717	<0.125	0.065	In tact panel after hard brush; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing/cleaning (2nd floor north building)
THB-2 Exterior	1/12/2011	< 1% Chrysotile	0.469	<0.125	(see THB-2)	Exterior of THB-2; heavy layer of encrusted material before cleaning; moderate layer after **heavy** brushing/cleaning; less flaking observed than at THB-1 Exterior (though encrusted material may have reduced flaking)
THB-5	1/13/2011	< 1% Chrysotile	0.044	<0.125	--	In-tact panel after hard brush; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing/cleaning (2nd floor south building)
THB-8	1/13/2011	< 1% Chrysotile	0.0465	<0.125	--	In-tact panel after hard brush; moderate layer of encrusted material and dust before cleaning; thin layer of encrusted material remaining after **heavy** brushing/cleaning (2nd floor south building)
TLB-1	1/12/2011	No Sample (De-minimis dust generated)	0.279	<0.125	0.063	In tact panel after light brush; thin layer of dust with little encrusted material before cleaning; visually "clean" after **light** brushing (2nd floor north building)
TVAC-2	1/12/2011	ND	0.0739	<0.125	0.136	In tact panel after vacuum; heavy layer of encrusted material and dust pre-cleaning; moderate layer of encrusted material remaining after **light** brushing and vacuum cleaning (2nd floor north building)
TVAC-4	1/13/2011	ND	0.0246	<0.125	--	In-tact panel after vacuum; moderate layer of encrusted material and dust pre-cleaning; thin layer of encrusted material remaining after **light** brushing and vacuum cleaning (2nd floor south building)

TABLE 1
SUMMARY OF RESULTS FOR INITIAL PILOT TEST CLEANING

		Dust	Wipe Samples		Transite Panels	
Sample Location	**Collection Date**	**Asbestos**	**Total Chromium (mg/wipe)**	**Hexavalent Chromium (mg/wipe)**	**TCLP Total Chromium (mg/L)**	**Notes**
Regulatory Limit	**--**	**1%**	**NA**	**NA**	**5.0**	
TVAC-9	1/13/2011	< 1% Chrysotile	0.0131	<0.125	--	In-tact panel after vacuum; moderate layer of encrusted material and dust pre-cleaning; thin layer of encrusted material remaining after **light** brushing and vacuum cleaning (2nd floor south building)
D-1	1/13/2011	No Cleaning	1.46	<0.125	--	Transite Panel with heavy dust accumulated; wipe sample collected without any cleaning (3rd floor south building)
D-2	1/13/2011	No Cleaning	0.423	<0.125	--	Transite Panel with heavy dust accumulated; wipe sample collected without any cleaning (3rd floor south building)
DUC	1/12/2011	No Cleaning	No Sample	No Sample	0.123	Deteriorated panel with heavy layer of encrusted material and dust; no cleaning attempted (though it was "hammered" to break) (2nd floor north building)

Notes:

-- *Not Sampled*

Sampling Stations 1-3 located on 2nd Floor of North Mill Building; 4-10 on 2nd floor of South Mill Building.

DUC transite panel collected from encrusted portion of a panel between station 1 and station 2 in North Mill Building.

TABLE 2
SUMMARY OF RESULTS FOR SECOND PILOT TEST CLEANING

Sample Location Number	Panel Condition	Building	Dust Accumulation Interior	Dust Accumulation Exterior	Cleaning Method	Asbestos Lab Results PLM EPA 600/R-93-116 (Down to 1%)		Asbestos Lab Results Point Count PLM EPA 600/R-93-116 (Down to 0.25%)		TCLP Lab Results
	Good (G) Poor (P)	North (N) South (S)	Low (L) Mod (M) High (H)	Low (L) Mod (M) High (H)	Aggressive (A) Normal (N)	Interior Dust	Exterior Dust	Interior Dust	Exterior Dust	Chromium (mg/L)
1	G	N	M	H	A	**2% Chrysotile**	**2% Chrysotile**	0.75% Chrysotile	0.5% Chrysotile	0.12
2	P	N	M	M	N	< 1% Chrysotile	< 1% Chrysotile	0.25% Chrysotile	0.25 Chrysotile	0.121
3	P	N	L	M	N	ND	< 1% Chrysotile	Not Applicable	0.5% Chrysotile	0.082
4	G	N	H	L	N	< 1% Chrysotile	< 1% Chrysotile	0.25% Chrysotile	0.25% Chrysotile	0.064
5	G	N	M	L	N	< 1% Chrysotile	< 1% Chrysotile	ND	0.25% Chrysotile	0.06
6	G	N	H	H	N	< 1% Chrysotile	< 1% Chrysotile	ND	ND	0.104
7	P	N	M	M	N	ND	ND	Not Applicable		0.293
8	P	N	L	H	N	< 1% Chrysotile	< 1% Chrysotile	ND	0.25% Chrysotile	0.122
9	G	N	L	H	N	ND	ND	Not Applicable		0.111
N1	G	N	M	H	Not Cleaned	Not Applicable		Not Applicable		0.11
N2	P	N	H	H	Not Cleaned	Not Applicable		Not Applicable		0.278
10	G	S	M	M	N	< 1% Chrysotile	ND	0.25% Chrysotile	Not Applicable	<0.05
11	P	S	M	L	N	**2% Chrysotile**	< 1% Chrysotile	0.5% Chrysotile	0.25% Chrysotile	0.059
12	P	S	M	L	N	< 1% Chrysotile	< 1% Chrysotile	0.25% Chrysotile	ND	0.06
13	G	S	L	M	N	< 1% Chrysotile	ND	ND	Not Applicable	0.114
14	G	S	H	L	N	ND	< 1% Chrysotile	Not Applicable	0.25% Chrysotile	<0.05
15	G	S	H	L	N	ND	< 1% Amosite < 1% Chrysotile	Not Applicable	0.5% Chrysotile	0.115
16	P	S	H	M	N	< 1% Chrysotile	< 1% Chrysotile	ND	0.25% Chrysotile	0.1
17	P	S	M	M	N	ND	ND	Not Applicable		0.115
18	P	S	M	H	N	Combined - ND		Not Applicable		0.077

