

# **INTERIM REMEDIAL MEASURE (IRM) WORK PLAN – OPERABLE UNIT (OU) 5**

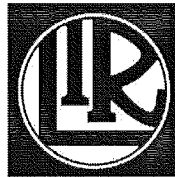
For the

**Spaulding Fibre Site**  
Tonawanda, New York

**PREPARED FOR:**

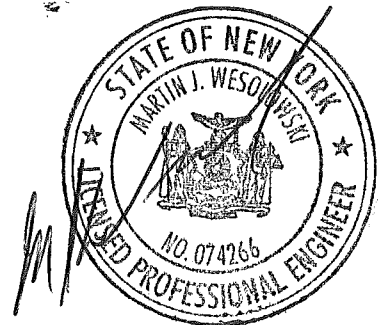
Erie County Industrial Development Agency

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## **1.0 INTRODUCTION**

LiRo Engineers, Inc. (LiRo) is in contract agreement with the Erie County Industrial Development Agency (ECIDA) to provide a Site Investigation and Remedial Alternatives Report (SI/RAR) for the Spaulding Fibre Site (Spaulding) in Tonawanda, New York. The site location, 310 Wheeler Street in the City of Tonawanda, Erie County, New York, is shown on Figure 1. The property is bounded by Dodge and Enterprise Avenues and residential property to the north, Wheeler Street and a mix of commercial and residential properties to the east, Hackett Drive and commercial properties to the south, and Hinds Street and a mix of commercial and residential properties to the west.

The Spaulding Fibre SI/RAR is being conducted under a NYSDEC Environmental Restoration Program (ERP) State Assistance Contract with the City of Tonawanda, Erie County and ECIDA. The Spaulding Fibre Steering Committee (Committee) is comprised of representatives from those three groups plus the Town of Tonawanda and Empire State Development Corporation. NYSDEC is responsible for oversight of the investigation as well as review and approval of project deliverables.

In completion of the Site Investigation phase of the project, LiRo submitted Work Plans (October 17, 2007), a site Health and Safety Plan (September 14, 2007), a Citizen Participation Plan (September 21, 2007), a Site Investigation Report (May 20, 2008), and a Supplemental Investigation Report (January 30, 2009). Based on the Site Investigation results and evaluation of remedial alternatives, it was determined that most of the site contamination could be efficiently addressed through a non-emergency Interim Remedial Measure (IRM). This IRM Work Plan was prepared to identify the specific requirements for implementing the IRM work.

### **1.1 Site Background**

The Spaulding Fibre site is located at 310 Wheeler Street in the City of Tonawanda, New York on approximately 46 acres of land. The former Spaulding facility primarily produced two families of products - vulcanized fiber and composite laminates. Spaulding produced vulcanized fiber in its early history by treating paper (produced in an on-site paper mill) with zinc chloride solution. During this period, a substantial plant expansion occurred in the 1920s.

By the 1940's, most of the present plant floor area had been constructed and facilities added to produce a second family of products – composite laminates. Spaulding produced these laminates by impregnating natural fibers with resins. This material was sold under the trade name

Spauldite and many of the phenolic resins used in production were manufactured on-site. The primary raw chemicals used to produce the resins include: phenol, formaldehyde, aniline, cresylic acids, phthalates, methanol, ethanol, toluene, acetone, methylethyl ketone, benzene and ammonium hydroxide. The Spauldite manufacturing operation underwent an expansion in 1981. Plant operations were organized into the following four operating Departments: Paper Mill, Fibre Sheet, Fibre Tube, and Spauldite Sheet Departments.

Approximately 20 acres of the 46-acre site were developed with former plant buildings and structures (Figure 2). The plant was decommissioned in 1992 when operations ceased. A building demolition program was initiated in 2006 by the Spaulding Fibre Steering Committee, and approximately 500,000 square feet of former plant structures have been cleaned and demolished. It is anticipated that all of the site buildings and a large portion of the plant floor slabs will be demolished by Fall of 2009.

Site-wide investigations/assessments began in the late 1980s when a Resource Conservation and Recovery Act (RCRA) Facility Audit (RFA) was performed at the facility by a United States Environmental Protection Agency (USEPA) contractor under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The RFA Report identified 38 Solid Waste Management Units (SWMUs) and additional potential areas of concern (AOCs).

The plant closed in 1992 and initially declared bankruptcy in 1993. Spaulding initiated decommissioning activities at the site in August 1992. The majority of these activities were completed from September 1992 to February 1993 with the remaining activities completed by mid-1995. These activities are documented in the Plant Decommissioning Final Report dated August 1995 and approved by the NYSDEC by letter dated August 30, 1995.

Following the closure of the plant, Spaulding and NYSDEC entered into a RCRA Corrective Action Order on Consent for the performance of a RCRA Facility Investigation/Corrective Measures Study (RFI/CMS) and into an Order on Consent for the performance of a Remedial Investigation/Feasibility Study (RI/FS) at the Site. Spaulding completed concurrent Remedial Investigation/RCRA Facility Investigation (RI/RFI) and Feasibility Study/Corrective Measures Study (FS/CMS) to evaluate the contamination at the State Superfund portion of the Spaulding Composites Site, and to evaluate remedial alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste. This was a joint project between the State CERCLA and RCRA programs, with overall NYSDEC management, coordination and oversight provided by CERCLA staff. To satisfy both programs, Spaulding decided to conduct a single

investigation of the site which was implemented by Spaulding's consultant, CRA, through the mid 1990s.

Using the RI/RFI data, potential remedial alternatives were identified, screened and evaluated in the report entitled: *Feasibility Study and Corrective Measures Study* dated December, 2000. The remedial alternatives were presented and discussed at a public meeting in 2002 and remedies for four identified operable units (OU1, OU2, OU3 and OU4) were subsequently detailed in a Record of Decision (ROD) (NYSDEC, March 2003). The RI indicated contamination of site soils and groundwater in isolated areas that resulted largely from bulk chemical and waste handling practices at the facility. These practices include: (1) historical leaks and spills (at least 17 incidents were reported between 1958 and 1994); (2) on-site waste disposal in pits excavated into native soils (the Resin Drum and Laminant Dust Landfills); and (3) the use of settling ponds (four settling lagoons were located throughout the site). In addition, a number of disposal pits were located inside plant buildings. These pits were cleaned during decommissioning activities following facility closure in 1992.

Spaulding completed a number of remedial activities over the years to address contamination at the site. The work included the following:

- In the late 1970s the four settling lagoons were excavated and backfilled with clean fill. The contaminated sludge and soils were reportedly disposed of at Seaway Landfill in Tonawanda, New York. These lagoons were utilized from 1930 to 1972 to collect and settle out wet grinding wastes.
- In August 1985 the Zinc Chloride Sludge and Drum Landfill (Site Number 915050D; delisted) was excavated. This area was a 60 cubic yard landfill located beneath the plant floor inside the main plant building and contained zinc chloride sludge contaminated with cadmium and lead, drummed lab chemicals and resin solvent mixtures. The pit was backfilled and a new concrete floor installed over it.
- In 1985 Spaulding removed lead contaminated zinc hydroxide sludge from the Zinc Hydroxide Sludge Storage Tank (SWMU 24). The sludge was disposed of at a permitted off-site secure landfill. The storage tank and surrounding area were decontaminated with high pressure water.
- In early 1993 Spaulding constructed an on-site water treatment system to treat PCB-contaminants in water from a basement sump, the on-site K-Line storm sewer and other wastewaters generated on-site. Periodic sampling and analysis of influent and effluent water was conducted to ensure compliance with discharge limits to the storm sewer. In June 1993 a portion of the on-site K-Line storm sewer was flushed and the sediments removed in accordance with a NYSDEC approved work plan. This work was completed following the detection of PCBs in the K-Line storm sewer sediments. The removed

sediments were dewatered, placed in roll-offs, and sent to Chemical Waste Management in Model City, New York for disposal.

- On October 21, 1994 it was discovered that an out-of-service transformer had been vandalized, resulting in a spill of PCB transformer oil. The transformer had been staged in a building pending off-site transfer for disposal. All visible fluids were immediately cleaned up by Spaulding personnel and the affected ground outside the building covered with plastic. This area was subsequently excavated, with the contaminated soils placed in roll-offs for off-site disposal. The floor was broken up, placed in roll-offs, and sent to Chemical Waste Management in Model City, New York for disposal.
- In 1995, Spaulding drained and dismantled the Therminol Unit which had been used as a heat exchanger for the Spauldite sheet presses. PCB oil had been released to the ground outside this building during use. A focused investigation of this area to delineate the horizontal and vertical extent of PCB contamination in subsurface soil around the Therminol Building was performed in 1995 and presented in an August 1996 report entitled: *PCB Soil Investigation Report, Therminol Building*. PCB-contaminated soil was later excavated by NYSDEC from this portion of the site as part of an Interim Remedial Measure (IRM).
- In January 2004 the NYSDEC began the remediation of Operable Unit 2 by excavating PCB contaminated soils. Approximately 6,800 tons of non-hazardous soils were transported to BFI in Niagara Falls, New York for disposal, while approximately 13,500 tons of hazardous soils were transported to CWM in Model City, New York for disposal.

