US Army Corps
of Engineers
Buffalo District

Design-Level Sediment Sampling and Analysis Plan

Springville Dam and Cattaraugus Creek Sediment Sampling

Authorized under GLFER

Springville Dam Project
Springville, NY

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EXECUTIVE SUMMARY

The United States Army Corps of Engineers (USACE) will perform pre-construction sediment sampling up-stream of the Springville Dam in the Cattaraugus Creek, which is located south of Springville, NY. The investigation is being performed under the Great Lakes Fisheries Restoration Program (GLFER). The project goal is to retrieve sediment samples from the channel of the Cattaraugus Creek at specific locations to determine whether sediments targeted for future removal meet the NYS criteria for a positive beneficial use determination (BUD) and thus uncontrolled re-use at an upland site.

Sediment samples will be collected to meet several Data Quality Objectives (DQOs) that include chemical and physical characterization of the sediment for decision making purposes. The Corps will sample surface and subsurface sediment behind the Springville Dam by opening the dam penstocks to lower creek elevations and expose sediment for drilling and sampling. The field work (sediment sampling) will be scheduled for mid- to late-2017 to coincide with seasonal low-water conditions in the creek. The effort will include systematic samples that meet the NYSDEC requirements for a case-specific BUD under 6 NYCRR Part 360-1.15(d).

The Corps will contract a drilling service and self-perform the field sampling, sample management, and data management; a separate contract for analytical services will be let and electronic data deliverables of the results will be processed and evaluated by USACE-Buffalo personnel. The stakeholder group will be provided access to all datasets to ensure transparency.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ACRONYMS, FORMULAS, AND SYMBOLS

AOC	Area of Concern
AHA	Activity hazard Analysis
bgs	Below-ground Surface
cpm	counts per minute
CFR	Code of Federal Regulations
COC	Chain of Custody
DMP	Data Management Plan
DoD	Department of Defense
DOE	Department of Energy
DQCR	Daily Quality Control Report
DQO	Data Quality Objective
EDD	Electronic Data Deliverable
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
ft	Feet
GIS	Graphical Information System
HAZWOPER	Hazardous Waste Operations and Emergency Response Regulations
HTRW	Hazardous, Toxic, Radioactive Waste
IA	Investigation Area
IDW	Investigation-Derived Waste
MDC	Minimum Detectable Concentration
MDL	Method Detection Limits
amsl	Above Mean sea level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NYSDEC	New York State Department of Environmental Conservation
pH	Potential of Hydrogen
PID	Photoionization Detector
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
RSO	Radiation Safety Officer
SAP	Sampling and Analysis Plan
SOW	Statement of Work
SSHM	Site Safety and Health Manager
SSHP	Site Safety and Health Plan
SSHO	Site Safety and Health Officer
SVOC	Semi-Volatile Organic Compound
USACE	U.S. Army Corps of Engineers
VOCs	Volatile Organic Compound

1.0 GENERAL

The U.S. Army Corps of Engineers (USACE) shall provide all contract and Governmental labor, material, and equipment necessary to perform the professional services described in this Sampling and Analysis Plan (SAP). The drilling Contractor shall furnish the required personnel, equipment, instruments, and transportation, as necessary to accomplish the required services. The analytical laboratory Contractor(s) shall provide all analytical services and produce electronic data deliverables (EDDs) that will be provided to the USACE for database population and analysis. The USACE will be the overall recipient of Contractor deliverables and ancillary data and supporting material. During the execution of the work, the USACE will perform Contractor oversight to ensure adequate professional supervision and quality control to assure the accuracy, quality, completeness and progress of the work.

2.0 SITE BACKGROUND

The sediment sampling behind the Springville Dam on Cattaraugus Creek will support the construction of dam modifications that will expand fisheries in the upper Cattaraugus Creek system. The dam was an electro-power facility that went off line in 1997 due to the costs required to upgrade and relicense the facility were not an efficient expenditure for the Village of Springville, who later deeded the facility to Erie County, NY.

The USACE requires sediment data to perform a beneficial use determination that will allow targeted excavation and re-use of approximately 20,000 cubic yards of sediment from behind the dam. The removal of this volume will also support construction (crest lowering) and the re-contouring of the creek bed to promote channel stability.

The dam is downstream of a rural watershed that also contains the Western New York Nuclear Service Center (WNYNSC), where the U.S. Department of Energy (USDOE) is conducting the West Valley Demonstration Project (WVDP). Consequently, sediment samples will be analyzed for chemical, radiologic, and physical constituents. The drilling Contractor will be responsible for sediment sample retrieval. The USACE will perform sample logging (material descriptions), selection, containerization, packaging and shipping; a laboratory results report and tabular database deliverable will be generated by the USACE.

This Sampling and Analysis Plan is prescriptive to ensure all stakeholder requirements are met.

2.1 SITE LOCATION

The Springville Dam is located along the border of Erie and Cattaraugus Counties, NY, just south of Springville, NY. Figures 1 and 2 show the site location and the upstream extents of the sediment sampling.

2.2 PREVIOUS INVESTIGATIONS

The USDOE via the WVDP environmental monitoring program and the NYS Department of Health (NYSDOH) periodically sampled the sediments behind the Springville Dam for over 25 years and 10 years, respectively. The results are summarized in the 2010 WVDP Annual Site Environmental Report (DOE 2011) and more comprehensively evaluated in the 2012 USACE Phase 1, Environmental Site Assessment. The 2012 USACE Phase 1 document was updated in 2015 to clarify language for the Project Partnership Agreement (PPA), thus referenced herein as USACE 2015. The USACE has not evaluated whether other sources for radionuclides are present in the upper Cattaraugus Creek watershed, but may assess this option per the results of the data-evaluation process discussed in Section 8.2.

