

Remedial Action Plan/Sampling and Analysis Plan for Voluntary Action at the Smile Learning Center near the MW Recycling, LLC Festus Site

Prepared for:

MW Recycling

5875 Landerbrook Drive
Mayfield Heights, Ohio 44124

Prepared by:

AMEC Environment & Infrastructure, Inc.
15933 Clayton Road, Suite 215
Ballwin, Missouri 63011



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ACRONYMS AND ABBREVIATIONS

cm centimeter
COC chain of custody
DHSS Department of Health and Senior Services
DQO data quality objectives
DU decision unit
EU exposure unit
HRS Hazard Ranking System
ICS incremental composite sampling
IDW investigation derived wastes
MDNR Missouri Department of Natural Resources
mg/kg milligrams per kilogram
PAH polycyclic aromatic hydrocarbons
PCB polychlorinated biphenyls
PBDE polychlorinated biphenyl ethers
PPE personal protection equipment
QAPP Quality Assurance Project Plan
RAL Removal Action Levels
RCRA Resource Conservation and Recovery Act
SAP Sampling and Analysis Plan
SU sampling unit
USEPA U.S. Environmental Protection Agency

1.0 Introduction

On behalf of MW Recycling, LLC, AMEC is submitting this Sampling and Analysis Plan (SAP) and Remedial Action Plan (RAP) for proposed voluntary soil sampling and remediation for the Smile Learning Center located at 1302 Kenner Street. This plan follows guidance the Missouri Department of Natural Resources (MDNR) has provided to AMEC and MW Recycling related to the residential lead soil remediation in Festus as well as guidance for this specific action. The scope of the AMEC investigation will include the remediation of impacted soils in focused locations and collection of post remediation soil samples.

2.0 Site Information

2.1 Site Location

The Smile Learning Center (hereafter referred to as the “Site”) is located a 1302 Kenner Street, approximately 200 feet east of the MW Recycling, LLC facility. The Site consists of an outdoor play area with lead soil remediation in the west portion of the Site (Figure 1). The outdoor play area consists of a pea gravel Sidewalk area along the north side of the Smile Learning Center building, the Play Ground containing play equipment, and Area 2 in southwest corner of the lot adjacent to the concrete pad. These three portions of the play area are shown in Figure 2.

2.2 Description

The Smile Learning Center is commercial property approximately 5200 square feet in size and is located approximately 200 feet east of the MW Recycling, LLC Festus yard, which has been used as a metal scrap processing and recycling facility since the 1940s. To the west and south of the Site, residential homes are located across Kenner Street and 13th Street respectively. To the north of the Site is a former gas station and the east is commercial property along Highway 61/67.

2.3 History/Contaminants of Concern

MDNR performed three (3) sampling events at the Site over a 15 day period from June 13 to June 28. On June 13, 2013, MDNR collected 1 soil sample at Smile Learning Center (Commercial Location ID # 405, no key provided but determined based on data provided) which MDNR reported a Decision Unit UCL of 870 mg/kg. In addition to that, MDNR reported that the fine particulate fraction of the pea gravel cover had an average lead concentration of 190 mg/Kg with a 95% upper confidence limit (UCL) of 330 mg/kg, which should result in the landfill accepting the pea gravel as general construction waste. On June 24, 2013, Department of Health and Senior Services personnel conducted dust wipe sampling on the floor inside the building and on exterior surfaces of the playground

equipment. All dust wipe results were below the HUD clearance criteria for indoor floors of 40ug/ft². On August 22, 2013, MDNR conducted soil sampling in four distinct areas on the property; the three discussed in Section 2.1 plus the narrow strip of soil located between the fence and the curb along Kenner Street. All four of these areas were found to contain mean lead concentrations above 400mg/kg. On August 22, 2013, AMEC with their contractor Environmental Restoration LLC conducted soil sampling in four distinct areas on the property; the three discussed in Section 2.1 plus the narrow strip of soil located between the fence and the curb along Kenner Street. Three of the four of these areas were found to contain mean lead concentrations less than 400mg/kg. The Play Ground, Sidewalk and curb surface had concentrations of lead that were 267 mg/kg, 253 mg/kg and 331 kg/kg respectively. The only result that was greater than 400 mg/kg was the result for the curb core which exhibited a positive XRF result for lead at 477 mg/kg.

3.0 DATA QUALITY OBJECTIVES

To help ensure precise, accurate, representative, complete, and comparable data, all field work and analyses will be conducted in general accordance with the approved Residential QAPP included as an appendix to this RAP/SAP, when published. The sampling design used to document the effectiveness of the soil remediation effort at the site will conform with that described in the MDNR Integrated Site Inspection/Removal Site Evaluation Sampling and Analysis Plan to ensure compatibility with data previously generated by MDNR in April 2012.