Spaulding continued trying to sell the property in return for the remedial actions required at the Site. Attempts by Spaulding to sell the facility failed and in 2003 the United States Bankruptcy Court approved a recovery plan for Spaulding.

After Spaulding declared bankruptcy, NYSDEC continued environmental work to address hazardous waste sites under their Superfund Program. The NYSDEC Record of Decision (ROD) for the Site defined four Superfund Program operable units (OUs) requiring remediation based on the results of the RI and other investigations. The four Superfund operable units are shown on Figure 2 and are as follows:

- OU1: Regulated Landfill Wastes - SWMU 7 Resin Drum Landfill, SWMU 8 Laminant Dust Landfill.
- OU2: PCB-Contaminated Wastes - SWMU 11, 12, 13 Sludge Settling Ponds, SWMU 23 Former Tank Farm Area, SWMU 38 Therminol Building Area, AOC 48 Transformer Explosion Area.
- OU3: Petroleum Contaminated Wastes - SWMU 13 Former Grinding Oil Tank and Sludge Settling Pond (north), SWMU 36 Former Tank Farm Area.

- OU4: Multiple Contaminant Wastes - SWMU 3 Zinc Chloride Sludge Container Storage Area, SWMU 5 Empty Drum Storage Dock, SWMU 14 Sludge Settling Pond, SWMU 26 Paper Sludge Land Application Area, SWMU 35 Lab Waste Storage Area, AOC 45 Rail Spur, AOC 46 Drum Storage Dock, AOC 47 Bulk Chemical Unloading Area.

Subsequently, the Committee entered into NYSDEC's ERP to address site contamination outside of the Superfund areas and initiated demolition and restoration programs to return the site to productive use. To facilitate the ERP site investigation, three additional distinct OUs were defined at the site. Operable Unit 5 (OU5), the subject of this Work Plan, is the former parking lot on the east side of Wheeler Street, Operable Unit 6 (OU6) is the main plant operations area, and Operable Unit 7 (OU7) is the undeveloped western portion of the site. Operable Unit 7 was not part of Spaulding's manufacturing operation and showed no contamination exceeding applicable guidance values. Therefore, OU7 was addressed in a separate "No Action" Record of Decision (ROD) issued by NYSDEC on March 27, 2009. Operable Unit 5 was also unaffected by manufacturing operations, however, the fill material used as a subbase for the parking lot was found to contain contaminants in excess of applicable guidance values.

## **1.2 SI Results Summary**

### **1.2.1 Hydrology and Geology**

The elevation at the site is approximately 600 feet above mean sea level and the ground at OU5 and OU7 slopes gently to the north-northeast. Surface drainage is through a series of swales and ditches (the configuration of which has changed over the years) and storm sewers. Currently most surface water is collected through a drainage ditch present along the southern and western margin of OU6. The Niagara River is approximately one mile north of the site. The Niagara River and municipal water treatment and supply systems provide potable water to residents and industry in the vicinity and downgradient of the Site. The main plant floor is generally built at an elevation of just over 600 feet amsl, but many large pits and areas with multiple floor slabs are present.

The overburden of the region is primarily glacial in origin and consists of lake sediment deposits, sand and gravel deposits, and till. Fill and silty clay were the uppermost soil units observed during the SI. The stratigraphic units are as follows:

- Fill: Within the building footprint, fill generally consists of a black angular sandy material ranging in thickness from one (1) to ten (10) feet. The fill thickness outside the building footprint typically ranges from 0 to 2 feet. Previous investigators have reported fill up to 17 feet thick, however. The exterior fill primarily consists of reworked silty



clay with lesser amounts of sand and gravel. Concrete and brick fragments, crushed stone and cinders were encountered at several locations and at a lesser number of locations there were buttons mixed with cinders (button ash), wood debris and miscellaneous waste (i.e. plastic, litter, etc.) encountered, often mixed into the reworked silty clay.

- Glaciolacustrine silty clay: This unit consists primarily of reddish brown silty clay with thin interbeds containing sand/silt/clay. During the SI, this unit was observed in the field as characteristically dry to moist; however, the sandy layers were saturated locally. The sandy layers appeared to be discontinuous laterally. The thickness of this unit reportedly ranges from 36.4 to 45.8 feet thick across the site.
- Glacial till: This unit consists of dark reddish brown to gray, silty clay with abundant rock fragments and gravel. This unit reportedly ranges from 0 to 5 feet in thickness. The glacial till was not observed during the SI as the maximum boring depth was 29 feet below ground surface.
- Bedrock at the site was identified as dolomitic shale of the Camillus Formation. The depth to bedrock varies from 38.5 to 54.9 feet across the site and the uppermost bedrock consists of a 1.5 to 5-foot thick weathered zone. Below the weathered zone, numerous lightly to heavily-weathered shaly or gypsum-lined partings, rubble zones, and weathered gypsum and shale interbeds, along with weathered vertical fracturing, were recorded during the logging of previous investigation bedrock well cores. The Camillus Formation is a relatively transmissive aquifer. Groundwater flow in weathered bedrock appears to be northward to the Niagara River. Flow gradients below the weathered bedrock were undetermined due to the relatively flat nature of groundwater contours.

The Site-wide groundwater table was observed in overburden wells at elevations ranging from 606 feet amsl to 586 feet amsl. In the southern portion of the site, the measured groundwater elevation was as little as two feet below the ground surface, however, physical soil observations generally showed unsaturated (dry to moist) soil to a depth of four feet or more. The apparent groundwater flow direction is to the northeast and the observed horizontal hydraulic gradient is approximately 0.011 feet per foot. Slug testing has shown very low hydraulic conductivity results ( $10^{-7}$ –  $10^{-8}$  cm/sec) for the glacial water bearing unit. As noted above, much of the unit appears to be dry suggesting that groundwater primarily migrates through vertical cracks and sandy interbeds within the unit. Groundwater transmissivity and contaminant migration is

expected to be extremely limited in the glacial unit.

### **1.2.2 Standards, Criteria and Guidance**

Standards, Criteria and Guidance (SCGs) are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, or location. Guidance values include non-promulgated criteria and guidelines that are not legal requirements but should be considered if determined to be applicable to the Site. For the IRM, chemical-specific soil SCGs are based on 6 NYCRR Part 375 Soil Cleanup Objectives for restricted residential use, or, where Part 375 cleanup objectives are listed as NC (No Criteria), using the respective NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 soil cleanup guidance value. Table 1 presents chemical-specific SCGs for OU5.

### **1.2.3 OU5 Soil Contamination**

OU5 SI sampling included 22 test pits (TP-1 through TP-22) and 3 Geoprobe borings (71, 72, and 73). Supplemental SI sampling included 8 test pits. Sample locations are shown on Figure 3. No PID readings above background levels were detected at any OU5 sample locations. In general, a 4 to 12-inch layer of brown sandy organic topsoil was found in the test pits across the area. Asphalt pavement and/or asphalt millings were encountered in SI test pits TP-1, TP-5, TP-6, TP-7, TP-12, TP-13, TP-14, and TP-15 and Supplemental SI test pits in thicknesses of 8 to 18 inches. The presence of slag was observed at sample locations TP-14, TP-15, J-2, IJ-1 and IJ-2. Native glacial clay/silt was found from the bottom of the topsoil or asphalt fill to the bottom of the test pits which extended to a depth of up to 40 inches.

Seventeen OU5 SI soil samples and eight supplemental SI soil samples were selected for chemical analysis. Exceedances of applicable criteria are summarized in Table 2 and shown on Figure 3. Arsenic was detected in TP-13 (34.9 mg/Kg), TP-15 (41.4 mg/Kg), and I-2 (20.7 mg/Kg) at concentrations which exceeded the SCO for both Restricted-Residential (16 mg/Kg) and for Commercial (16 mg/Kg) land use. Subsequent Geoprobe sampling adjacent to TP-15 and Supplemental SI test pits showed an arsenic concentration which complied with the arsenic SCO. Exceedances of SCOs for Restricted-Residential land use were detected at 71.1 for Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene and Indeno(1,2,3-cd)pyrene. Supplemental SI sample location IJ-2 showed an SCO exceedance for Benzo(b)fluoranthene.

Low levels (relative to SCGs) of VOCs were also detected in OU5 soils. There were no

pesticides or PCBs detected at OU5.

## **2.0 INTERIM REMEDIAL MEASURE**

### **2.1 Summary of Environmental Concerns**

The anticipated redevelopment plan for OU5 is for commercial use such as an office building. LiRo completed a qualitative human health exposure assessment (EA) during the Site Investigation to evaluate the presence of completed or potential exposure pathways in order to determine if site contamination poses an existing or potential hazard to current or future site users. The EA identified the potential for human exposures, if any, associated with chemical constituents detected in soil, groundwater, and air at the Site.