In addition to the routine WVDP-centric sampling, s~~S~~ixteen (16) surface sediment sampling locations were sampled by USACE in 2007 for a wide array of chemical constituents, radionuclides, and metals. No evidence of contamination above human-health risk levels were encountered (USACE 2015~~07~~ includes these data).

The USACE contracted SOMAT in 2011 to collect 22 sediment samples in the Cattaraugus Creek ~~(Figure 3) (SOMAT, 2012). Samples were collected~~ using a vibracore, hand-auger, and ponar grab (Figure 3) (USACE 2015). Thirteen (13) surface sediment samples collected via ponar for grain-size analyses included locations that extended from the Town of Gowanda up-stream through the Springville Dam area and up to the Route 219 Bridge. Sample locations for chemical and radiologic constituents suffered from poor sample recovery due to coarse-grained textures, so only one sample was analyzed for chemical and radiological constituents. An 18-inch deep sample of finer grained sediment was taken from core location C6, which is immediately upstream of the dam. The C6 sample was tested for organochlorine pesticides, PCBs, chlorinated herbicides, reactivity-corrosivity-ignitability, reactivity of cyanide, metals, silver, antimony, mercury, semi-volatile organic compounds (sVOCs), percent moisture, TOC, reactivity/corrosivity/ignitability reactivity of sulfide, and radiological analysis. RTI Laboratories of Livonia, Michigan analyzed the sediment samples for all parameters except the radiological analysis, which was conducted by Outreach Laboratory of Broken Arrow, Oklahoma.

The resulting reports ~~(USACE 2015)~~ concluded that the dam sediments are not an ecologic or human-health risk to the construction worker that would perform the dam modifications (see Appendix 4 of USACE 2015).

The USACE and NYSDEC believe~~s~~ the sediment behind the dam may be partially scoured by high-volume, low-frequency flow events and replaced by new basin derived sediment. P~~In addition, p~~revious maintenance of the dam (at least through 1998) included routine (annual~~ly~~) ~~draining the pool to~~ flush~~ing~~ of accumulated sediment downstream to optimize electrical generation, thereby dispersing~~mitigating~~ potential accumulations within the creek channel below the dam~~of historic basin derived contaminants~~. The USACE and NYSDEC assume~~s~~ the surface sediment results from routine and USACE sampling ~~2007 to present~~ reflect a sediment surface at a point in time; the over 25 years of sediment sampling therefore represents an array ~~conditions deeper in the current~~ sediment levels (paleo-surfaces) ~~accumulations~~ behind the dam (i.e., a previous channel bottom overlain by newer sediments has been sampled throughout the accumulation period). The current sampling effort is designed to verify this assumption for sediment management purposes.

~~The USACE contracted SOMAT in 2011 to collect 22 sediment samples in the Cattaraugus Creek (Figure 3) (SOMAT, 2012). Samples were collected using a vibracore, hand-auger, and ponar grab. Thirteen (13) surface sediment samples collected via ponar for grain-size analyses included locations that extended from the Town of Gowanda up-stream through the Springville Dam area and up to the Route 219 Bridge. Sample locations for chemical and radiologic constituents suffered from poor sample recovery due to coarse-grained textures, so only one sample was analyzed for chemical and radiological constituents. An 18-inch deep sample of finer grained sediment was taken from core location C6, which is immediately upstream of the dam. The C6 sample was tested for organochlorine pesticides, PCBs, chlorinated herbicides, reactivity-corrosivity-ignitability, reactivity of cyanide, metals, silver, antimony, mercury, semi-volatile organic compounds (sVOCs), percent moisture, TOC, reactivity/corrosivity/ignitability reactivity of sulfide, and radiological analysis. RTI Laboratories of Livonia, Michigan analyzed the sediment samples for all parameters except the radiological analysis, which was conducted by Outreach Laboratory of Broken Arrow, Oklahoma.~~

~~The resulting reports (USACE 2015) concluded that the dam sediments are not an ecologic or human health risk to the construction worker that would perform the dam modifications.~~

3.0 PHYSICAL SETTING

The Springville Dam on Cattaraugus Creek is located in a steep-sided valley incised into shale bedrock; the location is accessed via Scoby Hill Road. Upstream of the dam and bedrock valley, floodplains are more prevalent and evidence of high flow is common (i.e., flood debris elevations). The Cattaraugus Creek watershed is rural and contains notable cold water fishing habitats. The expected sediment behind the dam will vary in texture (silt layers to loose silty gravel) and thickness (0 to 40 feet), thus the USACE shall prepare to collect sediment of such variable conditions. The depth of the creek will vary from less than two to over ten feet, thus sediment sampling will require a maximum lowering of the dam pool to allow standard drilling (hollow-stem augers) and/or direct penetration technologies (DPT or Geoprobe) access to the sediments.

The sampling will require low-water periods with minimal rainfall responses from the watershed, thus be constrained to the summer and early fall seasons, when soil-moisture deficits are highest (i.e., rainfall will be preferentially absorbed by soils).

4.0 SAMPLING RESPONSIBILITIES

The overall sediment sampling project organization and responsibilities are USACE and Contractor specific. The USACE Project Manager, technical field lead, sampling team (field crew), and Contractor (drilling) team will be familiar with sediment sampling in riverine systems, specifically the variable texture of likely samples.