Golder Associates

ATTACHMENT 1
DUST ACCUMULATION/ACCRETION ON PANELS

Dust Accumulation/accretion on Panels

Heavy Dust Accumulation

An accumulation of adhered and accreted material generally exceeding ¼-inch in thickness. After cleaning, anticipate much of the material will remain in an accreted form.

Moderate Dust Accumulation

Visible coating of adhered and/or accreted material generally 1/10-inch up to ¼-inch in thickness. The texture of the cement panel surface is generally not visible. After cleaning, anticipate a thin layer of material will often remain in accreted form, but the texture of the panel surface is typically visible beneath the accreted layer.

Light Dust Accumulation

Visible adhered dust less than 1/10-inch with the texture of the cement panel surface clearly visible. After cleaning, all but possibly a very thin (mil-range/film) layer of accreted material is usually removed.

Terminology

Adhered dust means the dust that is currently attached to the transite that will be removed by most cleaning methods that have been considered for the project - light brushing, heavy brushing, vacuuming, and combinations.

Accreted dust is dust that is cemented onto the transite and cannot be removed by most cleaning methods, including vacuum methods with the brush attachment at the end of the vacuum wand, but requires high impact force (scraping, high-pressure, etc.) to remove

ATTACHMENT 2
PILOT STUDY TEST CLEANING PROCEDURE

NEUMEYER
Environmental Services, Inc.

June 1, 2011 Updated June 3, 2011 Sent via email: Steve_Sheridan@URSCorp.com

Steve Sheridan
Cleveland Wrecking Company
12100 Mosteller Rd. #100
Cincinnati, OH 45241

RE: Cyprus Amax Minerals Satralloy Abatement and Demolition Work

Subject: Pilot Study Work Plan

Neumeyer Environmental Services, Inc. (NES) is providing this Pilot Study Work Plan to describe the procedures to be employed to achieve the objective for the study.

Purpose

The purpose and intent of the dust removal testing is to determine the minimum removal of dust from transite resulting in transite waste that will not be considered hazardous based on the Toxicity Characteristic Leachate Procedure (TCLP), in other words, transite waste where the TCLP chromium results are <5 mg/L. In addition, the testing will determine if the dust removal procedure results in an unacceptable level of asbestos in the airborne dust.

Overview

Utilize high pressure HEPA-filtered vacuum equipment to remove chromium dust from the transite sheets. The vacuum hose will be fitted with a stiff nylon-bristled brush attachment to break loose adhered dust. As the dust is dislodged, it will be drawn into the vacuum hose. The 100 HP vacuum unit to be utilized is equipped with a HEPA-filtered exhaust air discharge. A cyclone separator is positioned prior to the HEPA filter. The cyclone separator is equipped with a gate valve that allows the vacuumed waste to be discharged to a container.

Test Areas

Test areas will be selected by the Owner in both the North and South Mill Buildings representing various removal conditions. Each area will be approximately 5 feet by 5 feet located no more than four feet from a secure walking surface, (i.e. no elevated areas will be tested). Each area will be assigned a distinct number for reference. The area perimeter will be marked with paint to identify the boundaries. Temporary lighting will be installed in order to provide proper illumination.

Sampling Waste samples from each test area will be collected from the cyclone separator prior to discharge into the waste disposal bags. The slide gate valve will be partially opened to allow a sample jar to be filled with the dust. After sample collection, the valve will be fully opened to discharge the collected dust to the waste disposal bag. This procedure will allow samples to be collected from each discrete test area. Samples will be provided to the Owner's Representative for analysis.