3.1 Conceptual Site Model and Goal

Based on review of the data from the Site, lead will be the only contaminant of concern. MDNR has indicated that lead-contaminated soil (>400 mg/kg) exists beneath the porous pea gravel cover in all portions of the outdoor play area plus in the area between the fence and the curb. The area between the fence and the curb does not present an exposure issue and therefore, is not included in the Site remediation. The goal of the RAP/SAP is to remove the pea gravel from the Site and replace it with new pea gravel, remove lead contaminated soil in the children's play area in 6" lifts up to one (1) foot beneath ground surface (bgs), perform soil screening/sampling to document performance standards are achieved (<400 mg/kg), and to replace impacted soil with borrow source material (<100 mg/kg lead containing material).

3.2 Study Boundary

Figure 2 shows the three portions of the play area targeted for cleanup as part of this removal activity; pea gravel Sidewalk area, pea gravel Play Ground Area and pea gravel Area 2. Please note that Area 2 will receive a concrete cap after soil removal activities are completed per Section 4.0.

3.3 Field Decontamination

The cleaning of remedial equipment such as Bobcat's™, shovels, tillers, and hand tools will be performed prior to remediation activities, prior to the placement of borrow material and before the equipment is removed from the site. Details on decontamination procedures are provided in the QAPP, but generally would adhere to the following guidelines:

- Scraping with putty knife or similar tool to remove soil clumps;
- Brushing with stiff-bristle nylon brush to remove visible soil debris;
- Immersion (if practical) in a 5-gallon bucket of soapy water and further brushing;
- Rinsing tool with deionized water; and
- Wiping dry with clean paper towels.

3.4 Quality Assurance/Quality Control Samples

The following samples will be collected as part of the quality control/quality assurance procedures for the investigation.

3.4.1 Equipment Rinsate Blank

An equipment rinsate blank will be collected prior to initial work startup and prior to demobilization. Following decontamination of the equipment/tool, deionized water will be rinsed over the core cylinder and into a sample container, properly preserved with nitric acid in an 8 oz plastic or 250 mL glass bottle, and will travel with the other samples back to the laboratory for analysis.

3.4.2 Laboratory QC

Laboratory precision and accuracy will be assessed as described in the QAPP by a laboratory that has been selected and is an approved National Environmental Laboratory Accreditation Program (NELAP) per the Site specific QAPP.

4.0 Field Activities

Based on the results of the previous sampling activities, lead impacted areas greater than 400 mg/kg in the children's play area at the Site will follow these remediation goals with performance standards. The performance standards shall mean the cleanup levels (400 mg/kg) shall be attained by the general provisions outlined below:

- Use safety barriers, barrier tape, etc., to demarcate the work area to prevent public access;
- Stage roll-off containers within the exclusion zone;
- Temporarily remove a portion(s) of the south wooden fence;
- All outdoor gym equipment will be wiped down prior to being disassembled and pre-cleaned to insure that cross contamination of the Site warehouse

facility does not occur. The clean equipment will be reassembled after the soil remediation;

- Disassemble and remove the existing gym structure, play equipment, etc. to the locked rear warehouse area of Smile Learning Center. Once the equipment is locked in the building, the door, overhead garage door, and side doors (2) will be sealed with visquene and duct tape prior to the start of remediation activities in the morning and removed at the conclusion of remediation activities prior to the arrival of children in the morning;
- Remove the pea gravel utilizing a small, mechanized front loader (i.e., Bobcat™) in accessible areas and by hand/wheelbarrow methods within inaccessible areas. Previous sampling characterized the pea gravel as containing less than 400 ppm lead. The pea gravel will be placed in roll-offs, removed as construction waste (if acceptable by landfill) and disposed in a sanitary landfill.
- Remove the top 6" of soil in the lead impacted zone (immediately beneath the pea gravel and landscaping fabric) and after removal, acquire XRF readings for the measurement of potential lead impact on the soil floor.
- 15- in-situ XRF readings will be collected equally-spaced across the floor of each excavated portion of the play area. If the average in-situ XRF readings in the soils floor for each area are less than 400 mg/kg, then clean borrow soil and new pea gravel cover will be added to the area to bring the ground surface of the excavated area back to it's original elevation.
- If the average in situ XRF readings in the soil floor of an excavated area are greater than 400 mg/kg, then another 6" lift of impacted soil will be removed from the lead-impacted excavation area. If average in-situ XRF readings in the soils floor are less than 400 mg/kg, then clean borrow soil/pea gravel will be added to the area to bring the ground surface of the lead-impacted excavation area to it's original elevation.
- If average in-situ XRF readings are still greater than 400 mg/kg at the depth of 12" below ground surface (bgs), the performance standard will be met and no further excavation will be required.
- In those area(s) where average in-situ XRF readings are greater than 400 mg/kg at 12" bgs, a witness barrier (i.e. an orange snow fence barrier) will be laid down to identify the extent and vertical boundary of excavated lead-impacted materials for future soil removal activities. Clean borrow soil, defined as borrow source soil with an average lead concentration (as measured by a NELAP approved laboratory) less than 100 mg/kg, will be added to the area to bring the ground surface within three to four inches of the yard. New, clean pea gravel will be added to bring the final grade to the surface of the surrounding yard surface. Approximately 1 soil sample for every 500 cubic yards of borrow fill will be analyzed for Lead, (EPA Method 6010C). This sample will be a composite consisting of 30 increments of soil collected from throughout the fill material.