The field activities executed during the sampling effort will follow a site-specific Abbreviated Accident Prevention Plan (APP) and abbreviated APP checklist in accordance with the requirements found in the "U. S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1" (30 NOV 2014), which is available on-line at:

http://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_385-1-1_2008Sep_Consolidated_2011Aug.pdf.

The Abbreviated APP shall have components designed to protect on-site personnel, the environment, and potential off-site receptors from an array of hazards that could arise during the execution of this plan (e.g., all hydraulic line connections on a drill rig will be inspected for leaks to preclude discharges to the riverine environment). If the project scope changes, the USACE will coordinate with the drilling Contractor and stakeholders to make appropriate changes to the Abbreviated APP. The Abbreviated APP will be reviewed by USACE Buffalo District Safety Office (DSO) for technical accuracy and compliance with USACE and OSHA regulations prior to performing any field activities. The Abbreviated APP shall be prepared following the format found in USACE publication U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual ER 385-1-1, Appendix A, Paragraph 2.

The following documents shall be considered in the preparation of the Abbreviated APP:

- USACE EM 385-1-1 (30 NOV 2014) *Safety and Health Requirements Manual*;
- UFGS-01 35 26 (April 2014) *Governmental Safety Requirements*
- USDOL OSHA 29 CFR 1910 *Occupational Safety and Health Standards*

All Contractor accidents involving injuries or property damage during the execution of this contract shall be reported to USACE within 4 hours of the contractor becoming aware of its occurrence. The initial USACE contact must be made personally (telephone or email messages only are not acceptable) to one of the following:

1. Contracting Officer: Frank D'Andrea
    a. Work Phone: (716) 879-4245
    b. Email: Frank.J.Dandrea@usace.army.mil

2. Project Manager: Geoffrey Hintz
    a. Work Phone: (716) 879-4155
    b. Blackberry: (716) 445-7722
    c. Email: Geoffrey.K.Hintz@usace.army.mil

Required Safety Submittals:

- Abbreviated APP
- Abbreviated APP Checklist (reference Appendix A, Safety Checklist, Forms and Reports)
- Activity Hazard Analysis (AHA) for the drilling Contractor (reference Appendix A)
- Engineering Form 3394 Accident Investigation Report **as incidents occur;** reference Appendix A, Safety Checklist, Forms and Reports available at: http://www.poa.usace.army.mil/Portals/34/docs/safety/ENGForm3394AccidentInvestigationForm.pdf

During the performance of work, the drilling Contractor shall comply with procedures prescribed for control and safety of persons visiting the site. Contractor is responsible for contract personnel and for familiarizing each of his subcontractors and visitors with safety requirements. Contractor shall advise the USACE Contracting Officer of any special safety restriction (e.g., corporate policy) so that Government personnel can be notified of these restrictions. The Contractor shall permit safety inspections of all work being performed.

5.0 PROJECT SCOPE AND OBJECTIVES

This section of the SAP describes project objectives, tasks, and schedule.

5.1. PROJECT OBJECTIVES

The principal goal of the sediment sampling effort is to obtain representative samples of surface and subsurface sediment that will be analyzed for chemical compounds and radionuclides to define whether the sediment exceeds potential risk standards and background levels common to the Cattaraugus Creek. The data will be used to determine whether the sediment is eligible for a case-specific BUD issued by the NYSDEC in accordance with 6 NYCRR Part 360-1.15(d).

The following steps will determine if sediment goals are met:

- Determine if contamination is present in sediments near the dam;
- Define the human-health and ecologic risks of constituents (above background and exposure); and
- Provide sufficient characterization data to obtain a BUD and progress with construction.

The NYSDEC Region 3 issued guidance regarding the upland disposal and management of dredge sediments; see http://www.dec.ny.gov/chemical/8734.html. This guidance recommends that undisturbed dredge cores (samples) be collected to represent the entire depth interval and the entire project area (or the

dredge prism). The sample requirements table within the guidance indicates that eight (8) samples should be minimally collected from a dredge prism ranging between 20,000 and 30,000 cubic yards, which is the range expected at the Springville Dam. To minimize the uncertainty associated with this project, the USACE recommends 11 locations that will yield four (4) samples each, or 44 primary samples (about 5-times the minimum), analyzed according to Tables 1 and 2. This will create a definitive data set for project risk definition and the beneficial use determination. Section 4.2 describes the sampling methodology.

5.2. TASK DESCRIPTION

The following section describes the field investigation results that the USACE and drilling Contractor must plan and execute using cost-effective methods.

The drilling Contractor shall provide the following plans to support project execution:

- Health & Safety Plan (for sample-collection and safety near water)
- Completed AHA

The USACE will provide previously approved Health and Safety Plans and AHAs as examples to optimize the contracted effort.

The sediment sampling method will include a USACE-contracted hollow-stem auger drill rig that will continuously advance a minimum diameter 2-inch split spoon sampler to collect sediment throughout the vertical profile at each targeted location (i.e., the USACE drilling contracts include options for larger diameter split spoons that would produce larger sample volumes to meet laboratory needs). Previous geotechnical sampling of fill and sediment adjacent to the dam indicates the sample retrieval method (wide-diameter split spoon) provides adequate sediment recovery and volumes. The USACE will specifically scope that the drilling contractor use a track-mounted or all-terrain vehicle (ATV) rig that can enter and maneuver in the creek channel and possibly on soft sediments. The contract will include a contingency option to place a temporary wooden platform atop soft-sediment areas to allow rig access to the location(s) (e.g., a temporary timber bridge common to stream-channel crossings at construction sites). The drilling rig must have the ability to self-evacuate from the creek channel on a daily basis (i.e., the rig will not be left in the channel at the end of each work day); a winch mechanism to support daily evacuation is desirable. This does not preclude a drilling contractor to propose an alternately effective platform to retrieve the samples (e.g., floating platform containing a drill rig).