Site investigation data indicate that Spaulding's historic chemical use/storage, operations, spills and disposal practices within and outside of the building released contaminants to the surrounding environment. OU5, however, was observed to be unaffected by plant operations. The use of historical fill material has impacted OU5. Chemicals of potential concern for soil at OU5 were identified based on exceedances of Site SCGs.

Under the current use scenario, trespassers on the site would have a potentially complete pathway through dermal contact or ingestion of contaminated soil. Nearby residents could potentially be exposed through inhalation from wind dispersion of fugitive dust from the site to offsite areas.

Under the future use scenario, trespassers on the Site would have a potentially complete pathway through dermal contact and ingestion of contaminated soil. Nearby residents could potentially be exposed through inhalation of wind dispersion of fugitive dust from the site to offsite areas.

Future site redevelopment construction workers and commercial site workers would have a potentially complete pathway through dermal contact and ingestion of contaminated soil, and inhalation of volatile contaminants through soil vapor intrusion into future structures.

Under the current and future use scenarios, groundwater is not known to be used or anticipated to be used as a potable water supply; therefore the groundwater ingestion exposure pathway is considered incomplete.

## **2.2 Remedial Goals**

The remedial action goal for the OU5 is to eliminate or mitigate all significant threats to human health and/or the environment, to the extent practicable, caused by contaminants present due to former Site activities. In order to meet this goal, remedial action objectives (RAOs) were established to protect human health and the environment, provide the basis for selecting appropriate technologies, and develop remedial alternatives. RAOs are based on contaminated media (soil, air/soil vapor, and groundwater), SCGs, and the results of the qualitative human health exposure assessment. Contaminated groundwater was not identified at OU5.

The remedial action objectives for OU5 soil are to:

- Eliminate or reduce to the extent practicable Site contamination sources that exceed soil SCGs.
- Eliminate or reduce the potential for exposure to contaminated Site soil.

The remedial action objective for air/soil vapor is to:

- Prevent or mitigate the potential for exposure to contaminated soil vapor and fugitive dust.
- Prevent or mitigate the potential for inhalation of volatile contaminants through soil vapor intrusion into future structures.

## **2.3 OU5 IRM – Area and Volume**

The remedial action objective for air/soil vapor with regards to exposure to contaminants present in soil vapor and fugitive dust would be met with soil remediation measures at the Site, since the source of contaminants in air, soil vapor and fugitive dust are due to site soil. Therefore, remediation area and volume pertain to contaminated soil within OU5 as described below:

### **Area I**

Area I showed Arsenic (As) concentrations exceeding criteria in shallow soil (less than 2 feet) at three locations. The elevated arsenic levels are attributed to the character of the fill used in this portion of the parking lot. Six to 18 inches of dark sand and asphalt subbase and/or asphalt millings were observed in Area I. The proposed IRM excavation area includes sample points I-1, I-2, and I-3, and TP-12, TP-13, and TP-14 to the top of native clay soil at an approximate depth of 2 feet.

### **Area J**

One Area J sample exceeded the arsenic criteria. The Area J exceedance is attributed to fill containing slag which was found to be present to a depth of 18 inches. The proposed IRM excavation area includes sample points J-1, J-2, and J-3 to the top of native clay soil at an approximate depth of 2 feet.

### **Area IJ**

Two Area IJ samples exceeded criteria for polycyclic aromatic hydrocarbons (PAHs). The contamination is attributed to slag and/or asphalt milling which was found to be present to a depth of 10 inches. The proposed IRM excavation area includes sample points IJ-1, IJ-2, and TP-5, TP-6, and TP-7 to the top of native clay soil at an approximate depth of 1 foot.

The proposed IRM excavation areas and volumes for OU5 (Areas I, J and IJ) are shown on Figure 4. The anticipated excavation volume for the combined OU5 Area is 3,486 cubic yards (cy). The objective of the IRM will be to remove arsenic- (Areas I and J) or PAH- (Area IJ) contaminated fill soil to the depth of the clay-silt native soil.

## **2.4 General Response Actions**

General response actions are broad categories of remedial actions capable of satisfying the RAOs for OU5. Some response actions are sufficiently broad to be able to satisfy all RAOs and meet SCGs for the site as a whole. Other response actions must be combined to satisfy RAOs for all impacted media. Remedial technologies were evaluated according to the general response actions of no action, institutional action, containment, source removal, and treatment. A brief description of the general response actions are as follows.

- **No Action** – No Action was evaluated as part of the process as a baseline alternative.
- **Institutional Action** - The Site would remain in its current state and controls implemented to reduce exposure to meet RAOs.
- **Containment** – Containment measures are those remedial actions whose purpose is to contain and/or isolate contaminants on the site. These measures provide protection to human health and the environment by reducing exposure or migration of contaminants, but do not treat or remove the contamination.

- **Source Removal** – Excavation of contaminated soil is a remedial action whose purpose is to remove contaminants from the site. Combined with offsite treatment and or disposal in an appropriate facility, source removal provides protection to human health and the environment by reducing exposure or migration of contaminants.
- **Treatment** – Treatment of contaminated media either above ground, or in the subsurface (in situ) is a remedial action whose purpose is to reduce the toxicity, mobility or volume of contaminants by directly altering, isolating, or destroying those contaminants through either biological, chemical, physical or thermal methods. Remaining contamination (residual) would no longer pose an unacceptable health risk.

## **2.5 Identification and Screening of Technologies**

This section identifies and provides a screening of remedial technologies for contaminated soil and air/soil vapor at OU5. Technologies are screened with respect to their relative effectiveness, implementability and relative cost.

### **2.5.1 Site Management Plan**

A Site Management Plan (SMP) would identify institutional controls and engineering controls (IC/EC) such as excavation protocols, in particular, procedures for soil characterization, handling, and health and safety measures to be undertaken during future onsite excavation activities for construction. These controls will mitigate potential exposures to contaminated soil and soil vapor, and identify the need for vapor intrusion monitoring and mitigation per NYSDOH air guidance for future structures.

**Effectiveness:** An SMP is an effective technology to mitigate potential human health exposures for current and future use scenarios.

**Implementability:** An SMP requiring long-term monitoring, and identifying necessary health and safety measures for future construction and soil vapor intrusion mitigation, due to residual contamination would be implementable at the Site.

**Cost:** The SMP would pose a relatively low cost as it would be consistent with the proposed future use of the Site.

**Summary:** A Site Management Plan will be retained for use at the Site.

### **2.5.2 Containment**

A newly-constructed cap covering the remediation areas would reduce infiltration from precipitation, and reduce contaminant leaching and subsequent migration to the groundwater system. Further, it would prevent the potential for exposure to contaminated soil, soil vapor and fugitive dust; however it would not be suitable for the proposed future use of the Site.

**Effectiveness:** Construction of a site cap would prevent the potential for exposure to contaminated soil, soil vapor and fugitive dust to nearby residents and limit precipitation infiltration to the subsurface. Cap technologies have been utilized at numerous remediation projects.

**Implementability:** A cap covering areas of contaminated surface soil would not be difficult to construct. However, a site cap would not be consistent with the future use of the Site.

**Cost:** The relative cost of a cap as compared to other remedial technologies would be low.

**Conclusion:** A cap is not retained for consideration since it would not be suitable for the future use of the site.

### **2.5.3 Excavation and Offsite Disposal/Treatment**

Excavating contaminated soil is a proven and reliable technology for contaminant removal. Contaminated soil would be excavated by conventional equipment and transported offsite either to an appropriate treatment facility or to a permitted disposal facility. Excavated soil would be subject to soil and waste characterization testing to identify whether it would require disposal in an appropriate landfill, or need transportation to a treatment (e.g., thermal desorption) facility. Given the relatively low levels of contaminants, and the results of soil sampling and analysis to date, it is anticipated that an offsite treatment facility would not be required.



**Effectiveness:** Excavation of contaminated soil and offsite disposal at a facility would be effective in removing the source of contamination and meeting the remedial action objectives for soil and air/soil vapor.

**Implementability:** This technology is widely used for remediation and would be implementable at the Site.

**Cost:** The cost of excavating contaminated soil to an appropriate depth using proper health and safety measures, and disposing the contaminated material offsite is considered to be moderate.

**Conclusion:** Excavation and offsite disposal of contaminated soil is an effective and implementable technology. It will be retained.

#### **2.5.4 In Situ Treatment**

In situ treatment technologies include biological and thermal processes designed to destroy contaminants, chemical/physical processes designed to increase the mobilization of contaminants, and stabilization/solidification processes that reduce the mobility of contaminants. Of these processes, in situ solidification (ISS) has been shown to be the most effective on contaminants present at the site. ISS introduces solidifying agents, such as cement, slag or kiln dust, or other proprietary reagents into subsurface soil to immobilize contaminants. Contaminants are immobilized primarily by binding the contaminants in a soil-cement mix and encapsulating contaminated soil with an impermeable coating. While the overall mass of contaminants is not reduced, contaminant mobility through soil vapor and fugitive dust, and the dissolution of contaminants to groundwater is prevented.