- If the average in-situ post-excavation soil samples indicate that the mean lead concentration in remaining soil will exceed the EPA remediation action level of 400 ppm, MW Recycling may request the Owner to execute an Environmental Covenant pursuant to the Missouri Environmental Covenants Act. Whether or not the Owner executes an Environmental Covenant, MW Recycling will not undertake any additional action.
- Following excavation and confirmation sampling, the property owner intends to install a concrete surface in the southwest corner portion identified as pea gravel Area 2 as shown in Figure 2. No new pea gravel will be installed in this area and the area will be left in condition ready to receive concrete by the Site owner following this removal action.
- Once borrow material/pea gravel is placed back in the excavation, the gym structure re-assembled, fence reinstalled and barriers/barrier tape removed. Vertical structures (building) in close proximity to the removal area will also be wet wiped as appropriate.

All soil removal, sample locations, descriptions, and field notes will be recorded on field sample collection forms, with a blank field sample collection form included in Appendix B of the QAPP.

Site sketches and in-situ XRF readings will be recorded on the field sample collection form (Appendix B), and all samples collected will be recorded on chain of custody forms (Appendix C, as an addendum to this Plan after a NELAP Laboratory is chosen). The sample locations will be recorded with geospatial software, and photographs will be taken to document the sampling event. All photographs will be recorded and labelled in a photographic log.

4.1 Sampling During Excavation

The XRF analyzer will be calibrated and standardized per the manufacturer's instruction. Known reference standards containing certified concentrations of lead at various levels will be analyzed prior to initiating field work. Results will be documented on an XRF data field sheet for each residence. The serial number of the analyzer(s) used will be noted on the field sheet. Prior to XRF analysis, the Location ID and analyst will be entered into the XRF analyzer. Excessive soil moisture interferes with XRF. If soil conditions are saturated (>25% moisture), in-situ XRF analyses will not be conducted and field work will stop until conditions are dry enough for work to commence onsite.

15- in-situ XRF readings will be collected equally-spaced across the floor within each of the three (3) excavation areas.. The results will be recorded on the field sheet, and the averages for each excavation area will be calculated.

In-situ XRF precision will be evaluated once per day per XRF analyzer by collecting seven replicate XRF readings at a single location without moving the analyzer. The XRF data will

be downloaded from each analyzer upon returning from the field and will be QC-checked and validated.

4.2 Post-Excavation Sampling

One 30-increment ISM sample per excavation area will be collected from the floor of excavated areas, prior to placement of the witness barrier (if necessary) and the clean soil cap/pea gravel to document the lead levels remaining beneath the soil cap. Analysis of the soils will be as follows (see Page 5, Section 4.0, 3rd bullet of page):

- Total Lead (EPA Method 6010)

4.3 General Remediation Procedures and Guidance

The excavation of lead-impacted soils to facilitate a clean soil cap have been developed in general accordance with the EPA Superfund Lead-Contaminated Residential Site Handbook, August 2003. No changes related to the foundations of built structures or flatwork (sidewalks and driveways) within the Site will occur. No new structures will be constructed. All Procedures and Guidance apply, where applicable.

1. A clean soil cap will be placed over the play areas as described above. The current structures (driveways, sidewalks, and other impenetrable hardscape) will remain in place. Excavations shall start adjacent to all concrete sidewalks, walkways, drives, and other structures and shall extend to the extent of the play area. All excavations that start adjacent to all concrete sidewalks, walkways, drives, and other structures will be excavated by hand as deep and SAFELY as possible and will only employ mechanical means when it is determined by the Site Manager that a safe distance from the concrete structures has been achieved as not to impact the structural integrity or physical appearance of such structures.
2. A qualified and licensed lead remediation contractor (Remediation Contractor) will be contracted to provide all labor, materials, services and equipment necessary for the excavation, relocation, and/or off-site disposal of impacted soil.
3. AMEC will oversee and manage the implementation of the remedial action plan. AMEC will be present during excavation, backfilling and restoration activities in order to closely monitor the work being performed.
4. If applicable, it is currently assumed that all shrubs and bushes will need to be removed and properly disposed offsite. Larger trees will remain in-place undisturbed.
5. Once the excavated material is ready for off-site disposal, the excavated material shall be loaded, hauled, and properly disposed of at a permitted waste disposal facility.
6. When possible, excavated impacted soil will be placed directly into a licensed special waste hauler's trucks or roll-off box. Excess soil and debris will be removed from the

sides of the vehicle, wheels and undercarriage prior to leaving the Site. The load will be transported directly to an approved sanitary landfill permitted to accept special waste. The waste hauler will be required to cover all loads of lead-impacted soil leaving the Site and will be required to ensure that no soil is spilled onto public rights-of-way. As noted above, the pea gravel cover material will be removed and disposed in a sanitary landfill as routine solid waste, if accepted by the landfill as such.