Generally, sediment samples will be targeted and collected from all locations shown in Figure 2. These locations are intended to provide representative samples of the dredge prism (interior and exterior) outlined in Figures 1 and 2. The vertical profiling will be completed by combining three 24-inch split-spoon sample intervals (totaling 6 feet of penetration) into one field container (clean stainless steel bowl), which are then homogenized to emulate the mixing of dredge material during sediment excavation, ~~and~~ handling, dewatering, and transportation for disposition under a BUD. The USACE will not collect discreet vertical samples, but rely on the vertical 6-foot composites at each location to produce the ~~This~~ sediment volume that will ~~will~~ be placed into the respective laboratory containers. Sediment will not be composited between locations (e.g., sediment from intervals at SVD-SD001 will NOT be composited with intervals from SVD-SD002).

~~Since volatile organic compounds (VOCs) are not normally taken from homogenized samples, the VOC sample will be collected directly from a discrete sediment segment within the three split spoons from the targeted six-foot interval. Once all three split spoons are retrieved and screened with a PID, any sediment exhibiting a unique PID detection will be collected using a discrete sampling device, such as an Encore~~

~~sampler. If no unique PID detection is seen, then an interval will be chosen based upon professional judgement (e.g., finer grained interval or discolorations).~~

VOC (volatile organic compound) samples will be discreetly collected only if field screening instruments (e.g., photo-ionizing detector - PID) indicate chemical impacts in a segment of the split-spoon core; at that point, the USACE intends to employ En-Core or Terra Core (or alike method) to sample the discreet interval. Should the PID not detect VOCs in any of the three split spoons per composite interval, then the VOC sample will be collected from the composited sediment (as noted in Section 8.1).~~Since volatile organic compounds (VOCs) are not normally taken from homogenized samples, the VOC sample will be collected directly from a discrete sediment segment within the three split spoons from the targeted six-foot interval. Once all three split spoons are retrieved and screened with a PID, any sediment exhibiting a unique PID detection will be collected using a discrete sampling device, such as an Encore sampler. The current USACE drilling contract provides the option to use a 24-inch long split spoon, so the composite intervals will be 6-feet depth increments.~~

The planned intervals (totaling four at each 11 locations) are listed below and will be sampled for the chemicals and radionuclides listed in Table 1:

1. One composite sample derived from the homogenization of all sediment retrieved from the top three split-spoon samples (nominally zero 6.0 feet deep).
2. One composite sample derived from the homogenization of all sediment retrieved from the subsequent three samples (nominally 6.0 feet to 12.0 deep).
3. One composite sample derived from the homogenization of all sediment retrieved from the third set of three split-spoon samples (nominally 12.0 to 18.0 feet deep).
4. One composite sample derived from the homogenization of all sediment retrieved from the fourth set of three split-spoon samples (nominally 18.0 or 24.0 feet deep).

Geotechnical borings through the right bank plateau by the dam indicates that bedrock is at 1,067 ft elevation, which generally coincides with bedrock outcrop at 1,064 ft elevation downstream of the dam. The planned creek-bank and in-channel sampling locations appear to have topographic or bathymetric elevations varying between 1,080 ft and 1,090 ft. The sampling depths listed above indicate the full sediment wedge behind the dam will be penetrated to bedrock at all locations, thus conservatively characterizing a greater volume than is planned for excavation and re-use. This added information will provide flexibility during construction, especially if greater channel excavation or contouring is required.

The anticipated volume of sediment required to fill all laboratory-supplied containers for each method listed in Table 2 data should not be problematic with the 2-inch diameter (or greater) split-spoon sampler and composite sampling method. Should extremely poor sediment recovery occur at any given location, a nearby alternative location (nominally ±10 feet from the original) will be selected by the on-site USACE technical representative to meet project goals. High-percentage core recovery is a priority for the sampling program, thus core recovery and sample number will be maximized via contingency penetrations that will be included in the drilling contract. For example, the contract will have a specific number of optional penetrations that would be actuated during the drilling period in accordance with the Triad philosophy, which is available at the following link: http://www.itrcweb.org/Guidance/GetDocument?documentID=90.

Field reconnaissance of the dam area and previous bathymetry were used to place the locations on Figures 1 and 2 without deference to the potential thalweg of the creek once the dam pool is released for mobilization. Should a location be inaccessible (submerged in creek), a nearest available location will be chosen in a manner that maximizes areal coverage of the sampling configuration and proposed dredge prism. The on-site USACE representative will assist the drilling Contractor in identifying these field

locations. Real-time communication with the stakeholder group will be made to ensure concurrence, especially the NYSDEC representatives.

Grain-size analyses (ASTM D422) will be performed for each composite sample comprised of three split-spoon samples. This testing will include hydrometer analyses for samples containing significant amounts of material passing the #200 sieve. These analyses are listed on Table 2. The drilling contractor's inspector shall provide full time oversight of drilling operations, preparation of field logs, and collection and protection of grain-size samples. The on-site USACE representative shall supply the drilling Contractor with USACE-based geologic logs to supplement the Contractor borehole records. The drilling contractor shall combine these field records into boring logs using a version of gINT software, compatible with Version 8i Professional, using a library file provided by USACE. All grain-size data shall be included in the gINT project file.

