Green, Michelle

From: Miller, Scott
Sent: Tuesday, September 06, 2016 3:04 PM
To: R4_SEMS_Records
Subject: Fw: Final Sap addendum 7 SMS RD
Attachments: SAP addendum 102215 transmittal.pdf; SMS Final SAP Addendum 7 Complete.pdf

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From: Ostrofsky, Arnold <Aostrofsky@versar.com>
Sent: Thursday, October 22, 2015 6:45 PM
To: Miller, Scott
Subject: Final Sap addendum 7 SMS RD

Scott,

The transmittal letter and the final version of the SAP Addendum 7 for the Smokey Mountain Smelters Site is attached. This Addendum details the additional surface and subsurface soil sampling, monitor well installation and groundwater sampling planned for the site. We have incorporated the comments from the meeting we held yesterday.

Please let me know if you have any questions or comments.

Thank You

Arnold Ostrofsky, P.E.
Program Manager

J. M. Waller Associates, Inc.

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A Service Disabled Veteran Owned Small Business

J.M.WALLER® ASSOCIATES, INC.

MANAGING THE VISION®

A SERVICE DISABLED VETERAN OWNED SMALL BUSINESS

RACII Lite 0601

Contract No. EP-S4-08-03

October 22, 2015

Scott Miller, Remedial Project Manager
EPA Region 4, Superfund Branch
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Subject: Transmittal of Final Sampling and Analysis Plan Addendum 7
Smokey Mountain Smelters Site – Task Order 047; Contract No. EP-S4-08-03

Dear Mr. Miller:

Attached is an electronic version (PDF) of the Final Sampling and Analysis Plan Addendum 7 for the Smokey Mountain Smelters Site in Knoxville, Tennessee. This SAP details the additional soil sampling and installation and sampling of new groundwater monitoring wells planned at the Site. This Final version also incorporates the comments we discussed during our October 21st meeting with Superfund Scientific Services Section and the Tennessee Department of Environment and Conservation. Specifically we included additional surface and subsurface soil samples in the area surrounding the former process building.

If you have any questions or comments on this matter, please contact me.

Very truly yours,

Arnold Ostrofsky

Arnold Ostrofsky, P.E.
Project Manager

Attachments

C: M. Miller – J. M. Waller

Addendum 7 to Sampling and Analysis Plan for the Remedial Investigation / Feasibility Study of Smokey Mountain Smelter Site, Knoxville, Knox County, Tennessee (Dated April 2011)

October 2015

Introduction

J. M. Waller Associates, Inc. (J. M. Waller) has prepared this Addendum as an update to the Smokey Mountain Smelters (SMS) RI/FS Sampling and Analysis Plan (SAP) Volume 1, Revision 1, Field Sampling Plan (FSP) and Volume 2, Revision 1, Quality Assurance Project Plan (QAPP) both dated April 2011. This addendum describes proposed additional monitor well installation and sampling and subsurface soil sampling to be performed in order to assess the groundwater flow direction, groundwater contaminant levels, and subsurface soil contaminant levels.

The Addendum is organized by referencing the appropriate section in the April 2011 SAP and providing the new text for changing or inserting. The goals of this field investigation will be to;

1. Collect 44 subsurface soil samples from the area surrounding and encompassing the Former Settling Ponds to further delineate the vertical extent of contamination in this area and in the area around the former processing plant. These samples will assist in determining the area of the planned cap.

2. Install additional monitor wells to serve as piezometers to refine the groundwater potentiometric surface/gradient model, and to collect groundwater samples representative of shallow and fractured rock groundwater flow zones to determine concentration of contaminants.

Section 4.3.1 Additional Surface and Subsurface Soil Sampling

Subsurface soil sampling shall be conducted around the vicinity of the Former Settling Ponds which lies in the center of the site and the eastern boundary of the installed cap area and surface and subsurface soil sampling will be conducted at the former processing plant (Figure 1). Samples shall be collected using a rotasonic drill rig in order to penetrate the various types of debris beneath the surface. 44 samples shall be collected from the subsurface soil to delineate the vertical extent of contamination and attempt to locate a possible continuing source of contamination. All soil samples will be collected in accordance with the SESD Operating Procedure for Soil Sampling (SESDPROC-300-R1) and based on the XRF screening value.