**Effectiveness:** Solidification is effective on a wide range of contaminants including organics and metals. This technology would be effective in reducing source and exposure pathways and the mobility of all site-related contaminants in soil. Long-term monitoring is required to evaluate the effectiveness. Bench-scale testing is necessary to develop a site-specific mix design which would effectively immobilize the site-specific contaminants.

**Implementability:** For shallow depths, in situ solidification can be conducted by mixing utilizing a backhoe bucket. An increase in the volume of the mixture will occur and require appropriate site grading and potentially some offsite disposal of swell material if onsite re-use is

not feasible. Contamination present in the subsurface may be released to the atmosphere during treatment; however, this can be managed with an air monitoring program and engineering controls. Implementation of this technology would require the removal of any asphalt and/or concrete within the remediation area.

**Cost:** The cost is considered to be moderate depending on the operation period and the amount of swell material which must be disposed offsite if an onsite re-use is not feasible.

**Conclusion:** While in situ solidification may be effective on site contaminants, its relative cost as compared to excavation and offsite disposal would not justify its use for the small volume of contaminated soil at this Site. It will not be retained.

### **2.5.5 Excavation and Ex Situ Treatment**

Utilizing this method, contaminated soil is excavated by conventional equipment, treated onsite above ground, and then replaced on the site if a site re-use is identified, or disposed of offsite if onsite re-use is not feasible.

**Effectiveness:** Ex situ solidification may be effective on metals and PAHs. Solidified material could be replaced on site, especially for use as fill material at depth. Bench-scale testing would be necessary to develop a site-specific mix design which would effectively immobilize the contaminants.

**Implementability:** Excavation and ex situ treatment through solidification would require multiple handlings of contaminated soil, first through excavation, second through treatment, and third through onsite backfilling. Adequate testing would be required to ascertain that cleanup objectives had been achieved before the treated soil was re-used onsite as fill material. This multi-staged approach would require a longer implementation time and additional measures to mitigate potential impacts to nearby receptors.

**Cost:** The relative cost of this technology is anticipated to be moderate to high.

**Conclusion:** While excavation and ex situ solidification may be effective on contaminants at the Site, its relative cost as compared to excavation and offsite disposal would not justify its use for the small volume of contaminated soil at this Site. It will not be retained.

### **2.5.6 Summary of Retained Technologies**

The following remedial technologies have been retained for use in the development of alternatives for OU5.

- No Action
- Site Management Plan
- Excavation and Offsite Disposal.

### **3.0 ALTERNATIVE DEVELOPMENT, EVALUATION, AND RECOMMENDATION**

Remedial technologies considered feasible for OU5 are combined into the following list of remedial alternatives which are described in detailed and subjected to an evaluation with respect to the criteria outlined in 6 NYCRR Part 375.

**Alternative 1** - No Action

**Alternative 2** - Institutional Controls

**Alternative 3** – Excavation and Offsite Disposal.

#### **3.1 Description of Alternatives**

##### **3.1.1 Alternative 1 – No Action**

Alternative 1 includes no remediation activities at the site.

##### **Size and Configuration**

- There are no remediation elements to the No Action alternative.

##### **Time for Remediation**

- There would be no time associated with this alternative.

##### **Spatial Requirements**

- There would be no spatial requirements for this alternative.

##### **Options for Disposal**

- There would be no disposal requirements for this alternative.

##### **Permit Requirements**

- There would be no permits required for this alternative.

##### **Limitations**

- The absence of remediation may impact future Site use.

##### **Impacts on Fish and Wildlife Resources**

- This alternative would not have an impact on fish and wildlife resources.

### **3.1.2 Alternative 2 – Institutional Controls**

Alternative 2 includes no remediation activities at the site. An SMP would be developed with institutional and engineering controls necessary for protection of human health and environment from contamination present at the Site.

#### **Size and Configuration**

- The SMP would be prepared by a professional engineer and include:
  1. environmental easements restricting the use and redevelopment of the site.
  2. controls and procedures necessary for soil characterization, handling, and health and safety measures, to manage residual risks present at the site including those related to contaminated soils that may be excavated from the site during future construction activities; and
  3. an evaluation of the potential need for vapor intrusion monitoring and mitigation per NYSDOH air guidance for future structures developed on the Site.

#### **Time for Remediation**

- The restrictions and controls of the SMP would continue indefinitely.

#### **Spatial Requirements**

- There would be no spatial requirements for this alternative.

#### **Options for Disposal**

- There would be no disposal requirements for this alternative.

#### **Permit Requirements**

- There would be no permits required for this alternative.

#### **Limitations**

- Restrictions within the SMP in the absence of remediation may impact future Site use.

#### **Impacts on Fish and Wildlife Resources**

- This alternative would not have an impact on fish and wildlife resources.

### **3.1.3 Alternative 3 – Excavation and Offsite Disposal**

Alternative 3 includes excavation of the identified remediation areas on Figure 4 to the indicated depths (i.e., 0-2'). An estimated 3,486 cy of soil would be excavated and transported offsite for disposal. Proposed excavations are relatively shallow (i.e., 0-2'). All asphalt and concrete encountered in the subsurface would be removed as part of the environmental remediation efforts. Verification samples would be collected within each excavation area. Excavated soil would be subject to waste characterization testing prior to offsite disposal.

#### **Size and Configuration**

- Alternative 3 includes excavation and offsite disposal of approximately 3,486 cy of contaminated soil.
- Additional fencing or site security will not be required during remediation.
- Air monitoring will be performed during remediation and personal protection equipment (PPE) levels may need to be upgraded based on action levels indicated within the Health and Safety Plan. For cost estimating purposes, it is assumed that all work will be performed using Level D PPE.
- It is assumed that due to the relatively shallow excavation depths required, minimal dewatering will be necessary. Water encountered during excavation, decontamination water, and any other water potentially contaminated will be collected and tested prior to discharge to the sewer system.
- Verification sampling within each excavation area will be conducted from excavation sidewalls and bottoms.
- Asphalt and concrete encountered during the course of environmental remediation will be removed to facilitate excavation activities.
- Excavated soil is assumed to contain relatively low levels of metals and PAHs. Disposal requirements will be determined based on waste characterization testing.
- Site restoration includes backfilling and re-grading, as necessary, with onsite (i.e., OU7 clayey silt) soil. At a minimum, the top 12 inches to finished grade will consist of soil.
- The surface will be seeded for erosion control.

#### **Time for Remediation**

- Construction is estimated to be completed in two weeks.

#### **Spatial Requirements**

- Adequate space is available onsite for construction equipment and necessary stockpiling.

## **Options for Disposal**

- Excavated soil and asphalt would be characterized prior to offsite disposal.

## **Permit Requirements**

- Permit requirements for offsite transportation and disposal would have to be met.

## **Limitations**

- Truck traffic on neighborhood roadways would have to be coordinated with the local community.

## **Impacts on Fish and Wildlife Resources**

- This alternative would not have an impact on fish and wildlife resources.

### **3.2 Description of Evaluation Criteria**

Each of the alternatives is subjected to a detailed evaluation with respect to the criteria outlined in 6 NYCRR Part 375 and described below. This evaluation aids in the selection process for remedial actions in New York State.

#### **3.2.1 Overall Protection of Public Health and the Environment**

This criterion is an assessment of whether the alternative meets requirements that are protective of human health and the environment. The overall assessment is based on a composite of factors assessed under other evaluation criteria, particularly long-term effectiveness and performance, short-term effectiveness, and compliance with SCGs. This evaluation focuses on how a specific alternative achieves protection over time and how site risks are reduced. The analysis includes how the source of contamination is to be eliminated, reduced, or controlled.

#### **3.2.2 Compliance with Standards, Criteria, and Guidance (SCGs)**

This criterion determines whether or not an alternative complies with applicable environmental laws and SCGs pertaining to site contaminants and location.

#### **3.2.3 Long-Term Effectiveness and Permanence**

This criterion addresses the performance of a remedial action in terms of its permanence and the

quantity/nature of waste or residuals remaining at the site after implementation. An evaluation is made on the extent and effectiveness of controls required to manage residuals remaining at the site and the operation and maintenance systems necessary for the remedy to remain effective.

#### **3.2.4 Reduction of Toxicity, Mobility or Volume with Treatment**

This criterion assesses the remedial alternative's use of technologies that permanently and significantly reduce contaminant toxicity, mobility, or volume (TMV) as their principal element. Preference is given to remedies that permanently and significantly reduce TMV.

#### **3.2.5 Short-Term Effectiveness**

This criterion assesses the effects of the alternative during the construction and implementation phases with respect to the effect on human health and the environment. Factors that are assessed include protection of the workers and the community during remedial action, environmental impacts that result from the remedial action, and the time required until the RAOs are achieved.

#### **3.2.6 Implementability**

This criterion addresses the technical and administrative feasibility of implementing the alternative and the availability of services and materials required including: the feasibility of construction and operation, the reliability of the technology, the ease of undertaking additional remedial action, monitoring considerations, activities needed to coordinate with regulatory agencies, availability of adequate equipment, services and materials, offsite treatment, and storage and disposal services.

#### **3.2.7 Cost**

Capital costs and OM&M costs (where applicable) are estimated for each alternative and presented on a present worth basis based on a 5% discount rate.