5.3. SCHEDULE

The sediment sampling is based upon the following assumptions:

- The Right of Entry to the necessary properties is in place by mobilization.
- Sufficient funds are available to perform the work.
- All necessary subcontracts are in place at the time of mobilization.

If all of the above items are completed, it is anticipated that the field work will occur during the late summer or fall of FY17 (optimally the August-September 2017 timeframe), dependent upon dam-pool lowering and the quiescence of creek levels.

The period of performance of the drilling Contractor will be 90 calendar days, commencing on the date of Award, to ensure flexibility and success (i.e., account for potential delays due to creek flows).

5.4. Quality Control Plan and Independent Technical Review

5.4.1. Quality Control Plan

The USACE shall prepare and execute a single Quality Control Plan (QCP) to cover development of all products. The QCP describes the deliverables and the steps that shall be taken to control product quality and the Independent Technical Review (ITR) required under USACE processes. The QCP shall contain the following items, but shall not be interpreted as excluding others:

5.4.1.1. Management Philosophy. Discuss the organization's technical management philosophy relative to its commitment to quality, staff organization, and practices and procedures.

5.4.1.2. Management Approach. Define the specific management methodology to be followed during the performance of the work, including such aspects as documentation management and control, communications, design coordination

procedures, checking, and managerial continuity and flexibility. References to approved USACE policy and procedures are appropriate.

5.4.1.3. Management Structure. Delineate the organizational composition of the USACE team to clearly show the interrelationship of management and the execution team.

5.4.1.4. Project Risks. List and describe the risks inherent to the project that may affect quality.

5.4.1.5. Schedule. Project submittals and review periods on the USACE schedule will provide a critical path showing the sequence of events involved in carrying out specific tasks within the specified period of activity. Identify activities/tasks, their expected duration, both planned and actual accomplishments, along with any milestones to be met in order to successfully complete the work. Either Oracle Primavera or Microsoft Office Project software are preferred.

5.4.1.6. Communications. Discuss the methods by which clear and accurate communications are to be achieved within the organization, and outside the organization (especially during field mobilization).

5.4.2. Independent Technical Review

5.4.2.1. The USACE will perform an Independent Technical Review (ITR) of all key deliverables before they are submitted to the stakeholder group for review to ensure completeness and technical competence.

5.4.2.2. Performance of the ITR shall not be accomplished by the same personnel that produced the product and must have different supervision than those individuals producing the product to ensure that a truly independent technical review is accomplished. The ITR team member(s) shall be identified in the QCP.

5.4.2.3. It is understood that performance of the ITR on the work product may result in the generation of comments and/or concerns that would normally be addressed during subsequent finalization of the work product. These comments and/or concerns shall nevertheless be addressed in the final report.

6.0 NON-MEASUREMENT DATA ACQUISITION

Several types of non-measurement data will be reviewed by the USACE before and during the sampling event, such as historic documents, aerial photographs (orthophotos), geospatial (GIS) data, and land ownership parcels.

6.1. RECORDS REVIEW AND EVALUATION

The records that will be reviewed prior to mobilization include:

- Results from the 2007 and 2011 sediment sampling events;
- Electronic GIS files available from the USACE project team for planning and execution support.

The information will be used to plan site access and sampling execution, as well as serve as components in the sampling report.

6.2. DATA SUMMARY AND DATA NEEDS DETERMINATION

Previous analytical data generated in 2007 and 2011 indicated surface and near-surface sediments both upstream and downstream of the Springville Dam are not impacted with chemical or radiologic elements that pose a risk to human health and the environment. The USACE design package that serves as a basis for the stakeholder cost-share agreement, "Springville (Scoby) Dam Fish Passage Project – Detailed Project Report and Environmental Assessment" (USACE 2015) includes a Phase I Environmental Site Assessment as Appendix 4. This appendix provides a combined analysis of sediment, water, and fish data collected near the dam and determined that a Construction Worker receptor will not be exposed to hazardous or radiologic materials that would pose an unacceptable risk throughout construction.

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Comparative standards for chemicals include USEPA regional screening levels for both residential and industrial environments (USEPA 2012) and NYSDEC values for soil remediation (NYSDEC 2006). For radionuclides, the EPA's preliminary remediation goals (PRG) for both residential and outdoor workers were used (USEPA 2010). Like the chemical risk-based screening levels, these were developed to meet the lower end of the EPA's acceptable range of extra cancer risks, i.e., 1 in a million. The outdoor worker PRG assumes that a worker spends 8 hours a day, 225 days a year at the site for a total of 25 years whereas the residential soil PRG assumes that a person spends 24 hours a day, 350 days a year for a total of 30 years at the site. The construction at the Scoby Dam is not expected to last longer than 18 months, so the Construction Worker would not be exposed to unacceptable risk.

This sediment sampling event~~study~~ will confirm that the same conditions exist at greater depths and aerial extent. Additional geotechnical data will be collected to further identify sediment characteristics that are related to design components (i.e., slope stability, erodibility, and compaction).

The work product will be considered definitive and provide the information needed to determine path-forward actions (i.e., compile BUD documents and actuate project construction).

7.0 PRELIMINARY DATA QUALITY OBJECTIVES

This section presents preliminary data quality objectives (DQOs) for this sediment sampling event. Formal DQOs are structured according to EM 200-1-2 *Technical Project Planning Process* (USACE 1998), which incorporates the basic components of the seven-step DQO process described in *Guidance for the Data Quality Objective Process* (USEPA 1994).