Section 4.4.1 Monitor Well Installation/Construction Field Oversight

J. M. Waller will conduct oversight of a drilling contractor during field investigation to ensure that all drilling related field investigation tasks in accordance with the EPA Region 4 *Field Branches Quality System and Technical Procedures unless otherwise stated in the SAP*. J. M. Waller will also oversee the surveyor subcontractor to locate the new wells.

A J. M. Waller field geologist will oversee the drilling and surveying subcontractors, and will complete boring logs, well construction diagrams, and other pertinent field logs for each drilling

location. Up to seven monitoring wells will be installed via a combination of rotasonic and rotary coring drilling techniques. Of the seven proposed well installations, six wells will be installed as collocated shallow and deep well pairs, with a shallow single cased well screened above bedrock to sample surficial groundwater, and a deep, double cased well cased into fractured yet largely competent carbonate bedrock, and screened to sample the first sizable water bearing fracture encountered. The seventh proposed well (MW8B) will consist of a double cased well, as previously described, to pair with the existing well, MW8A.

Continuous cores will be collected from the ground surface to completion depth of each boring for logging/soil and rock characterization purposes.

Figure 2 depicts the proposed drilling locations. All proposed wells, including MW8B, allow for contemporaneous potentiometric surface gauging and comparative chemical analysis of shallow groundwater and deeper groundwater present in bedrock fractures. Well pairs MW14A/B, MW15A/B, and MW16A/B are located to improve lateral spacing with respect to the current groundwater flow axis in an effort to refine the gradient induced potentiometric head model, outside the lineated arrangement provided by the current array of monitoring wells.

Monitor Well Installation will be performed in accordance EPA Region 4 Science and Ecosystem Support Division (SESD) Field Branch Quality System Technical Procedures (FBQSTP) Guidance *Design and Installation of Monitoring Wells (SESDGUID-101-R1)* dated January 2013, as amended or modified. Each of the new monitor wells shall be installed in separate borings. Basic construction design details for the proposed wells include:

Surface casing (where necessary) will be constructed of 6-inch inside diameter (ID), machine threaded sections of Schedule 40 PVC pipe. Surface casing will be installed via the plunger method, using a pre-cured grout plug in the terminal end of the casing to insure a good grout to formation bond. Drilling through the grout plunger and into the formation below will occur no earlier than 24 hours after grouting.

Well screens will consist of 10 to 20 foot sections of 2-inch ID, machine threaded, Schedule 40 polyvinyl chloride (PVC) screen with 0.01 inch slotted openings. The bottom of the well will terminate with a threaded Schedule 40 PVC end cap. The remaining well riser casing will consist of machine threaded sections of 2-inch ID, Schedule 40 PVC riser which will extend from the top of the screen to the ground surface.

Filter packs will surround the screen in the well annulus to at least 2 feet above the top of the screen. Filter material will consist of 20-30 mesh sand or product with similar gradation. Filter pack grain size analysis shall be reviewed by the J.M. Waller field geologist prior to installation to determine the suitability for use with the specified 0.010 inch slotted screen openings. The depth of the filter pack will be measured with a weighted depth tape prior to emplacement of the annular seal.

Annular seals will consist of a minimum of a 2 foot thick layer of one-quarter inch diameter bentonite pellets. The seal will be placed above the screen and hydrated with for a minimum of 60 minutes or longer (in accordance with the manufacturer's instructions) prior to grouting. Depth of the hydrated seal will be verified with a weighted depth tape prior to grouting.

Borehole backfill (if required) shall consist of bentonite pellets. Filter sand shall extend at least two feet below the top of backfill and the lower terminus of the well casing/screen assembly.

Annular filler will be placed into the borehole annulus from the bottom up via pressure methods and a tremie pipe. Grout will be of the bentonite-cement type, mixed in the proportions 94 pounds

(lbs) Type I Portland Cement, 6 gallons of potable water, and no more than 2 lbs bentonite powder to yield a grout slurry of at least 15 lbs/gal. Grout density will be verified using a grout scale during mixing of individual batches, and upon circulation from the borehole.

Monitoring wells will be completed with 2 foot by 2 foot by 6 inch thick concrete surface pad and a traffic-rated "flush-mount" manhole. The concrete pad will be flush with existing grade at the edges and tapered such that water will run off of the pad and mechanical equipment such as lawnmowers may be operated over the well without damage to the well or motorized equipment. Each well will be fitted with a sealing cap and a keyed padlock. Manhole covers will be fitted with 3/8 inch hex key (Allen) head bolts, consistent with existing installations.