7. Based on the results of testing at the Site, the Contractor may assume that the excavated materials can be handled and disposed as a non-hazardous special waste. The landfill facility shall be permitted by the State of Missouri or Illinois to accept such material. The Contractor will be required to provide documentation of the anticipated landfill with their bid. All truckloads of material shall be properly manifested.
8. If required by the landfill disposal facility, additional samples needed for landfill characterization purposes depending on disposal facility requirements will be collected.
9. Temporary stockpiling of soils may be required. On-site storage methods will consist of stockpiling on 10-mil minimum polyethylene sheeting and securely covered in the same in a manner that will minimize access to the soil and prevent any precipitation infiltration or leaching.
10. If groundwater should be encountered during excavation or if a significant precipitation event should occur during excavation which requires the removal of the water, the water will be sampled and characterized in order to determine appropriate handling and disposal alternatives. Excavations will be conducted in a manner which minimizes the potential for surface run-off. Based on the shallow depths of the excavation, groundwater is not anticipated to be encountered.
11. Project activities requiring the disturbance of the impacted soils will be conducted in a manner that minimizes the potential for airborne lead emissions. Engineering controls will be implemented to minimize the potential for airborne lead emissions. The primary technique will consist of misting the exposed fill material areas with a fine water spray throughout the duration of the project. The misting will not be excessive as to create any surface run-off. If periods of high winds persist that render dust suppressant techniques ineffective, project activities will be temporarily suspended. Perimeter dust particulate monitoring will be performed to document effective dust control measures are employed throughout the duration of the project.
12. Fugitive dust emissions will be monitored in-the-field using a Total Suspended Particulate counter, such as a MiniRam or equivalent instrument. The site-specific action level will be determined by calculating the maximum amount of particulates that can be in the air without exceeding the National Ambient Air Quality Standard (NAAQS) for lead of 0.15 ug/cubic meter measured as an eight-hour Time Weighted Average. A MiniRam or equivalent will provide real-time data, and allow for immediate corrective actions if necessary to adequately protect residents and the general public from the hazards of lead contaminated suspended dusts. If the action level is exceeded, additional engineering controls will be implemented.

13. Throughout the duration of the project, the initial level of safety is assumed to be Level D Modified. Level D Modified protective equipment shall consist of hardhats, coveralls, gloves and boots/shoes (leather or chemical resistant) with steel toe and shank.
14. Tools, machinery, vehicles or other equipment used on Site that comes into direct contact with lead-impacted soils will be wiped clean of any excessive soil or debris upon completion of work activities, prior to the placement of borrow material and prior to leaving the Site. Any resulting lead-impacted soil and debris will be segregated, contained and characterized in order to determine appropriate disposal alternatives. If washing, rinsing or steam cleaning of equipment is deemed necessary, the rinsates will be contained and characterized in order to determine appropriate disposal alternatives.
15. A Site Health and Safety Plan will be developed that addresses all applicable safety precautions associated with the project. All safety precautions in accordance with the project specific Site Health and Safety Plan will be followed during excavation activities.
16. All work shall be performed in a manner that minimizes transfer of lead-impacted soils beyond the excavation areas. Cleanup of any soils or debris that may collect on adjoining surface areas including, but not necessarily limited to, driveways, patios, sidewalks or public right-of-ways will be performed.

4.4 Soil Cap (Backfill) and Witness Barrier

- 1) Backfilling with borrow fill will commence as soon as possible following removal of impacted soils. Exposed excavations will not be allowed more than 24 hours in duration without prior permission from the Owner. In the event the excavation is exposed for a period greater than 24 hours, the excavation will be cordoned off with orange construction fencing and notifications.
- 2) If the mean lead concentration in excavation floor in any portion of the play area exceeds 400 mg/kg as determined through incremental composite sampling and in-situ XRF analysis, a witness barrier, consisting of orange-mesh plastic webbing will be placed upon completion of excavation and relocation of soils. The fabric will cover the entire excavation not already covered by impermeable surfaces including excavation areas, on-site relocation areas, and areas that will have only the clean soil cap. The cloth will be rolled into place, overlapped at the edges, and anchored into position.
- 3) Backfilling will start adjacent to all concrete sidewalks, walkways, drives, and build structures and shall extend to the excavation boundary, where/when applicable.
- 4) The soil barrier cap shall be a minimum of 6 inches compacted in thickness and after compensating for settling, shall return the Site grade to its previous state in areas around existing structures.
- 5) The fill material used for the barrier soil cap shall come from a clean fill source, and be capable of compaction. The fill material will be free of large rocks, debris,

vegetation, and dirt clumps. The source of the fill material has not been determined. Written documentation will be provided of the source of the clean fill and proof by laboratory analysis. If another fill source is utilized, the frequency and type of analysis required may vary depending upon the source of the fill material and heterogeneous nature of the material. Laboratory analysis will generally be provided on a frequency as follows:

- Approximately 1 soil sample for every 500 cubic yards of borrow fill will be analyzed for Lead, (EPA Method 6010C). This sample will be a composite consisting of 30 increments of soil collected from throughout the fill material.

The backfill will be placed in a manner that is consistent with Site grading plans and should provide for slopes away from building(s).

- 6) Compaction will be performed by tracking and tamping with hand equipment that will effectively eliminate the potential for future settling of materials.
- 7) Fugitive dust control measures will be taken to ensure fugitive dust does not leave the remediation area. If fugitive dust is noted outside the remediation area as designated by MW Recycling, measures will be taken to control the dust.