#### **3.2.8 Community and State Acceptance**

Concerns of the State and the Community will be addressed separately in accordance with the public participation program developed for this Site.



### **3.3 Detailed Analysis of Alternatives**

#### **3.3.1 Alternative 1 – No Action**

##### **Overall Protection of Public Health and the Environment**

Alternative 1 is not protective of human health or the environment.

##### **Compliance with Standards, Criteria, and Guidance (SCGs)**

Alternative 1 does not comply with the cleanup criteria developed for the Site.

##### **Long-Term Effectiveness and Permanence**

Alternative 1 is not an effective or permanent remedy for the contaminants present at the Site. Residual contamination would exist at current concentrations and levels.

##### **Reduction of Toxicity, Mobility or Volume with Treatment**

Alternative 1 does not reduce the toxicity, mobility or volume of contaminants present at the Site, except through natural attenuation processes.

##### **Short-Term Effectiveness**

Alternative 1 poses the fewest short term impacts to workers and the community from construction activities. RAOs will not be met.

##### **Implementability**

Alternative 1 would be the most implementable due to the lack of construction activities or controls.

##### **Cost**

There is no cost associated with the No Action alternative.

#### **3.3.2 Alternative 2 – Institutional Controls**

##### **Overall Protection of Public Health and the Environment**

Alternative 2 is not protective of human health or the environment except through institutional controls.

### **Compliance with Standards, Criteria, and Guidance (SCGs)**

Alternative 2 does not comply with the cleanup criteria developed for the Site.

### **Long-Term Effectiveness and Permanence**

Alternative 2 is not an effective or permanent remedy for contaminants present at the Site. Residual contamination would exist at current concentrations and levels. The SMP would include institutional and engineering controls to protect human health and the environment from future onsite activities.

### **Reduction of Toxicity, Mobility or Volume with Treatment**

Alternative 2 does not reduce the toxicity, mobility or volume of contaminants present at the Site, except through natural attenuation processes.

### **Short-Term Effectiveness**

Alternative 2 poses no short term impacts to workers and the community from construction. RAOs will not be met.

### **Implementability**

Alternative 2 would be implementable due to the lack of construction activities included, but institutional and engineering controls would be implemented following regulatory approval.

### **Cost**

The cost of the development of the Site Management Plan is estimated to be \$10,000.

## **3.3.3 Alternative 3 – Excavation and Offsite Disposal**

### **Overall Protection of Public Health and the Environment**

Alternative 3 is protective of human health and the environment and would meet SCGs for soil. There would be no residual contamination.

### **Compliance with Standards, Criteria, and Guidance (SCGs)**

Soil SCGs would be met following excavation and offsite disposal of soil exceeding criteria.

### **Long-Term Effectiveness and Permanence**

Excavating contaminated soil would be effective for the site-specific contaminants, and

permanent in the long term. Additional remedial measures would not be required at the Site.

### **Reduction of Toxicity, Mobility or Volume with Treatment**

Excavation and offsite disposal of contaminated soil would eliminate the volume of contaminants at the Site.

### **Short-Term Effectiveness**

Excavation of the small volume of contaminated soil would pose limited short-term impacts on workers, the nearby community, and the environment. Health and safety measures such as air monitoring, dust control, and erosion control would be necessary during construction to mitigate any impacts. The RAOs for soil to eliminate or reduce site contamination and the potential for exposure, and for air/soil vapor to prevent or mitigate the potential for exposure, would be met upon completion of excavation activities, anticipated to be two weeks.

### **Implementability**

Excavation with onsite re-use and offsite disposal are widely-used, conventional remedial technologies. Equipment and trained personnel should be readily available. Based upon previous sampling and analysis, excavated material should be classified as non-hazardous and acceptable to transport and dispose as non-hazardous material. Adequate health and safety measures must be undertaken for the proposed remediation which will occur adjacent to a residential neighborhood.

### **Cost**

The cost of Alternative 3 with excavation and offsite disposal is summarized on Table 3.

## **3.4 Comparative Analysis of Alternatives**

### **3.4.1 Overall Protection of Public Health and the Environment**

Alternative 3 provides the greatest overall protection to human health and the environment as contaminated soil is removed from the Site, meets soil SCGs, and the potential for exposure to contaminants present in soil and air/soil vapor is eliminated.

### **3.4.2 Compliance with Standards, Criteria, and Guidance (SCGs)**

Alternative 3 complies with soil SCGs since contaminated soil is excavated and removed from the Site.

### **3.4.3 Long-Term Effectiveness and Permanence**

Alternative 3 is the most effective and permanent alternative. It does not rely on institutional controls.

### **3.4.4 Reduction of Toxicity, Mobility or Volume with Treatment**

Alternative 3 eliminates the volume of contaminants at the Site.

### **3.4.5 Short-Term Effectiveness**

Alternative 3 poses the greatest short term impacts to workers, the community, and the environment. Adequate health and safety measures must be undertaken with Alternative 3 to monitor air, dust, control dust, and limit truck traffic. The RAOs for soil to eliminate or reduce the potential for exposure, and for air/soil vapor to prevent or mitigate the potential for exposure would be met upon completion of excavation activities with Alternative 3.

### **3.4.6 Implementability**

Alternative 1 would be the most implementable alternative, followed by Alternatives 2 and 3. However, due to the small volume of soil to be remediated, Alternative 3 is a readily implementable alternative.

### **3.4.7 Cost**

Alternative 1 has no cost associated with it. Alternative 2 has a cost of \$10,000. Alternative 3 has a capital cost of \$245,000.

## **3.5 Recommended Remedial Alternative**

Alternative 1, the No Action Alternative, and Alternative 2, Institutional Controls, were rejected because they do not provide protection to human health and the environment, do not meet SCGs, and do not satisfy RAOs.

Alternative 3 is protective of human health for current and future (both on-site and off-site) users

as well as the environment, meets SCGs, and results in no residual soil contamination. Alternative 3 meets RAOs for soil and air/soil vapor at OU5.

Alternative 3 – Excavation and Offsite Disposal is the recommended remedial alternative for OU5. This work can be conducted as an IRM in order to expedite site remediation. Following excavation and offsite disposal of the site contamination within OU5, long term institutional or engineering controls may not be required.

## **4.0 IRM METHODS AND SCHEDULE**

### **4.1 Excavation**

OU5 excavation work will be conducted using a grader/bulldozer or backhoe. Excavated soil will be characterized for landfill permit requirements and disposed of off-site. Prior to disposal, the soil will be staged either in roll-off boxes or in a polyethylene lined staging area.

Confirmatory excavation endpoint samples will be collected from the sidewalls and bottom of the excavation. Because of the shallow depth of excavation, the confirmation samples will be collected using dedicated, disposable polyethylene sample scoops. Sidewall confirmation samples will be collected from shallow depths containing any suspect millings or slag. Bottom samples will be collected from underlying native clay/silt soils. NYSDEC DER-10 Section 5.4 specifies excavation endpoint sampling for subsurface spills at a frequency of every 30 linear feet of perimeter. However, DER-10 recognizes that the sampling frequency may be reduced for larger excavations. In consideration of the anticipated size of the planned excavation (over 60,000 square feet), the absence of any spill source in OU5, a sampling frequency of one sidewall sample per every 100 feet of sidewall and one bottom sample per every 10,000 square feet of bottom should be protective of future site users and the environment. In a shallow excavation such as this, the character of any sidewall fill and the underlying native clay can be visually examined and sidewall/bottom sample locations will be biased toward areas of highest expected contamination as determined by visual evidence of fill characteristics, staining, odors, or photoionization detector (PID) readings. Confirmation samples from the northern portion of the excavation (i.e., Area IJ) will be analyzed for PAHs. Confirmation samples from the southern portion of the excavation will be analyzed for arsenic. Quality Assurance Project Plan (QAPP) requirements for the confirmation sampling are described in Section 4 of the Work Plan.

The excavation will remain open until confirmatory analysis results are returned and it is determined that endpoints comply with the site remedial objectives. Upon completion of the excavation work, final limits and final depths of the excavation will be surveyed as will the locations of all final confirmatory samples.

### **4.2 Off-Site Disposal**

The IRM Contractor has the responsibility of determining the means and methods of, and providing the labor, equipment, and materials necessary for transporting both solid and liquid waste materials from the Site to the off-site disposal facilities. All materials to be transported

off-site for disposal will have been properly characterized through visual observation and sampling and laboratory analysis for disposal purposes. All soil/fill excavated from the Site will be loaded into trucks for transport to the approved off-site disposal facilities. Disposal approvals will be obtained from the off-site facilities prior to transport.

Saturated soils will meet moisture content limits established by the disposal facility through either dewatering efforts or suitable admix material. Materials will be covered and conveyed during transportation in equipment that is properly designed, equipped, operated, and maintained to prevent leakage, spillage or airborne emissions during transport.