All drilling fluids, purge water, and decontamination fluids generated during the well installation will be containerized and staged onsite pending characterization and ultimate disposal at a permitted waste treatment and storage facility via a licensed waste transporter. Temporary waste holding vessels will include weatherproof covers to prevent precipitation runoff.

Section 4.4.2 Well Development

The monitor wells will be developed after installation to remove fines and sediments from around the well screens and to remove drill cuttings and residual drilling fluids from the area around the monitored interval of the boring. EPA guidance *SESDGUID-101-R1*, as amended or modified, will be followed for well development procedures.

Development will be conducted by the driller not less than 24 hours after completion of the annular space including grout placement. Completed well development methodology will include mechanical surging and overpumping to produce well effluent of low turbidity and stable geochemical parameters including specific conductance, dissolved oxygen, pH, and oxidation reduction potential as determined via field instrumentation. Stabilization criteria described in EPA Region 4 Field Science and Ecosystem Support Division Operating Procedure: Groundwater Sampling *(SESDPROC-301-R3)* (EPA, 2013) will be applied to well development at relatively high flow rates to demonstrate that the well effluent is representative of formation water in preparation for later sampling events.

Table 4-1 provides the Sample locations and rationale and 4-2 provides the proposed analytical methods.

Section 4.14 Project Schedule and Deliverables

TABLE 4-3: Project Schedule

Smokey Mountain Smelter Site

TASK NO.	DESCRIPTION	START DATE	DURATION in Days	FINISH DATE
300	Field Investigation	12/1/15	12	12/15/15
400, 500	Sample Analyses & Data Validation	12/15/15	20	1/15/16
612	Data Evaluation	1/15/16	10	1/30/16
700	Treatability Study/Pilot Testing	2/15/16	120	7/15/16
800	Preliminary Design	3/1/16	30	4/15/16
1100	Pre-Final Design	6/1/16	30	8/1/16
1400	Task Order Closeout	9/15/16	15	9/30/16

Notes:

1. Initiation of field investigation task is dependent on approval of the SAP Addendum 7.
2. Completion of data evaluation is dependent upon timely receipt of validated data from the EPA.

Section 5.1.2.3 Additional Soil Sampling

Samples will be collected from the locations shown on Figure 1.

The locations where both surface and subsurface soil are planned to be collected are designated on the Figure 1.

Samples shall be analyzed for TAL Metals and will be submitted to EPA Region 4 ASB or the designated CLP Laboratory for analysis. The following procedure will be used to obtain subsurface soil samples from the rotasonic macro-core.

1. With stainless steel bowl and sampling equipment immediately available, don uncontaminated gloves and prepare sampling log sheet with pertinent information.
2. Record XRF reading from each sample core. Take a reading at each foot in the 10 – 20 ft. interval possibly as deep as the capillary fringe. The exact depth for XRF reading will vary based on location and visual observations. The plan is to try and locate the bottom of the former ponds. In the area surrounding the former process plant XRF readings will be taken at five foot intervals.
3. After XRF has been recorded, collect a portion of a discrete sample from the interval with the highest XRF reading and place in stainless steel bowl.
4. Homogenize the sample in the stainless steel bowl with a stainless steel spoon.
5. Transfer soil to appropriate sample containers and place in designated sample coolers.
6. Samples shall be chilled to 4 ± 2° C or less without freezing in iced coolers.
7. Label, pack, and ship samples in accordance with the SESD Operating Procedure for Packing, Marking, Labeling, and Shipping of Environmental and Waste Samples (SESDPROC-209.R1).
8. Document the entire sampling process in the field logbook in accordance with the SESD Operating Procedure: Logbooks (SESDPROC-010-R3).

Section 5.1.3.1 Monitor Well Groundwater Sampling

After newly installed wells have been developed a synoptic round of water levels should be performed on all monitor wells throughout the site. Groundwater samples shall be collected from each of the seven newly installed shallow monitor wells shown on Figure 2 in this Addendum 7. Samples will be submitted to EPA Region 4 ASB or the designated CLP Laboratory for analysis of TAL Metals and alkalinity. Groundwater samples shall be collected according to *SESDPROC-301-R3, Groundwater Sampling* and follow the procedures below:

<u>WELL PURGING LOW FLOW/LOW STRESS PROCEDURE</u>

1. The depth to water in the well will be measured and recorded to the nearest 0.01 feet, via electric water level meter.