4.5 Contractor Requirements and O&M Plan

- 1) All work shall be performed in accordance with the project specific OSHA compliant Site Health and Safety Plan in accordance with all applicable local, state and federal laws and regulations.
- 2) To limit access to the Site during project activities, the Remediation Contractor may be required to secure the Site including appropriate fencing (e.g. plastic orange fencing) and warning signs prepared in number and content satisfactory to AMEC placed at regular intervals along the work area perimeter.
- 3) Prior to initiating field activities, the Contractor will be required to furnish the following information:
 - a) Work plan summary describing the manner in which the project will be completed.
 - b) List of all equipment to be used on the project.
 - c) List of off-site disposal facilities to be used.
 - d) List of workers including name, length of service with the company and evidence of participation in a 40-hour Personnel Protection and Safety Course which meets the requirements of Title 29 Code of Federal Regulations (CFR) Section 1910.120 - Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response Standard. The workers used on the project shall be skilled and experienced as evidenced by participation in at least two environmental remediation projects of similar scope and scale.

- e) Site specific health and safety plan.
- f) Copies of all necessary permits, insurance certificates, worker certifications, waste hauler certifications and the designated off-site disposal facility.
- g) Solid waste handling, characterization, disposal plan.
- h) The remediation contractor will be responsible for notifying the Missouri One Call System prior to any excavation.

5.0 Sample Collection

5.1 Post-Excavation Confirmation Sampling

As described above in-situ XRF analysis will be used to document the mean lead concentration in soil remaining on the excavation floor after soil removal. Following excavation of each sub-portion of the play area, 15 in-situ XRF readings will be collected at the surface of the excavation floor from evenly-spaced locations. The mean will be calculated from these 15 readings and used for decision-making as described above.

5.2 Clean Fill Sampling

One sample will be collected from the clean fill material to demonstrate the at the mean lead concentration does not exceed 100 mg/kg. This sample will be a composite consisting of 30 increments collected from throughout the volume of clean fill.

5.3 Number of Samples, and Container and Preservation

The one clean fill sample will be collected in a certified clean container and submitted to an approved laboratory for lead analysis by USEPA SW-846 Method 6010B. Refer to Table 1 for container and preservation requirements.

**Table 1
 Preservation Methods**

Soil Samples			
Parameters	Container(s)/Volume	Preservative(s)	Holding Time
Total Metals (Pb)	One or more 8-oz glass jars or a 1-gallon resealable baggie	Cool, 2°C	6 months

5.4 Chain-of-Custody

The ICS soil samples will be stored in the plastic bags in which they were collected. Each bag will be labelled with a unique DU identifier, date, collector initials, and depth using permanent marker. The samples will be recorded on a separate chain of custody (COC) form (Appendix C). The samples will remain in the custody of AMEC field personnel during sample processing and XRF analysis. Those samples identified for laboratory analysis will be placed into appropriate sample containers and entered onto an NELAP Laboratory Approved COC form to be relinquished to a of sample custodian at the environmental laboratory for analysis. Samples remaining at AMEC for ex-situ analysis will have the COCs completed by AMEC personnel.

Field personnel will attempt to return unused soils to their source immediately after generation. Disposable PPE and disposable sampling equipment will generally be handled as solid waste, containerized, and properly disposed. Wash and rinse waters generated during equipment decontamination will be discharged to the wheel washing station at the MW Recycling, LLC facility.

6.0 Investigation Derived Waste (IDW) Plan

Efforts will be made to minimize IDW generation. The IDW may include soil, sediment, decontamination fluids, disposable sampling equipment, and disposable personal protective equipment (PPE).

7.0 Site Safety

A safety tail-gate briefing will be held on-site prior to initiating field activities and field personnel will be required to read and sign the site-specific health and safety plan.

8.0 Reporting

Pace will provide a copy of the chain of custodies and laboratory result sheets. AMEC will prepare an Investigation Report for the additional sampling results.

9.0 References

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- MDNR, 2012. Missouri Department of Natural Resources, Data from January 2012 Sampling Event (not yet published).
- NPN, 2011. Letter to Mr. Greg Shapiro, MW Recycling, LLC/MW Recycling, from David B. Rowe, NPN Environmental, December 12, 2011.
- USEPA, 1990. U.S. Environmental Protection Agency Hazard Ranking System, 40 CFR Part 300, Appendix A, 55 FR 51583, December 14, 1990, <http://www.thefederalregister.com/d.p/2007-05-25-E7-10055>.
- USEPA, 1992. U.S. Environmental Protection Agency Hazard Ranking System Guidance Manual, EPA/540/R-92/026, November, 1992. <http://www.epa.gov/superfund/sites/npl/hrsres/index.htm>

Appendix A

	Employee Health and Safety Policy Manual	Procedure #:	HS-25
		Page:	1 of 4
	Subject: X-Ray Radiation Protection Program	Revision:	02
		Issue Date:	March 18, 2011

1. Purpose

The purpose of this Radiation Protection Program (RPP) is to keep radiation exposures to workers using a portable, X-Ray Tube based Thermo NITON Analyzer XL3t at Environmental Restoration to levels that are as low as reasonably achievable (ALARA), and

Ensure that use of the NITON Analyzers is in compliance with all applicable State and Federal regulations.