#### **4.3 Backfill, Re-grading and Restoration**

Once excavation is completed within each area, as evidenced by verification through confirmatory sampling and analysis, excavated areas will be backfilled and/or re-graded. On-site soil from clean borrow areas may be used as backfill and re-grading material provided it meets Part 375 restricted residential soil criteria. At a minimum, 1 sample will be collected:

- From each on-site borrow area.
- From every 500 cubic yards of backfill material

Re-grading may be performed in conjunction with, or in lieu of, backfilling using on-site soil from clean areas adjacent to excavation areas following confirmatory sampling and analysis of sidewall samples.

A demarcation layer in these shallow areas (above a depth of 2') of OU5 will not be required.

Excavated and re-graded areas within OU5 will be seeded for erosion control.

#### **4.4 Health and Safety**

The IRM work will be conducted in accordance with the Site-specific Health and Safety Plan (HASP) developed by LiRo for site investigation excavation work. The IRM Contractor conducting the site work will be required to develop a HASP as stringent as or more stringent than LiRo's HASP. A member of the field team will be designated to serve as the on-site Health and Safety Officer and will monitor Health and safety activities throughout the IRM program.

The HASP also includes a contingency plan that addresses potential site-specific emergencies, and a Community Air Monitoring Plan (CAMP) that describes required particulate and vapor monitoring to protect the neighboring community during intrusive site investigation/remediation

activities. The HASP and CAMP will be modified/expanded as appropriate to ensure that site remediation excavation activities are performed using procedures that are protective of site workers and the surrounding community. The CAMP will be consistent with the requirements for community air monitoring at remediation sites as established by the NYSDOH and NYSDEC.

#### **4.5 IRM Schedule**

Key milestones of the IRM schedule are detailed below:

- Complete Draft Plans and Specifications (4 wks) – Month 1
- Plan review and revisions (3 wks) – Month 2
- Issue bid documents (1 wk) – Month 2
- Bid period (3 wks) – Month 3
- Bid review and award (1 wk) – Month 3
- IRM site construction work – Month 4.



## **5.0 IRM REPORTING**

### **5.1 Construction Monitoring**

A LiRo Engineer or Scientist will be on-site on a full-time basis to document the IRM activities. Such documentation will include, at minimum, daily reports of IRM activities, community air monitoring results, photographs and sketches.

Standard daily reporting procedures will include preparation of a daily report and, when appropriate, problem identification and corrective measures reports. Information that may be included on the daily report form includes:

- Approximate verification sampling locations (sketches) and sample designations.
- Processes and locations of construction under way.
- Equipment and personnel working in the area, including subcontractors.
- Number and type of truckloads of soil/fill removed from the Site.
- On-site backfill and/or re-grading activities.
- A description of off-site materials received.

The completed reports will be submitted to the NYSDEC as part of the Final IRM Report. Photo documentation of the IRM activities will be prepared by the Engineer or Scientist throughout the duration of the project as necessary to convey typical work activities and whenever changed conditions or unexpected circumstances are encountered.

### **5.2 Closeout Report**

Details of completion of the IRM construction will be documented in an IRM Report submitted to the NYSDEC. The IRM Report will be stamped by a professional Engineer and will include (at a minimum):

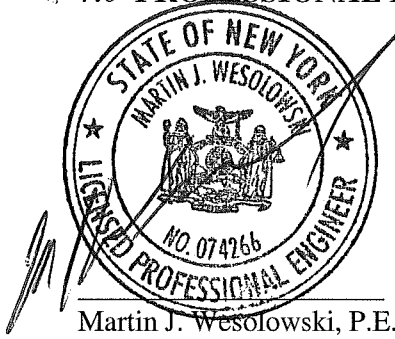
- Text describing the IRM activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that Site activities were carried out in accordance with this Work Plan.

- A Site map showing the remediated area including significant Site features including identification of backfill and re-graded areas.
- Tabular quantity summaries of: volume of soil/fill excavated; disposition of excavated soil/fill; and, volume/type/source of backfill.
- Tabular comparison of backfill and disposal characterization analytical results to SCGs.
- Map showing location of all confirmation and other sampling locations with sample identification.
- Tabular comparison of confirmation analytical results to SCGs.
- Documentation on the disposition of impacted soil removed from the Site.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Photo documentation of IRM activities.

## **6.0 QUALITY ASSURANCE PROJECT PLAN (QAPP)**

Quality assurance procedures for the IRM work and confirmation sampling will comply with the Spaulding Fibre Site Investigation QAPP prepared by LiRo (dated October 17, 2007). Table 4 specifies the anticipated sampling and analysis frequency and schedule for IRM confirmation sampling. NYSDEC Analytical Services Protocol (ASP) Category B data deliverables will be required for the IRM confirmation sampling.

## 7.0 PROFESSIONAL ENGINEER SIGNATURE



Martin J. Wesolowski, P.E.  
Project Engineer

## **TABLES AND FIGURES**

**TABLE 1**  
**CHEMICAL-SPECIFIC SCGs for OU5**  
**SPAULDING FIBRE SITE IRM**

<b>Compound</b>	<b>NYSDEC Part 375 Restricted Residential</b>	<b>NYSDEC TAGM 4046 Value</b>
<b>SVOCs</b>	Concentration in mg/kg	
Benzo[a]pyrene	1	NA
Benzo[a]anthracene	1	NA
Benzo[b]fluoranthene	1	NA
Benzo[k]fluoranthene	3.9	NA
Chrysene	3.9	NA
Dibenzo(a,h)anthracene	0.33	NA
Fluoranthene	100	NA
Indeno(1,2,3-cd)pyrene	0.5	NA
<b>Metals</b>	Concentration in mg/kg	
Arsenic	16	NA

Notes:

NA - Not applicable when there is a Part 375 criteria value

**Table 2**  
**Operable Unit 5**  
**Restricted Residential Soil Cleanup Objective Exceedances**  
**Page 1 of 1**

Sample ID	Contaminant	Concentration (mg/kg)	Criteria (mg/kg)
<b>SI</b>			
TP-13 (3"-12")	arsenic	34.9	16
TP-15 (0"-18")	arsenic	41.4	16
71.1 (0"-2")	Benzo(a)pyrene	47	1
	Benzo(a)anthracene	45	1
	Benzo(b)fluoranthene	68	1
	Benzo(k)fluoranthene	19	3.9
	Chrysene	59	3.9
	Dibenzo(a,h)anthracene	6.5	0.33
	Fluoranthene	110	100
	Indeno(1,2,3-cd)pyrene	26	0.5
<b>Supplemental Investigation</b>			
I-2 (0'-2')	arsenic	20.7	16
IJ-2 (0-6")	benzo(b)fluoranthene	1.1 J	1

**TABLE 3**  
**OU5 ALTERNATIVE 3 - EXCAVATION AND OFFSITE DISPOSAL**  
**CAPITAL COST ESTIMATE**  
**SPAULDING FIBRE**

ITEM NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	TOTAL COST
1	<b>Health and Safety Requirements</b>				
1a	On-site Health and Safety Officer	DAY	10	\$750	\$7,500
1b	Temporary Office	Month	0	\$1,000	\$0
1c	Personal Protective Equipment (PPE) Level D	Day	10	\$0	\$0
1d	Personal Air-Monitoring	Day	10	\$275	\$2,750
1e	Project Submittals (Utilities, Schedules, Survey, HASP)	LS	0	\$15,000	\$0
	<b>Item 1 subtotal</b>				<b>\$10,250</b>
2	<b>Excavation and Disposal/Treatment</b>				
3g	Excavation	CY	3,486	\$10	\$34,860
3i	Transport and Dispose of Non - Hazardous Contaminated Soils***	Tons	5,229	\$20	\$104,580
3j	Placement of on-site backfill, compaction and grading for soil excavation areas	CY	3,486	\$10	\$34,860
3m	Seeding	LS	1	\$500	\$500
3n	Dewatering during excavation (if necessary)	Gal	0	\$1.50	\$0
	<b>Item 2 subtotal</b>				<b>\$174,800</b>
3	<b>Environmental Consultant</b>				
3a	Air monitoring, material tracking during excavation, field oversight	Day	10	\$520	\$5,200
3b	Material sampling for disposal (Assume 1 test every 500 CY)	EA	8	\$585	\$4,680
3c	Verification sampling (sidewalls and bottom)	EA	15	\$585	\$8,775
	<b>Item 3 subtotal</b>				<b>\$18,655</b>
	<b>Capital Cost Subtotal</b>				<b>\$203,705</b>
	Contingency (10%)				\$20,371
	<b>Subtotal</b>				<b>\$224,076</b>
	Engineering Design				\$20,000
			<b>TOTAL</b>		<b>\$245,000</b>

Notes:

\*\* Excavation quantity is based on Figure 1.

\*\*\* Assume that excavated soil is 1.5 tons/cy; concrete is 1.8 tons/cy.