Additionally, EM 200-1-3 *Requirements for the Preparation of Sampling and Analysis Plans* and EM 1110-2-4000 *Sedimentation Investigations of Rivers and Reservoirs*(e.g., Form ENG 1787) will be employed to guide the sampling effort.

This event will employ a subset of the DQO process for the sediment screening for potential contaminants and design data needs; these processes include:

- Identify the current project;
- Determine project data needs;
- Develop data collection options; and
- Finalize the data collection program.

The following sections summarize these four phases.

7.1. IDENTIFY THE CURRENT PROJECT

Summaries of site-specific operational and environmental information gathered during fact-finding meetings and local environmental experience indicate the following:

- The dam was operated by the Village of Springville until 1998, when it was deeded to Erie County;
- Previous sediment sampling results did not indicate risks from contamination;
- The sediment behind the dam was routinely flushed and replaced with basin sediment;
- Environmental artifacts of historic discharges from basin sources may exist in the sediments, which, if discovered, may require follow-on action (e.g., more targeted sampling or remedial actions by a responsible party).

This sampling effort is designed to obtain analytical data to confirm that no chemical and radiologic constituents exist, along with physical characteristics important to future construction efforts.

7.2. DETERMINE DATA NEEDS

The project-specific data will be collected for and by the USACE to confirm chemical and radiologic contamination does not exist above risk-based and background levels for sediment common to the Cattaraugus Creek system, as outlined in Table 3. The vertical sampling data will be used to determine whether project-related sediment can be beneficially used as land-surface grading material at an upland site via a case-specific BUD issued by the NYSDEC in accordance with 6 NYCRR Part 360-1.15(d). The use of risk-based and watershed-background criteria are requested by NYSDEC to support the 6 NYCRR Part 360 determination and assess appropriate compliance with 6 NYCRR Part 380 criteria (radiologic materials handling and disposition).

7.3. DEVELOP DATA COLLECTION OPTIONS

General sediment sampling and analysis employs industry-standard practices and USACE guidance. Subsequent sections describe the following components:

- Data collection methods
- Sample location reasoning
- Number of samples needed to meet project objectives
- Analytes and characteristics of interest
- Analytical methods employed
- Method detection limits and quantitation limits
- Data report with tabular database

Data collection options may be modified by the on-site USACE representative if site conditions or project data warrant change during the course of the sediment sampling. Project stakeholders will be informed of such modifications (e.g., a storm event requires sample-point movement, access to a sample point becomes impossible due to geomorphic or structural reasons, a sample-point location poses unsafe conditions, etc.).

7.4. FINALIZE DATA COLLECTION PROGRAM

Project data needs required by the USACE are listed in Table 2 and include the following elements:

- Rationale
- Radiologic parameters
- Sample location map reference
- Number of sample locations
- Total number of samples

Where possible, proposed sample locations were chosen to provide data that will satisfy project needs and minimize, to the extent possible, field and laboratory analytical costs. In general, these sediment sampling locations can be considered observational, as opposed to targeted or confirmatory (assumes contamination identified previously). The field sampling and analytical laboratory methods used for the Springville Dam project must meet USACE standards and, in general, CERCLA requirements for risk assessments and site characterization reports. The data will be considered definitive and useable in decision making.

Numerous field photographs will be generated during the sampling activities. Digital cameras will be utilized to allow for regular downloading and backup. Field photographs will be logged for future use and routinely transferred to the USACE servers for storage.

8.0 SITE INVESTIGATION FIELD PROCEDURES

The following sections present specific procedures and detailed information associated with the sediment investigation. All samples will be analyzed by a NELAP accredited lab with hazardous and radiologic materials licenses and samples will have a 21-day turn-around period. The USACE Buffalo District has a standing task-order contract with RTI Labs of Livonia, MI (chemicals) and Pace Analytical of Greensburg, PA (radiologic). QA/QC samples will accompany the primary samples.

Tables 1 and 2 present the analytical methods to be used and subsequent sections detail the analysis needs.

8.1. DATA QUALITY CONTROL

The following analytical (laboratory) data quality controls will be used during sediment sampling and subsequent data-quality analyses (see Table 2 for summary):

- A minimum of ten percent field duplicate samples (eight) and five percent field QA split samples (four) will be collected for field quality control purposes (only for analytical laboratory samples).
- A minimum of five percent matrix-spike/matrix-spike duplicates (MS/MSD) will be collected for laboratory quality control purposes (only for analytical laboratory samples).
- Laboratory precision will be determined by comparison of QA split and field duplicate sample values with an objective of a relative percent difference of 30% or less at 50% of the criterion value when reported activities are greater than five times their minimum detectable activities (MDAs); if sample results are less than five times their respective MDA, the normalized absolute difference (NAD) will be used with an objective of NAD less than 1.96.
- Accuracy will be plus or minus (±) 30 percent at 50 percent of the screening level value.
- The percentage of data acceptable for use will be 90 percent or higher.

The total number of primary sediment samples planned for collection is 44 for each analytical test and 44 for physical (grain-size) tests. The discreet samples will be assessed for eight (8) field duplicates and the composite samples for four (4) split samples to ensure QA needs. Table 2 presents the number of QA/QC samples to be collected to meet the minimum data quality control measures commonly required under

CERCLA guidance (a relevant guidance for this project). The QA/QC samples were "rounded up" to ensure that data quality can be defended in subsequent decision documents.

Sediment obtained from the subsurface intervals (individual split spoons) will be screened with the following field instruments ~~This screening step will occur when the sediment is exposed in the split spoon device and~~ prior to homogenizing into a clean stainless steel bowl, as discussed in ~~(see~~ Section 4.2~~)~~.

