CMSA Pad Removal
Sampling and Analysis Plan Addendum

Former Lake Ontario Ordnance Works

Submitted To:

US Army Corps of Engineers, Buffalo District

Submitted By:

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1.0 Project Description

This Sampling and Analysis Plan (SAP) Addendum is being prepared under contract to USACE for use during the Contaminated Material Storage Area (CMSA) pad removal at the Former Lake Ontario Ordnance Works (the Site). This Plan will document the means and methods used to conduct sample collection during removal of the CMSA pad to verify that the complete extent of contamination has been removed prior to site restoration.

2.0 Scope and Objectives

The scope of the work includes the removal, transportation, and disposal of the 175'x175' CMSA Pad (including underlying geotextile material) and removal and disposal of approximately 220 concrete barrier blocks that surround the Pad. The concrete barriers will be disposed of as construction debris and will not require sampling and analysis. The CMSA Pad will be sampled and analyzed per transportation and disposal requirements included in the approved Sampling and Analysis Plan and will not be repeated in this Addendum. If required by the disposal facility, samples will be collected for radiological parameters for waste disposal approval. The sample results will be used to determine disposal requirements. Following removal of the pad, verification samples will be collected in order to determine whether any residual contaminated materials are present.

3.0 Sample Collection and Analysis Procedures

Verification samples will be performed after the CMSA Pad has been removed. If any visibly contaminated soils are observed, the soil will be removed prior to verification sample collection. In addition, the bottom of the initial excavation will be scanned for radioactivity using a 2"x2" NaI detector coupled to a ratemeter/scaler. A reading of three times background will trigger a "Stop Work Action" and the Contracting Officer will be notified. Verification sample locations and depths will be determined by USACE, DEC and CWM. Six verification samples will be collected using a sampling trowel. Due to the nature of the materials being sampled (i.e., potential for explosives present), all tools and equipment utilized will be non-sparking (e.g., stainless steel). Samples will be submitted to Waste Stream Technology, Inc. (WST) of Buffalo, New York for the analyses summarized in Table 1. Samples will be hand delivered to WST (302 Grote Street, Buffalo, NY 14207) or, with prior arrangement with the laboratory, picked up at Sevenson's main office by the laboratory courier. WST is certified by USACE

for the required parameters with the exception of explosives; WST will arrange subcontracted service with a USACE certified laboratory for the explosives analysis of the samples.

Table 1: Sampling and Analysis Matrix

Sample	Location	Rationale	Frequency	Parameter(s)	Sample Type	Type of Bottles	Number of Bottles	Methodology	Holding Time	Preservative
Verification Samples	CMSA Pad following removal of stone	Samples will be collected in order to verify that no residual contamination remains following removal of the Pad	6 samples collected at direction of USACE	Nitroaromatic and nitramine explosives	Grab	4 oz. CWM	2	SW-846 8330	7 days to extraction 40 days to analysis	Cool 4°C
				TAL Metals	Grab	4 oz. CWM	2	SW-846 3051/6010B/7471A	180 days (28 days for Hg)	Cool 4°C
				PCBs	Grab			SW-846 3550/8082	14 days to extraction 40 days to analysis	
				TCL Semi-Volatile Organic Compounds	Grab			SW-846 3550C/8270C	14 days to extraction 40 days to analysis	
				TCL Volatile Organics	Grab	EnCore sampler	2	SW-846 5035/8260B	48 hours to preservation by laboratory 14 days to analysis	Cool 4°C
				Gamma Spectroscopy	Grab	1L HDPE	1	M-GAMMA-01-XX	6 Months	NA
				Radium-226	Grab			M-RA226-03-XX	6 Months	
				Radium-228	Grab			M-RA228-02-XX	6 Months	
				Isotopic Thorium	Grab			M-TEVA-01-XX	6 Months	
				Isotopic Uranium	Grab			M-UTEVA-02-XX	6 Months	
				Gross Alpha/Beta	Grab			M-GROSSAB-00-XX	6 Months	

Following sample collection, all non-dedicated sampling equipment will be decontaminated as described in Section 3.2. Non-contact debris (e.g., paper or non-paper office wastes, plastic wrapping, cardboard boxes, daily trash) will be bagged and removed by a commercial trash hauling and disposal company; no additional management, tracking, or testing of this waste will be conducted.