Unit costs for concrete and soil excavation and disposal are vendor quotes

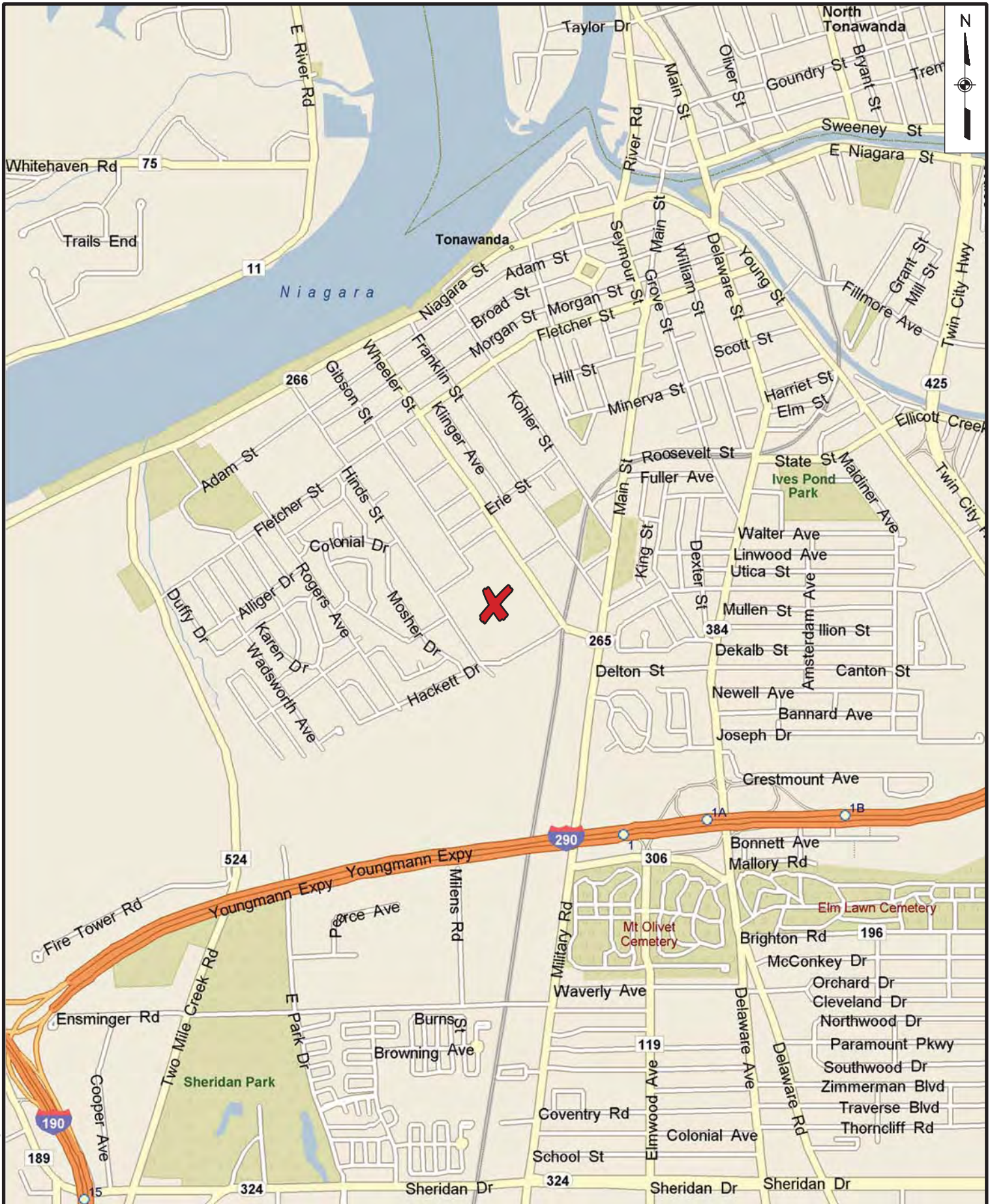


**TABLE 4**  
**SUMMARY OF OU5 CONFIRMATION SAMPLING**  
**SPAULDING FIBRE SITE IRM**

Remediation Area (Fig 4)	Anticipated Perimeter (LF)	# Sidewall Samples	Anticipated Bottom Area (Square Ft)	# Bottom Samples	Confirmation Analysis
Area I and Area J	960 ft	10	32,572	4	Arsenic (As)
Area IJ	660 ft	7	28,934	3	PAH

Notes:

PAH - polycyclic aromatic hydrocarbons, Method 8270



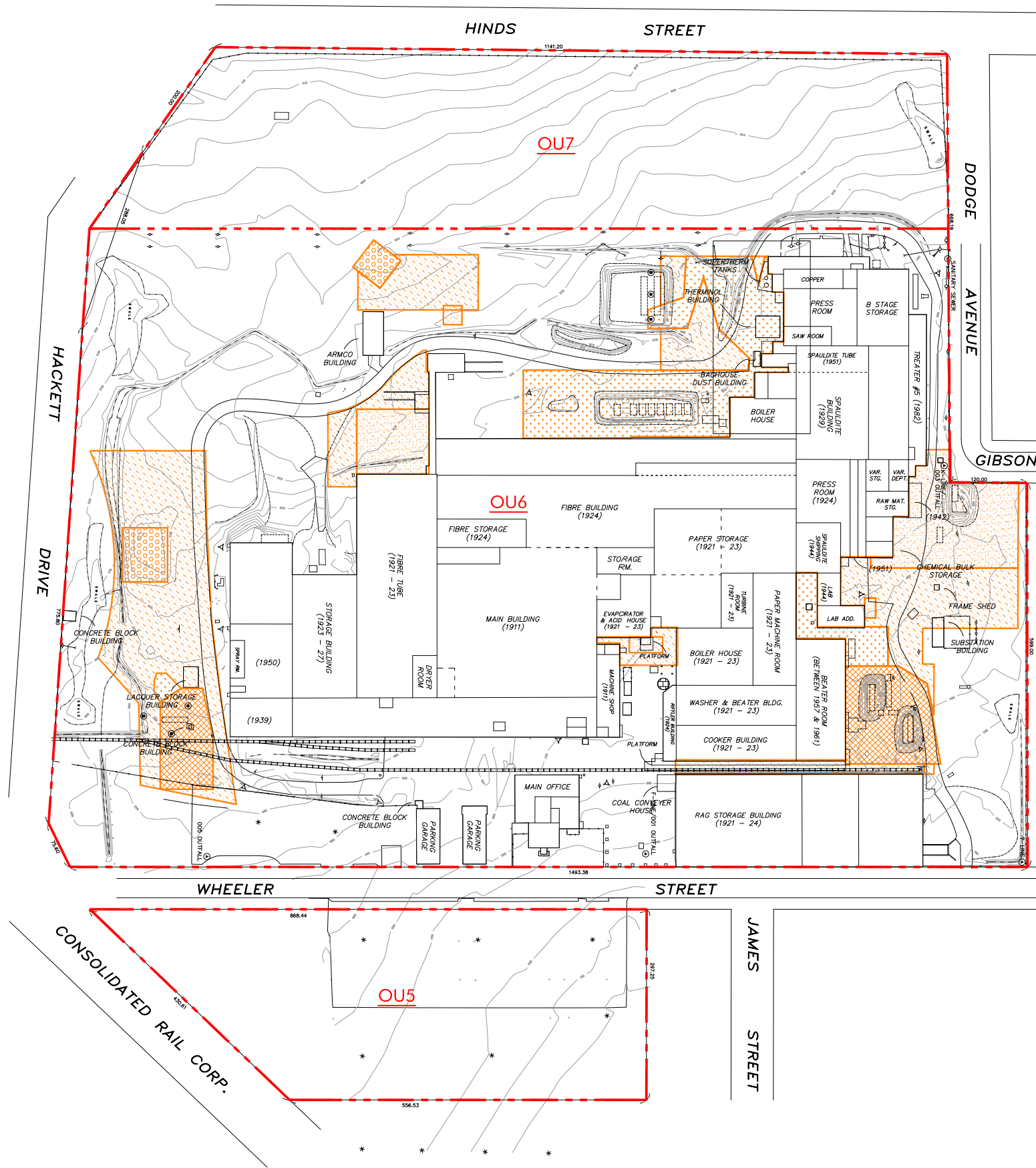
LiRo Engineers, Inc.  
690 Delaware Ave.  
Buffalo, NY 14209

## SPAULDING FIBRE SITE LOCATION MAP

FIGURE NO.