~~:~~

1. P~~p~~hoto-ionizing detector (PID) to detect volatile organic compounds ~~chlorinated solvents~~ or alike chemicals;
2. Geiger-Mueller meter to detect alpha, beta, and gamma radiation; and
3. Sodium-iodide (NaI) scintillation detector to ~~optimally~~ detect gamma radiation.

The USACE also will consider the use of an alpha-beta phosphor sandwich (or phoswich) detector to distinguish between alpha and beta signatures in total radioactivity; such instruments include Ludlum 43-89 or 43-93 series detectors.

The intent of the chemical and radiological scanning is three-fold:

1. Indicates where discrete VOC sampling may occur (see Section 5.2).
2. Provides on-site health and safety monitoring of working conditions that may affect sample retrieval and handling (e.g., should personally protective equipment be upgraded), and
3. Indicates where samples may produce above-background laboratory results that are integral to project planning (e.g., provides evaluation targets when the results are delivered by the lab).

The Geiger-Mueller meter is the primary device expected to recognize field radioactivity and provide decision-making capabilities for the field staff, whereas the NaI scintillation detector simply provides a secondary check that is not part of the safety decision-making process. The USACE plans to employ in-house (Federal) Health Physicists to self-execute the scanning (and support sample preparation). Field scanning results will be recorded in 6-inch to 1-foot intervals on the boring logs depending on observed variation or homogeneity of the readings (i.e., more variation equates to 6-inch intervals).

To identify "site background" radiation levels for soils, the USACE normally selects an uncontaminated site reference area that is scanned daily to provide a statistical mean for observed background (alpha, beta, gamma) and associated standard deviation. This daily approach accounts for temperature and humidity variations that may influence meter performance. The USACE commonly defines an above-background detection as the average of the reference area plus two standard deviations; past experience indicates this value may be represented also as a multiple of the average during field execution. For example, field scanning of construction and soil-like materials at project sites under the Formerly Utilized Sites Remedial Action Program (FUSRAP) have used X.X- to Y.Y-times (verifying at press – 18-JUL-2017) the reference average to bound background-level radiation for waste disposition. In this case, a NYSDEC BUD for sediment re-use.

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~~This screening step will occur when the sediment is exposed in the split spoon device and prior to homogenizing into a clean stainless steel bowl (see Section 4.2).~~

Upon completion of field scanning and sediment compositing, s~~S~~ample jars/containers will be filled with the homogenized sediment in the order of most volatile to least:

1. Volatile Organic Compounds (VOCs) – Unless uniquely detected by PID per Section 5.2
2. Semi-volatile Organic Compounds (SVOCs)

3. PCB (Aroclors)
4. Pesticides
5. Radionuclides
6. TAL metals
7. Mercury
8. Cyanide
9. Total Organic Carbon

~~Since volatile organic compounds (VOCs) are not normally taken from homogenized samples, the VOC sample will be collected directly from a discrete sediment segment within the three split spoons from the targeted six-foot interval. Once all three split spoons are retrieved and screened with a PID, any sediment exhibiting a unique PID detection will be collected using a discrete sampling device, such as an Encore sampler. If no unique PID detection is seen, then an interval will be chosen based upon professional judgement (e.g., finer grained interval or discolorations).~~

The 6-foot composite sample for grain-size analyses, as discussed in Section 4.2, will be packaged from the balance of the homogenized sediment that remains after analytical samples are taken.

The trowels and bowls will be cleaned after completion of each location in accordance with industry protocols (e.g., an Alconox wash and thorough rinse with de-ionized water, then paper towel dry).

8.2. PROJECT INVESTIGATION LEVELS/SCREENING LEVELS

The initial exposure risk and radiologic background criteria to be used for screening the analytical results are~~-~~ summarized in Table 3. These criteria will be used to provide approval of the case-specific BUD; chemical criteria are guidance-based or promulgated, whereas the radiologic criteria are derived from WVDP-specific sampling analyzed in the 2012 WVDP Annual Site Environmental Report (ASER Tables F-2D and F-2E). The primary screening ranges for radionuclides reflect Cattaraugus Creek sediment background (10-year averages) at the Bigelow Bridge location, whereas the secondary screening criteria reflects background soils near a distal air monitoring station.

The radiologic sampling ~~radiologic~~ results will include~~be screened against the WVDP-specific radionuclides that are listed for sediment in the 2012 WVDP Annual Site Environmental Report (ASER Table F-2E). T~~ the entire gamma-spectroscopy library noted on Table 1, although only ~~will be reported by the laboratory, but only WVDP-related radionuclides noted below Table 1 and listed~~the radionuclides listed in ~~on~~ Table 3 will be assessed for the BUD. This narrower list focuses on available comparative data (2012 WVDP ASER) that are signature contaminants at the WVDP. Both gross alpha and gross beta radiation are included in Tables 1 and 3. These results will be compared to the summary of individual alpha and beta emitting radionuclides to assess whether other radionuclides are present at unusual concentrations in the sediment samples. For example, if the summary of alpha-emitting radionuclide results in a sample is much smaller than the gross alpha result, then a non-sampled alpha-emitting radionuclide may occur in the sediment, which may be retested for additional alpha-spectroscopy results.