Upon receipt of the sample results from the laboratory, chemical results will be compared to USEPA Region 9 Preliminary Remedial Goals (Attachment 1). Radiological results will be compared to background levels. Background will be reestablished per Radiation Safety Plan. If any verification sample results exceed the cleanup criteria, the upper six inches of material will be removed and disposed of. An additional round of verification sampling will be conducted as directed by USACE. At the completion of field sampling activities, a final narrative report detailing all work performed on-site will be submitted. The report will include all test results, transportation and disposal papers, QC/QA reports, and anything else pertinent to the project.

3.1 Quality Assurance and Quality Control Samples

Quality assurance (QA) and quality control (QC) samples are collected and analyzed as a check of field sampling procedures and to verify the performance of the primary laboratory. One QA split sample will be collected by USACE and submitted to a separate laboratory from the other project samples. Due to the nature of the sampling, no additional QA/QC samples are required.

3.2 Sampling Equipment Decontamination

The following describes standard operating procedures for the decontamination of non-disposable sampling equipment and tools that may come into direct contact with a field sample intended for analytical analysis. This procedure only addresses the decontamination of equipment as it pertains to the chemical integrity of samples for analysis and is not intended for use in health and safety decontamination of personnel, materials, and equipment that may become contaminated during field operations.

3.2.1 Applicability

Decontamination of all analytical devices, sampling tools, and storage equipment that may come into direct contact with a field sample is necessary in order to achieve analytical results that are representative of true field conditions. To the extent practical, no sampling equipment will be decontaminated in the field and disposable sampling equipment will be utilized. Sufficient sampling equipment will be pre-cleaned, wrapped in aluminum foil, and brought to the field.

The decontamination procedures below may be modified, upon proper managerial approval, as long as the chemical integrity of the field sample is maintained and the sample source is not permanently compromised. Anticipated contaminants and concentrations, matrices (water, air, soil, etc.), surface area of possible cross contamination, method of sampling, and many other factors are considered when establishing a sampling equipment decontamination procedure. Any modifications of the procedures below will be carefully thought out, approved by Sevenson's CQC Manager and the USACE Contracting Officer or a Designated Representative, and documented accordingly.

3.2.2 Procedures

All equipment will be considered contaminated unless determined otherwise. In order to provide consistency to the decontamination procedure, a designated sampling team crewmember will be responsible for equipment decontamination. Similarly, it is desirable to decontaminate all the equipment necessary for a field task prior to mobilization. In this way, field decontamination will be limited.

The following supplies are needed for equipment decontamination:

- Clean disposable nitrile gloves
- Wastewater container (drum, basin, or buckets)
- Clean water spraying devices (plastic squirt or spray bottles)
- Clean brushes
- Plastic garbage bags
- Non-phosphate detergent (e.g., Alconox®)
- Deionized/distilled water (i.e., DI water)
- Clean plastic buckets and other containers, as needed (e.g., small plastic swimming pool)
- Plastic sheeting to cover ground at work station
- Aluminum foil
- Package labels, ink pens, and black markers
- Potable water, warm if available
- 1% nitric acid if equipment will be used for sampling for inorganic analysis
- Reagent grade methanol

The following steps will be considered as Sevenson's general equipment decontamination procedure:

1. Cover hands with disposable gloves
2. Wash and scrub the equipment in a solution of non-phosphate detergent (e.g., Alconox) and potable water
3. Rinse three times with potable water
4. Rinse with 1% nitric acid solution
5. Rinse with potable water
6. Rinse with reagent grade methanol
7. Rinse with potable water

8. Rinse with deionized reagent grade water and allow to air dry thoroughly
9. If equipment will not be used immediately, wrap in aluminum foil (shiny side out)

All handling of decontaminated equipment will be performed using clean disposable gloves. Care will be exercised in the storage of decontaminated equipment, so as to not re-contaminate what has been cleaned. Sampling personnel will also avoid solvents, greases, oils, gasoline, water, dusts, and other potential sources that might contaminate the equipment before its use. Sampling personnel handling such materials shall wear protective gloves when doing so.