1





## LEGEND

- OU1: REGULATED WASTES  
(STATE SUPERFUND—EXCLUDED FROM PROJECT SCOPE)
- OU2: PCB CONTAMINATED WASTES — IRM AREAS  
(STATE SUPERFUND—EXCLUDED FROM PROJECT SCOPE)
- OU3: PETROLEUM CONTAMINATED WASTES  
(STATE SUPERFUND—EXCLUDED FROM PROJECT SCOPE)
- OU4: MULTIPLE CONTAMINANT WASTES  
(STATE SUPERFUND—EXCLUDED FROM PROJECT SCOPE)
- EXPANDED AREA OF CONTAMINATED WASTES  
(STATE SUPERFUND—EXCLUDED FROM PROJECT SCOPE)
- PROPERTY LIMIT/AREA DEMARCATION

100 0 100  
SCALE IN FEET

## WARNING

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REVISIONS		



PROJ. ENG.:  
DESIGNED BY:  
CHECKED BY:  
DRAWN BY:

CLIENT:

**ECIDA**  
(FOR THE SPAULDING FIBRE COMMITTEE)

DATE: MARCH 2009

SCALE: AS SHOWN

JOB TITLE AND LOCATION:

SPAULDING FIBRE IRM WORKPLAN

DRAWING TITLE:

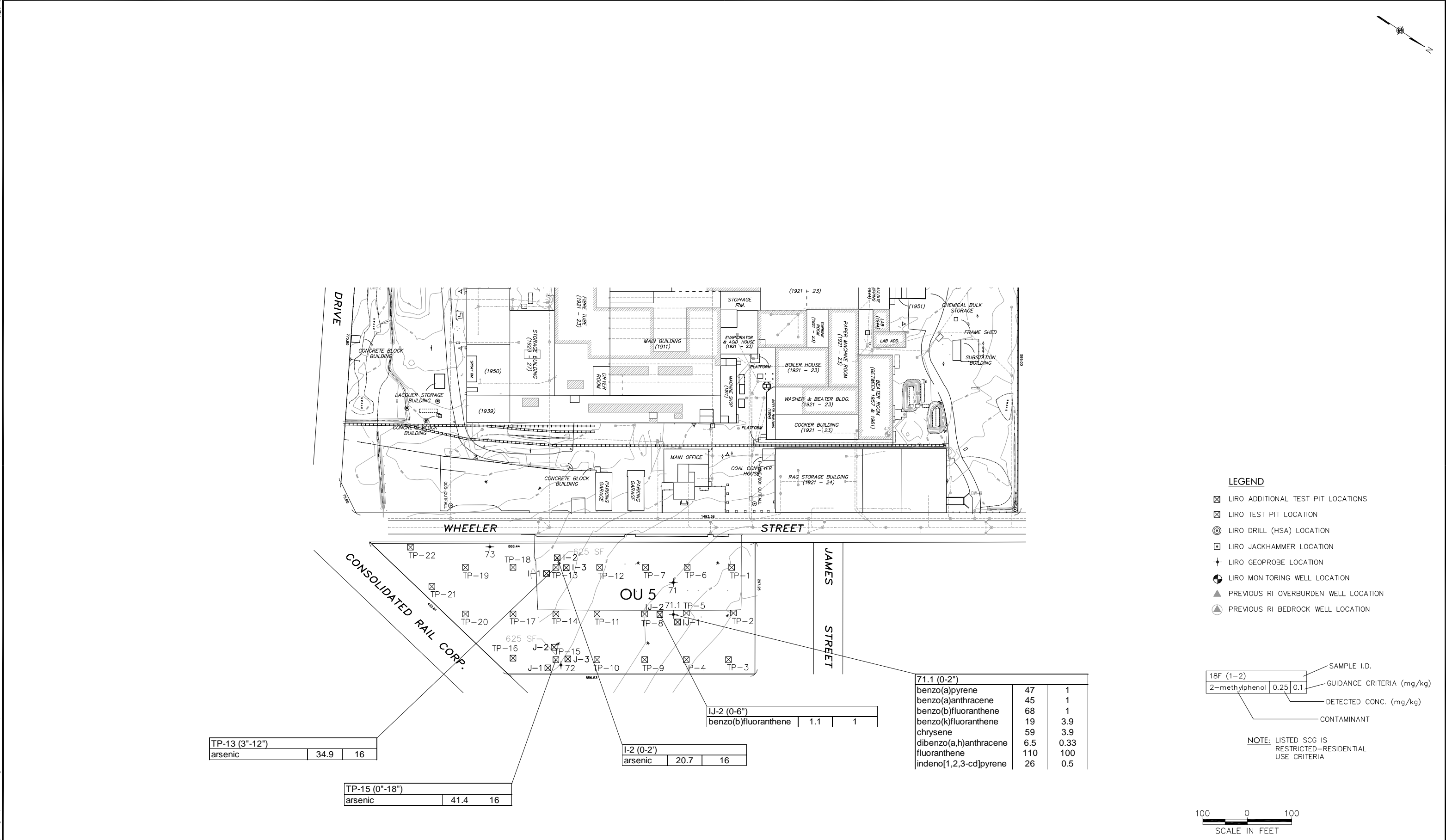
SITE PLAN

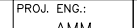
LIRO JOB NO.:  
07-25-306A

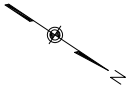
SHEET OF

FIGURE NO.

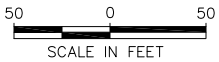
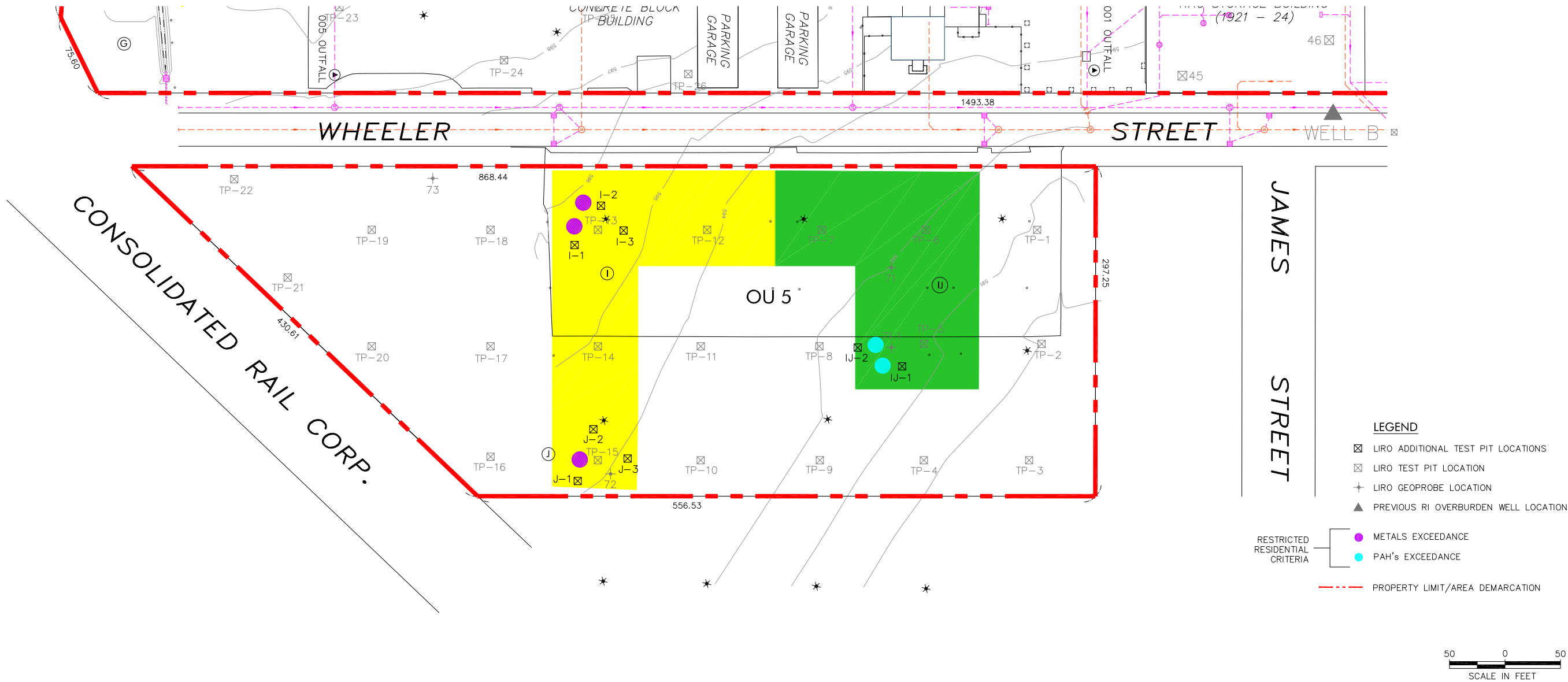
2



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								SHEET OF	
									FIGURE NO. 3
	NO.	DATE	DESCRIPTION			DRAWN BY: ES	DATE: MARCH 2009	SCALE: AS SHOWN	DRAWING TITLE: RESTRICTED-RESIDENTIAL EXCEEDANCES OPERABLE UNIT 5
REVISIONS									



SUPPLEMENTAL INVESTIGATION			
AREA ID	AREA (SF)	DEPTH (FT)	VOLUME (CY)
I	27,252	2	2,019
IJ	28,934	1	1,072
J	5,320	2	395
TOTAL VOLUME (CY)			3,486



WARNING

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NO.	DATE	DESCRIPTION
REVISIONS		



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DESIGNED BY:		
CHECKED BY: SF		
DRAWN BY: ES	DATE: MARCH 2009	SCALE: AS SHOWN

JOB TITLE AND LOCATION:  SPAULDING FIBRE IRM WORKPLAN	LIRO JOB NO.: 07-25-306A
DRAWING TITLE:  SAMPLE LOCATIONS AND REMEDIATION AREA	SHEET OF
	FIGURE NO. <b>4</b>