2. Scope

This RPP applies to any use of NITON Analyzers at Environmental Restoration, LLC.

3. Responsibilities

Luke Wisniewski shall be designated as the individual in charge of the RPP. Luke Wisniewski will be responsible for maintaining and implementing the RPP which will minimize the risks associated with using portable X-Ray producing machines and which will ensure compliance with the regulations of the Nebraska.

The specific actions to be performed by the individual in charge are as follows:

- Receive Radiation Safety Training at a one day course provided by Thermo NITON Analyzers or by a qualified expert. This will be documented by a certificate of completion which is to be kept on file with other RPP documents
- Maintain a list of authorized users and ensure that only authorized users operate the Analyzers.
- *Notify staff of additions to or subtractions from the authorized user list.*
- Schedule and/or conduct training for employees prior to authorizing their use of the NITON Analyzer without direct supervision. Maintain records of training including a copy or a summary of the training material. Training shall include Radiation Safety, Operational, and Emergency Procedures.
- *If personal exposure monitoring (dosimetry) is part of the RPP, then the Individual in charge will be responsible for maintaining dosimetry records.*
- Ensure that all users are following appropriate operating procedures while using Analyzers.
- Maintain manufacturer provided instruction manuals, and operations and maintenance records.
- Ensure proper disposal of unneeded Analyzers.
- Ensure that labels on Analyzers are intact and legible. Notify NITON for assistance with labeling that is damaged or illegible.
- *Review, as needed, the RPP content, implementation, and effectiveness.*

Authorized Workers are responsible for using only approved safe techniques and procedures in operations involving the Analyzer. The specific actions to be performed are as follows:

- Follow proper operating procedures as described in training and ensure other individuals also adhere to these requirements.
- Ensure that the label on the Analyzer is in tact and legible.
- *Ensure proper use of dosimetry, if dosimetry is issued.*
- Be familiar with emergency procedures and know how to recognize and terminate unsafe operations.

4. Safe Operating Procedures

A copy of the Users Manual or Operating and Emergency Procedures shall be made available to all workers using the NITON Analyzer. A copy will be kept with the Analyzer and another copy shall be kept on file with other RPP records.

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Only authorized personnel with training on state regulations, operating and emergency procedures shall be allowed to operate the NITON Analyzer. All authorized personnel are responsible for complying with the requirements of this RPP and will report any and all incidents involving the NITON Analyzer to the individual in charge.

The operator is responsible for ensuring that no part of a person's body is at or near the measurement point, and no closer than one foot during a measurement (trigger finger excluded).

The operator must be aware that the NITON Analyzer is emitting radiation when lights are flashing.

The operator must be aware that radiation in the primary beam could eventually cause physical harm if the device is used improperly and must be able to recognize the symptoms which would begin with skin reddening in the exposed area and at higher doses would appear as a burn or localized tissue damage.

Prior to each use:

- The operator will inspect and maintain the Kapton window and all labels on the NITON Analyzer
- *The operator will fill out the utilization log (if required)*

Environmental Restoration will maintain a log documenting use of the Analyzer that contains, at a minimum, the unit serial number, date/time removed, date/time returned, and responsible individual. At the front of this log will also be a list of authorized users. Refer to Appendix A for example.

5. Emergency Procedures

In any case where one suspects that the x-ray tube remains on when the measurement is terminated:

- Disconnect the battery pack immediately to turn off the x-ray tube, and
- Call Thermo Electron Corporation's Service Department in the United States, toll free, at (800) 875-1578.

Suspect accidental exposure to primary beam

Notify the Individual in Charge and RSO at 314 280-8328

Individual in charge will assess impact and call NITON RSO for assistance if necessary

Severe Physical Damage

There is no radioactive material so a fire or severe damage poses no radiation hazard.

6. Radiation Safety Training

The Individual in charge will be responsible for receiving Radiation Safety Training from Thermo NITON Analyzer LLC 1 day training, or a qualified expert. It will then be this individual's responsibility to train the rest of the workers, whether the workers are trained by the individual in charge, Thermo NITON Analyzer LLC, or by a qualified expert. This training will be documented by a sign-off sheet that includes the topics covered in the radiation safety training which is to be kept with all the RPP documents.

7. Personnel Monitoring

Personal exposure levels may, as determined by the responsible individual or as required by state regulations, be monitored utilizing dosimetry providers accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Badges are not transferable. The following are a few examples of NVLAP accredited labs:

- *Environmental Restoration will use AEIL, 9251 Kirby Drive, Houston, TX 77054*
- *Dosimeters shall only be worn by the individuals they are issued to and shall only be worn during occupational hours.*
- *Never wear the badge during non-occupational exposures such as during medical x-rays or any medical procedures involving radiation.*
- *Dosimeters should be protected from extremes of heat, moisture, and pressure.*
- *Dosimeters shall be stored in a protected area to prevent loss, damage, and other sources of radiation.*

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8. Posting and Labeling

There is a relatively low radiation hazard associated with the Analyzer, and because the authorized user will be with the Analyzer at all times it is operational, posting radiation area signs will not be necessary. A copy of the Nebraska Notice to Employees will be kept in the Analyzer case as well as on file with other RPP documents and will be available for review at any time.