2. The required length of tubing will be calculated, measured, and attached to the peristaltic pump, such that the intake is placed at the midpoint of the saturated screened interval. Note that the tubing will be measured to allow a minimum distance between the wellhead and the discharge point (field testing equipment), to minimize temperature changes in the groundwater discharged from the well. Teflon® or Teflon®-lined tubing will be used and disposed of after sampling is complete.
3. The tubing will be slowly and smoothly lowered to the required depth to minimize the amount of mixing in the well. The discharge tubing will be secured to the well casing (or PVC stick-up) to minimize movement.
4. The field-testing equipment will be placed as close as possible to the well head/discharge tubing.
5. The pump will be connected to the power supply (battery or other power source, and the power supply turned on (without starting the pump).
6. The depth to water with the tubing in the well will be re-measured and compared with the initial reading; if the readings vary by greater than 0.05 feet, field personnel will wait for five minutes, re-measure the water and begin pumping.
7. The pump will be started at the lowest flow setting (attempt 100 to 200 milliliters per minute). The pump start time will be recorded. (Note that during the initial period of pumping, an estimated initial 5 to 10 minutes, the depth to water in the well should be measured frequently (at an estimated frequency of approximately once per minute), to enable timely pump flow adjustments to attempt to minimize significant drawdown in the well). The drawdown in the well will be maintained during pumping to 0.3 feet or less, by adjusting the pump flow rate.
8. The initial groundwater sample discharged from the tubing will be collected and field parameters (pH, temperature, conductivity, turbidity, salinity, and dissolved oxygen) will be measured and recorded, as well as the time.
9. These field parameters (pH, temperature, conductivity, turbidity, salinity, and dissolved oxygen) and the depth to water in the well (using the M-scope) will be measured at five-minute intervals (initially the water level will be measured more frequently, as discussed in step 7 above). The data and the associated time will be recorded on the low-flow sampling data sheet. Attempts will be made to maintain the drawdown in the well during pumping to 0.3 feet or less, by adjusting the pump flow rate. Drawdown for each well will vary depending on the recharge capacity of the well. Drawdown may exceed 0.3 feet in some or all wells.
10. Following the stabilization of measured field parameters, groundwater samples will be collected. "Stabilization" is considered to be achieved when three consecutive readings, taken at three (3) to five (5) minute intervals, are within the following limits:
    - Turbidity (10% for values greater than 10 NTU)
    - DO (10%)
    - Temperature (3%)
    - pH (+/- 0.1 unit)

All measurements, except turbidity, must be obtained using a flow-through cell. The minimum purge volume is two (2) times the stabilized drawdown volume plus the extraction tubing volume. If parameters do not stabilize, then it should be noted in the logbook.

All pertinent field data will be recorded on Sample Log Sheets and referenced in the field logbook. Appropriate chain-of-custody procedures will be followed using the Scribe software package. Samples will be labeled, preserved, packed and shipped according to Section 5.2.2 of the SAP and CLP requirements. A monitor well sample log sheet is included as an attachment.

Section 5.2.1.1 Former Settling Pond Sample and Former process Building Designation
Each sample collected from the Former Settling Pond will be assigned a unique sample identification number. Any other pertinent information regarding sample identification will be recorded in the field logbooks and/or sample log sheets. MS and laboratory duplicate samples will be designated on the field documentation forms including the COC.