Worker Protection

Workers conducting the study will be trained in accordance with OSHA 1910.120, Hazardous Waste Operations and Emergency Response. The workers will be equipped with Personal Protective Equipment (PPE) including the following:

- Full body Tyvek cover-alls
- Steel-toed work boots under rubber pull over boots
- Surgical rubber gloves under leather-palmed work gloves
- Hard Hat
- Safety Glasses
- Full face respirator equipped with HEPA cartridges.

Equipment and Materials

- 100 HP HEPA Filtered vacuum unit
- Portable electric generator (20 KVA)
- Temporary lighting, tripod-mounted unit
- 2,000 CFM HEPA-filtered exhaust fan
- Rough terrain fork truck to manage bagged waste
- 6-mil plastic bags (34”x60”) for PPE disposal
- 1 cy Heavy duty nylon sacks for waste disposal
- Water for decontamination (minimum two barrels ~100 gallons)
- Brushes for decontamination
- Cloths to wipe down cyclone unit

Manpower
Project Manager
Health and Safety Officer
Superintendent
2 Technicians
Equipment operator

Procedure

1. Workers will don personal protective equipment (PPE) and begin test area preparation.
2. Work areas will be delineated and the work areas will be numbered and labeled.
3. Temporary lighting will be installed, the portable generator will be connected and the system will be checked.
4. A 2000 CFM HEPA filtered exhaust fan will be placed in the work area to capture secondary dust that may be dislodged from surrounding structural members or transite falling into the work area. A flexible intake duct will be directed near the work area to collect any migrated dust possibly dislodged during the vacuuming operation. Hoses from the vacuum unit will be setup in the work area(s).
5. A flexible exhaust duct will be fitted to the fan to divert the exhaust air flow into the large bay area of the Mill Building to prevent exhaust air from disturbing adjacent dust causing a possible release to the outside air.
6. The surface of the transite sheet will be vacuumed until the surface appears to be visually clean. A two man team will work during the vacuuming operation. One worker will operate the vacuum hose to remove and brush the dust from the sheet. The second worker will hold the exhaust fan air intake hose near the work area to collect any fugitive dust dislodged during the vacuuming operation. Workers will not remove any accreted dust from the transite.
7. After each transite section is vacuumed the gate valve on the cyclone separator will be opened for the Owner to collect the dust into two ounce jars.

8. After collecting the sample the cyclone will be wiped clean.
9. Equipment decontamination will be performed at the completion of the pilot tests.
10. Personnel decontamination will be performed after each area is tested prior to moving to the next area.
11. Workers will don personal protective equipment (PPE) and begin test area preparation.
12. Work areas will be delineated and the work areas will be numbered and labeled.

Thank you for the opportunity to assist you with this project. If you have any questions or comments, please contact us at your convenience.

Sincerely,

Fred C. Neumeyer
President
fred@neumeyerenvironmental.com

ATTACHMENT 3
PHOTOGRAPH LOG
ASBESTOS CEMENT PANEL TEST CLEANING AND SAMPLING

ASBESTOS CEMENT PANEL TEST CLEANING AND SAMPLING	
PHOTOGRAPH 1 Typical pattern of dust accumulated on the interior of a poor condition panel in the North Mill Building. Also the location of sample DVAC-1 prior to test cleaning in January 2011.	
PHOTOGRAPH 2 A good condition panel with a moderate dust accumulation in the interior of the North Mill Building. Location TVAC-4 prior to test cleaning in January 2011.	
PHOTOGRAPH 3 Exterior view of DUC poor condition panel. The panel sample was collected from the broken section near the center of the photo, which is heavily encrusted with dust.	

ASBESTOS CEMENT PANEL TEST CLEANING AND SAMPLING	
PHOTOGRAPH 4 Interior view of DUC panel before panel sample collection In January 2011. A moderate layer of accreted dust is visible in the photo. A heavy layer is present on the upper portion of the panel which was collected for TCLP analysis.	
PHOTOGRAPH 5 Panel sample N1 was collected from the upper portion of the good condition panel in June 2011. The panel was not cleaned prior to sample collection.	
PHOTOGRAPH 6 Panel sample N2 was collected from the already dislodged poor condition panel visible in the bottom of the photo in June 2011. The panel had a heavy dust accumulation on the interior and exterior surfaces.	

ASBESTOS CEMENT PANEL TEST CLEANING AND SAMPLING

PHOTOGRAPH 7

Vacuum cyclone unit used during final pilot test in June 2011.

PHOTOGRAPH 8

Vacuum nozzle and brush attachment used during the final pilot test cleaning in June 2011. Interior view of location 14 while cleaning. Location 15 is visible to the left.

PHOTOGRAPH 9

Close-up view of location 6 interior following cleaning and prior to panel sample collection for TCLP in June 2011. Material remained adhered to the panel when collected for TCLP analysis.

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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