The label on the Analyzer will be checked periodically by the Individual in charge as well as the workers using the Analyzer. The label will be checked for integrity and legibility. If the label becomes faded, worn, damaged, or defaced, the Analyzer will be promptly returned to Thermo NITON Analyzers LLC for relabeling.

9. Record Keeping

The individual in charge will be responsible for all the records associated with the RPP. These records will be kept in an identified location and will be made available for review by any worker or state official upon request. The following is a list of records that will be kept at minimum:

- Personnel training records
- Manufacturer provided instruction manuals and service & maintenance records
- Authorized Users
- State Analytical X-Ray Regulations and Notice to Radiation Workers
- *Analyzer usage log*
- *Personnel Dosimetry Records, if dosimetry is required*

10. Quality Assurance / Annual Review

At the minimum, items on the following list will be done annually:

- *Radiation Safety Review for all workers*
- *Operational & Emergency Procedures Review for all workers*
- *Audit of the RPP content, implementation, and effectiveness*

11. References:

- DOE G 441.1-5 "Radiation-Generating Devices Guide"
- Thermo NITON Analyzers Sample Radiation Safety Program
- NBS Handbook 111, Revised 1977
- Radiation Safety Topics "Writing a Radiation Protection Program For the Industrial X-Ray Program For a Facility with Cabinet Radiographic or Analytical X-Ray Machines"
- Table 11.4.9 "Good Work Practice for X-Ray Diffraction and X-Ray Fluorescence Units" The Health Physics and Radiological Health Handbook