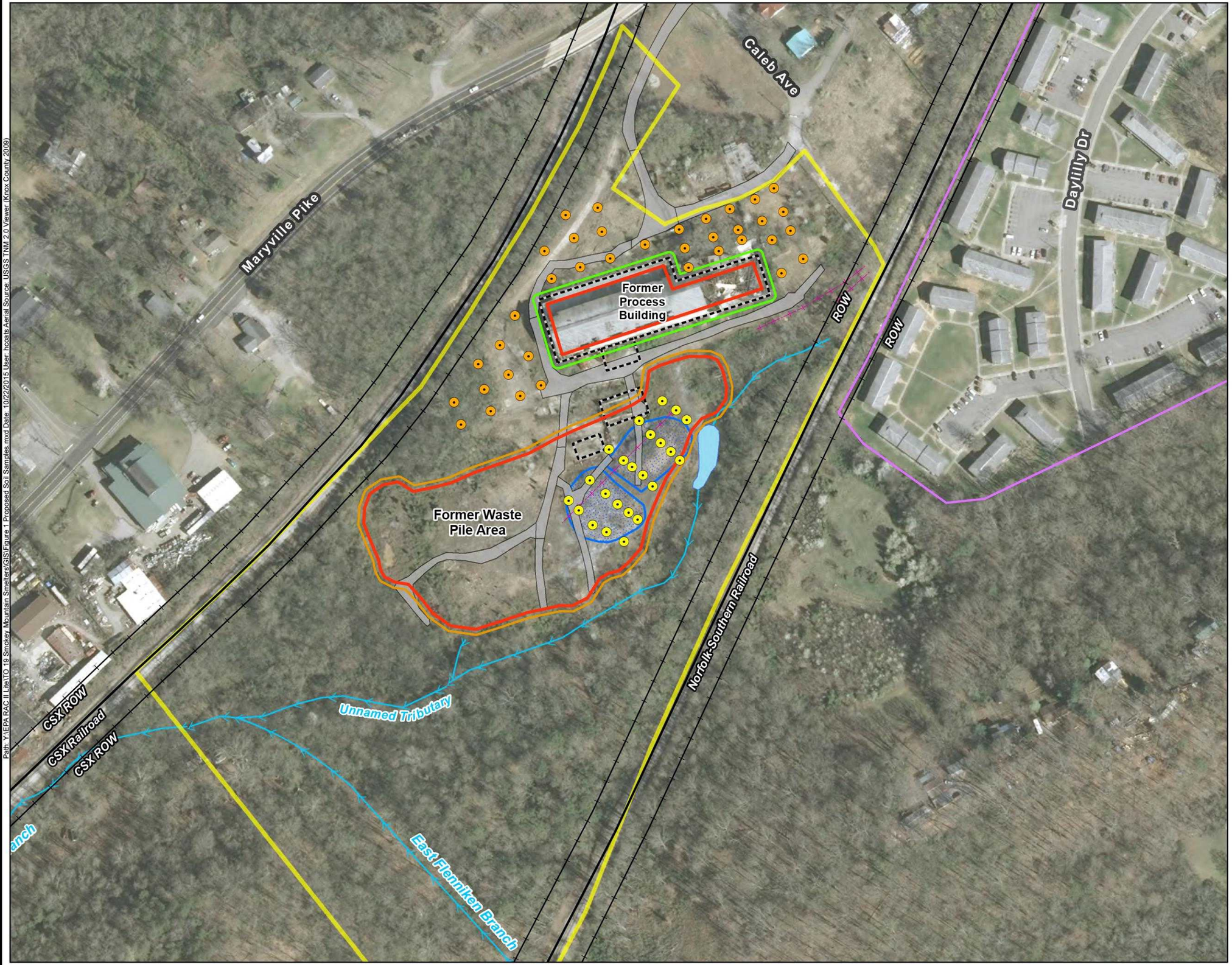
- Former Settling Pond locations: SMSSPSB##-TD-BD

Where:
SMS = Smokey Mountain Smelters
SP = Settling Pond
PB= Process Building
SB = Subsurface Soil
= sequential number
TD = Top Depth for the sampling interval (in ft bgs)
BD = Bottom Depth for the sampling interval (in ft bgs)

All other sample identification will be as indicated in section 5.2.1 with the exception of Field Duplicate which will be labeled with an X after the sequential number. Specific depths of samples will also be noted in the field logbook, on associated field sampling forms, and in the Scribe data management software.

FIGURES

Path: Y:\EPA RAC II Lite\TO 19 Smokey Mountain Smelters\GIS\Figure 1 Proposed Soil Samples.mxd Date: 10/22/2015 User: hcoats Aerial Source: USGS TNM 2.0 Viewer (Knox County 2009)



Legend

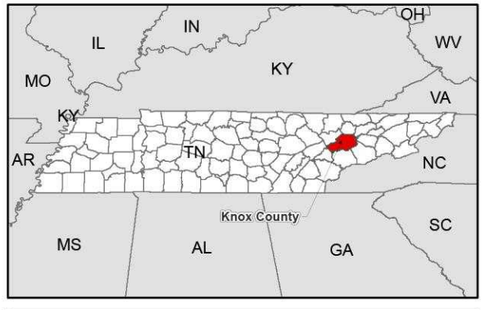
- Proposed Subsurface Soil Sample
- Proposed Surface and Subsurface Soil Sample
- Railroad Tracks
- Railroad ROW
- Abandoned Railroad Spur
- Montgomery Village Apts.
- SMS CAP Area (Footprint of former process building)
- SMS CAP Area 2 (Footprint of the former waste area)
- Former Structure
- Waste Pile
- SMS Approx Site Boundary
- Temporary Gravel Road
- Former Settling Ponds
- Pond
- Surface Water Pathway