ATTACHMENT 1

	USEPA Region 9 - Preliminary Remedial Goals (Industrial Soil)
Volatiles	
Acetone	6000
Benzene	1.3
Benzoic Acid	100,000
2-Butanone	27,000
Carbon Disulfide	720
Carbon Tetrachloride	0.55
Chlorobenzene	530
Chloroethane	6.5
Chloroform	12
Dibromochloromethane	2.6
1,2-Dichlorobenzene	370
1,3-Dichlorobenzene	63
1,4-Dichlorobenzene	7.9
1,1-Dichloroethane	1,700
1,2-Dichloroethane	0.6
1,1-Dichloroethene	410
trans-1,2-Dichloroethene	230
1,3-Dichloropropane	NA
Ethylbenzene	20
113-Freon (1,1,2-Trichloro-1,2,2-Trifluoroethane)	5,600
Methylene Chloride	21
4-Methyl-2-Pentanone	NA
Tetrachloroethene	3.4
1,1,1-Trichloroethane	1,200
1,1,2,2-Tetrachloroethane	0.93
1,2,3-Trichloropropane	0.011
1,2,4-Trichlorobenzene	3,000
Toluene	520
Trichloroethene	0.11
Vinyl Chloride	0.75
Xylenes	420
Semivolatiles	
Acenaphthene	29,000
Acenaphthylene	NA
Aniline	300
Anthracene	100,000
Benzo(a)anthracene	2.1
Benzo(a)pyrene	0.21
Benzo(b)fluoranthene	2.1
Benzo(g,h,i)perylene	NA
Benzo(k)fluoranthene	21
Bis(2-Ethylhexyl)phthalate	120
Butylbenzylphthalate	100,000
Chrysene	210

mg/kg OR ppm

	USEPA Region 9 - Preliminary Remedial Goals (Industrial Soil)
4-Chloroaniline	2,500
4-Chloro-3-methylphenol	NA
2-Chlorophenol	240
Dibenzofuran	3,100
Dibenzo(a,h)anthracene	0.21
3,3'-Dichlorobenzidine	3.8
2,4-Dichlorophenol	1,800
2,4-Dinitrophenol	1,200
2,6-Dinitrotoluene	620
Diethylphthalate	100,000
Dimethylphthalate	100,000
Di-n-butyl phthalate	NA
Di-n-octyl phthalate	25,000
Fluoranthene	22,000
Fluorene	26,000
Hexachlorobenzene	1.1
Indeno(1,2,3-cd)pyrene	2.1
Isophorone	1,800
2-Methylnaphthalene	NA
2-Methylphenol	31,000
4-Methylphenol	3,100
Naphthalene	190
Nitrobenzene	100
2-Nitroaniline	18
2-Nitrophenol	NA
4-Nitrophenol	NA
3-Nitroaniline	NA
Pentachlorophenol	9
Phenanthrene	NA
Phenol	100,000
Pyrene	29,000
2,4,5-Trichlorophenol	62,000
PCBs	
Aroclor 1016	21
Aroclor 1221	0.74
Aroclor 1232	0.74
Aroclor 1242	0.74
Aroclor 1248	0.74
Aroclor 1254	0.74
Aroclor 1260	0.74
2,4,6-Trinitrotoluene	57

Notes:
NA = Not Available

Metals	USEPA Region 9 - Preliminary Remedial Goals (Industrial Soil)
Aluminum	100,000
Antimony	410
Arsenic	260
Barium	67,000
Beryllium	1,900
Cadmium	450
Calcium	NA
Chromium	450
Cobalt	1,900
Copper	41,000
Cyanide	NA
Iron	100,000
Lead	750
Magnesium	NA
Manganese	19,000
Mercury	310
Nickel	20,000
Potassium	NA
Selenium	5,100
Silver	5,100
Sodium	NA
Thallium	67
Vanadium	7,200
Zinc	100,000

Notes:
NA = Not Available – will use NFSS background screening criteria.