Appendix B

Appendix C

Figures

Figure 1. Smile Learning Center Proposed Excavation Area Map

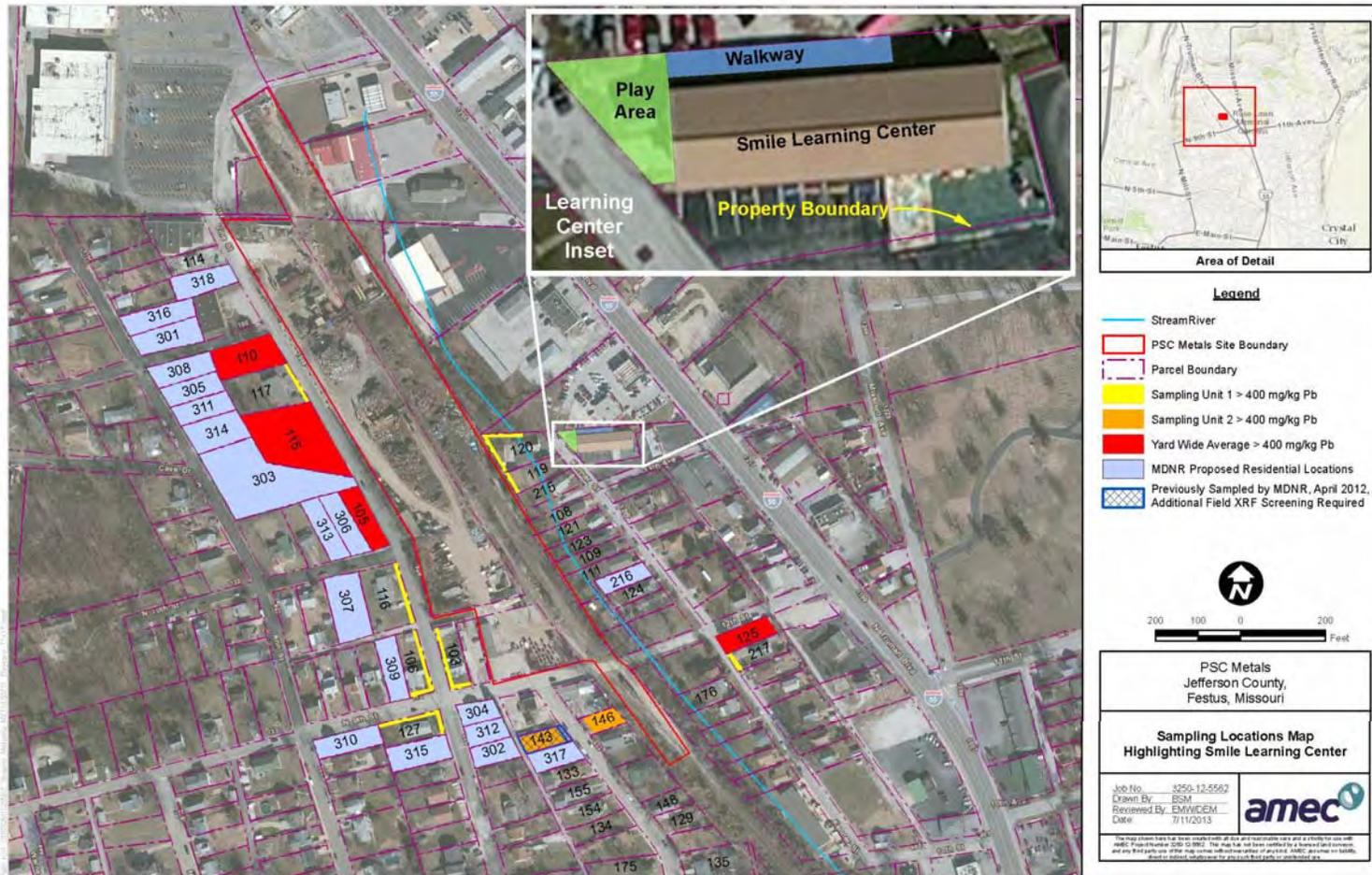
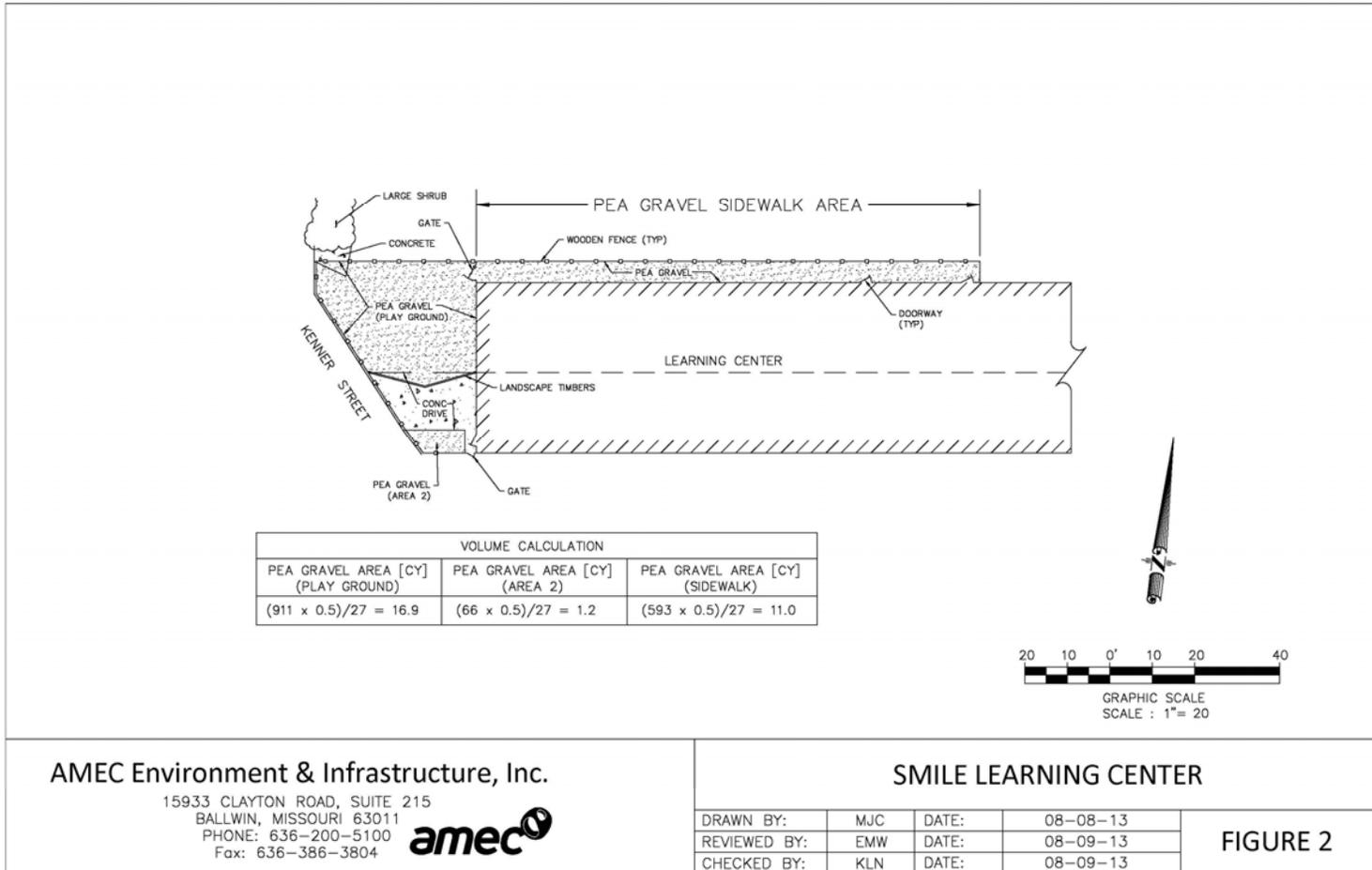


Figure 2. Smile Learning Center – Site Plan of Play Area



AMEC Environment & Infrastructure, Inc.

15933 CLAYTON ROAD, SUITE 215
BALLWIN, MISSOURI 63011
PHONE: 636-200-5100
Fax: 636-386-3804



SMILE LEARNING CENTER

DRAWN BY:	MJC	DATE:	08-08-13
REVIEWED BY:	EMW	DATE:	08-09-13
CHECKED BY:	KLN	DATE:	08-09-13

FIGURE 2