N

Feet

0 90 180 360

WGS84



SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, KNOX COUNTY, TENNESSEE

FIGURE 1
Proposed
Soil Samples

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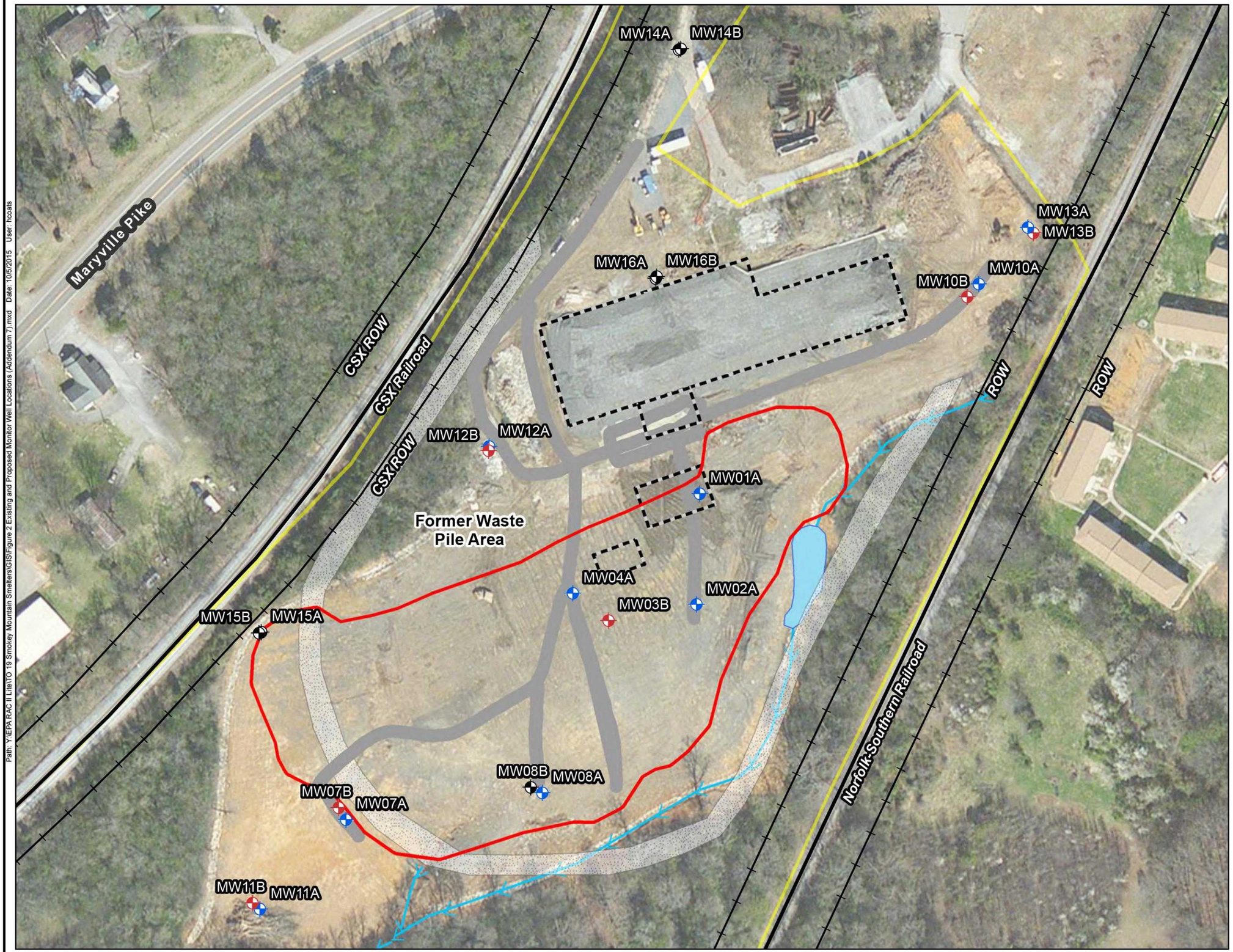


Legend

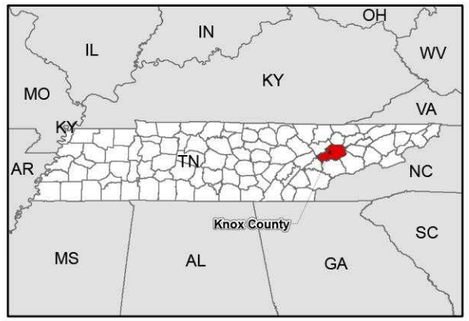
- Shallow Monitor Wells
- Deep Monitor Wells
- Proposed Monitor Wells
- Railroad Tracks
- Railroad ROW
- Temporary Gravel Road
- Surface Water Pathway
- SMS Approx Site Boundary
- Waste Area
- Former Structure
- Drainage Ditch
- Pond

N

Feet

0 50 100 200

WGS84



SMOKEY MOUNTAIN SMELTERS
KNOXVILLE, KNOX COUNTY, TENNESSEE

FIGURE 2
Existing and Proposed Monitor Well Locations (Addendum 7)

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Path: Y:\EPA RAC II Lite\TO 19 Smokey Mountain Smelters\GIS\Figure 2 Existing and Proposed Monitor Well Locations (Addendum 7).mxd Date: 10/5/2015 User: hcoats

TABLES

Table 4-1
Sample Location and Rationale Summary
Smokey Mountain Smelters
Knoxville, Knox County, Tenneessee

Location ID	Sample Code	Sample Location		Activity	Rationale
		Longitude	Latitude		
Groundwater					
SMSMW14A	SMSMW14A	35.920086	-83.926583	TAL Metals including Mercury, Hexavalent Chromium, Cyanide, chloride and alkalinity	Characterize groundwater contamination and collect addional information to determine groundwater flow direction.
SMSMW14B	SMSMW14B	35.920089	-83.926575		
SMSMW16A	SMSMW16A	35.919377	-83.926699		
SMSMW16B	SMSMW16B	35.919383	-83.926695		
SMSMW15A	SMSMW15A	35.918315	-83.928251		
SMSMW15B	SMSMW15B	35.918312	-83.928259		
SMSMW08B	SMSMW08B	35.917805	-83.927238		
Subsurface Soil					
SMSSPSB01	SMSSPSB01-XX-XX	-83.927082	35.918182	Screening with XRF, TAL Metals with mercury, Hexavalent Chromium, Cyanide and Chloride	Determine concentration of metals below former pond area subsurface soil
SMSSPSB02	SMSSPSB02-XX-XX	-83.927029	35.918111		
SMSSPSB03	SMSSPSB03-XX-XX	-83.926952	35.918048		
SMSSPSB04	SMSSPSB04-XX-XX	-83.926864	35.918016		
SMSSPSB05	SMSSPSB05-XX-XX	-83.926778	35.917979		
SMSSPSB06	SMSSPSB06-XX-XX	-83.926679	35.918029		
SMSSPSB07	SMSSPSB07-XX-XX	-83.926783	35.918079		
SMSSPSB08	SMSSPSB08-XX-XX	-83.926866	35.918116		
SMSSPSB09	SMSSPSB09-XX-XX	-83.926948	35.91819		
SMSSPSB10	SMSSPSB10-XX-XX	-83.927008	35.918241		
SMSSPSB11	SMSSPSB11-XX-XX	-83.926946	35.918285		
SMSSPSB12	SMSSPSB12-XX-XX	-83.926862	35.918224		
SMSSPSB13	SMSSPSB13-XX-XX	-83.926785	35.918178		
SMSSPSB14	SMSSPSB14-XX-XX	-83.9267	35.918128		
SMSSPSB15	SMSSPSB15-XX-XX	-83.926593	35.918137		
SMSSPSB16	SMSSPSB16-XX-XX	-83.926633	35.918165		
SMSSPSB17	SMSSPSB17-XX-XX	-83.926711	35.918215		
SMSSPSB18	SMSSPSB18-XX-XX	-83.926783	35.91827		
SMSSPSB19	SMSSPSB19-XX-XX	-83.926875	35.918337		
SMSSPSB20	SMSSPSB20-XX-XX	-83.926803	35.91838		
SMSSPSB21	SMSSPSB21-XX-XX	-83.926718	35.918315		
SMSSPSB22	SMSSPSB22-XX-XX	-83.926639	35.918277		
SMSSPSB23	SMSSPSB23-XX-XX	-83.926575	35.918221		
SMSSPSB24	SMSSPSB24-XX-XX	-83.926523	35.918186		
SMSSPSB25	SMSSPSB25-XX-XX	-83.926493	35.918299		
SMSSPSB26	SMSSPSB26-XX-XX	-83.926552	35.918355		
SMSSPSB27	SMSSPSB27-XX-XX	-83.926617	35.918398		
SMSSPSB28	SMSSPSB28-XX-XX	-83.926667	35.91843		
SMSSPSB29	SMSSPSB29-XX-XX	-83.926753	35.918487		
SMSSPSB30	SMSSPSB30-XX-XX	-83.926686	35.918557		
SMSSPSB31	SMSSPSB31-XX-XX	-83.926619	35.918502		
SMSSPSB32	SMSSPSB32-XX-XX	-83.926524	35.918464		
SMSSPSB33	SMSSPSB33-XX-XX	-83.926469	35.918423		
SMSSPSB34	SMSSPSB34-XX-XX	-83.926423	35.918364		
SMSSPSB35	SMSSPSB35-XX-XX	-83.926324	35.918421		
SMSSPSB36	SMSSPSB36-XX-XX	-83.926377	35.918467		
SMSSPSB37	SMSSPSB37-XX-XX	-83.926438	35.918513		
SMSSPSB38	SMSSPSB38-XX-XX	-83.926497	35.918555		
SMSSPSB39	SMSSPSB39-XX-XX	-83.926564	35.918626		
SMSSPSB40	SMSSPSB40-XX-XX	-83.926455	35.918665		
SMSSPSB41	SMSSPSB41-XX-XX	-83.926385	35.918604		
SMSSPSB42	SMSSPSB42-XX-XX	-83.926324	35.918527		
SMSSPSB43	SMSSPSB43-XX-XX	-83.926277	35.918485		
SMSSPSB44	SMSSPSB44-XX-XX	-83.926273	35.918623		

Notes:
TCL - target compound list
TAL - target analyte list

Table 4-2
Proposed Analytical Method and Sample Summary
Smokey Mountain Smelters
Knoxville, Knox County, Tenneessee

Sample Matrix	Field Parameters	Laboratory Parameters	Analytical Method	No. of Samples[1]	QA/QC Samples				Total	Lab Assigned	Bottleware and Preservative Requirements				
					Field Duplicates	Equipment Rinsate Blanks	Trip Blanks	MS/MSD			Number of Containers	Type of Container	Minimum Sample Volume	Preservation	Holding Time
Subsurface Soil	XRF	TAL Metals with Mercury	CLP SOW ILM05.4	44	4	2	NA	1	48	CLP	48	8 oz. glass	Fill to Capacity	Cool to 4° C	6 months
		Hexavalent Chromium	Standard methods 3500 CR D	44	4	2	NA	1	48	SESD	48	8 oz. glass	Fill to Capacity	Cool to 4° C	24 hours
		Cyanide	EPA 335.4	44	4	2	NA	1	48	SESD	48	8 oz. glass	Fill to Capacity	Cool to 4° C	12 days
		Chloride	EPA 310.2	44	4	2	NA	1	48	SESD	48	8 oz. glass	Fill to capacity	Cool to 4° C	28 days
Groundwater	Dissolved Oxygen, Temperature, pH, ORP, Specific Conductance, Turbidity	TAL Metals with Mercury	EPA 6010C / EPA 245.1	7	1	NA	NA	1	10	CLP	10	1 L HDPE	1 L	Cool to 4° C HNO_3 to pH <2	180 days
		Hexavalent Chromium	EPA 7199	7	1	NA	NA	1	10	SESD	10	500 mL HDPE	500 mL	Cool to 4° C buffer	28 days
		Cyanide	EPA 335.4	7	1	NA	NA	1	10	SESD	10	1 L HDPE	Fill to Capacity	Cool to 4° C	12 days
		Chloride	EPA 352.2	7	1	NA	NA	1	10	SESD	10	500 mL HDPE	500 mL	Cool to 4 ± 2° C	28 days

Notes:

[1]Estimated number of samples based on Draft Work Plan Revision 1, dated September 2015.
ORP - oxidation reduction potential
DO - dissolved oxygen
MS/MSD - matrix spike/ matrix spike duplicate
HDPE - high density polypropylene
TAL - target analyte list
HNO_3 - nitric acid