The comparison of chemical sampling results to acceptable chemical concentrations referenced in Table 3 will be a "value to value" for the BUD (e.g., lead results will be compared to allowable lead values). However, the radiological sampling results will be compared to the background range provided in Table 3 (e.g., average K-40 background for sediment is 13.7+1.5 pCi/g, so a value up to 15.2 pCi/g is considered background). Data comparison tables will be compiled and USEPA tools, such as ProUCL, will be

employed to evaluate the overall sampling dataset against the background ranges (e.g., do the sample and background data ranges represent similar populations). This is important for the BUD application since NYSDEC requires beneficially re-used material to reflect background ranges for radionuclides, rather than site-specific risk-based analyses.

If chemical and/or radionuclide results exceed the screening criteria, then the NYSDEC (and secondarily other stakeholders) will be notified, which would lead to discussions with USACE management, who may re-evaluate project risk and act accordingly (e.g., suspend project work and communicate USACE options with the land owner or other responsible parties).

The USACE laboratories (RTI and Pace) will be contracted to meet detection levels for all analytes to ensure the results can 1) meet DQOs, 2) be compared to referenced standards & guidance, and 3) be used in screening-level risk assessments (human and ecological). Should the radiologic laboratory be unable to meet a detection criteria listed in Table 3 for a specific methodology listed in Table 1, than an alternate method will be assessed to achieve desired results (e.g., should alpha spectroscopy not achieve a radiologic background value, then ICP-MS may be assessed and the mass-based results would be converted to activity results via specific activity).

9.0 FIELD MEASUREMENTS

Field measurements to be performed during the sampling effort include the screening of sediment cores and sediment-contact materials (split spoons) with chemical and radiation detectors that are discussed in Section 7.1. This step will allow the USACE to bias the VOC samples and plan for the disposal of unsampled sediment. Remaining sediment will be containerized (drummed) as investigation derived waste (IDW) until the analytical data are evaluated and logical disposition can be arranged (e.g., shipped as a waste product or spread in the project area.

All sampling locations will be surveyed via GPS to sub-meter levels and the coordinates shall be provided in New York State Plane, NAD1983, FIP 3103. The sampling log book or collection record/form shall contain these coordinates; the coordinates will be included in the database deliverable and report.

9.1. SAMPLE COLLECTION, CONTAINERIZATION AND PRESERVATION

Sediment sampling (retrieval), sample homogenization, sample containers, chemical preservation techniques, and holding times for sediment samples are described herein. The specific number of preserved and unpreserved containers required for this study will be estimated and supplied by RTI and Pace Laboratories upon contractual agreement. Additional sample volumes will be collected and provided for laboratory QC protocols (field and laboratory duplicates).

All filled sample containers will be preserved, if applicable, according to standard laboratory protocols (and standard methods) to ensure sample integrity. In the event that sample integrity, such as holding times, cooler temperatures, etc., is compromised, re-sampling will occur as directed by the on-site USACE representative or Project Manager (i.e., the risk of data loss or lower quality data will be assessed).

Sediment coring will be the responsibility of the drilling Contractor, whereas core and sample descriptions, retrieval, packaging, and shipping to the laboratory is USACE responsibility. The drilling Contractor will assume responsibility of the grain-size analysis samples and generate the deliverables

discussed at the end of Section 4.2, in coordination with the USACE. The drilling Contractor will work with the on-site USACE representative to ensure sufficient retrieval of the sampling interval in the field.

Tables 1 and 2 list the sampling program requirements and laboratory protocols.

9.2. SAMPLE PACKAGING AND SHIPPING REQUIREMENTS

The following section describes common sediment sample packaging and shipping requirements for sediment sampling projects.

9.2.1. Sample Packaging

Sediment sample containers will be packaged in thermally insulated coolers that are sealed with evidence tape and shipped in accordance with applicable DOT and USACE specifications (e.g., EM 200-1-3). Packaging and shipping procedures should minimally include the following:

- All individual sample containers will be sealed with screw tops.
- Each sample container will be wrapped in or placed inside a bubble-wrap or similar protective wrap.
- Each sample container, or small groups of containers, will be placed into a plastic bag that will then be devoid of excess air and sealed.
- Trip blanks are required when shipping VOC containers; temperature blanks will be included in all cooler shipments.
- Each sample container will be placed upright in the shipping cooler along with wet ice sealed in double plastic bags that will be placed around, among, and on top of the sample containers.
- Inert packing material (such as bubble wrap) will be placed into the cooler, if required, to prevent shifting of the sample containers during transport.
- All required laboratory paperwork, including the Laboratory Chain of Custody (COC) form(s), will be placed inside a plastic bag and taped to the inside of the cooler lid. If a laboratory provided courier is used, the paperwork will be attached to the outside of the cooler to facilitate exchange of sample custody.
- Upon completion of the packing process, the cooler lid will be sealed with strapping tape and two signed & dated custody seals will be placed on the cooler, one across the front and one across the side.
- The air bill for the shipment (when applicable) will be completed and attached to the top of the shipping box/cooler or handle, which will then be transferred to the courier for delivery to the laboratory.

The above checklist is suggested for packing and shipping environmental samples to verify the completeness of sample shipment preparations.

9.2.2. Sample Shipping

Sediment samples collected during the project will be shipped as soon as possible, normally the same day as sample collection. Samples may be held in a secure area for a longer period of time, provided that analyte-specific holding times are not jeopardized, especially for VOCs. During the time period between collection and shipment, all samples will be stored in ice-filled coolers and maintained in a secure area to control the chain of custody. All coolers containing sediment samples will be shipped overnight to the laboratory by commercial or laboratory courier. Chains of custody (USACE copy) shall be maintained by the USACE field team during mobilization (this team will include a Project Chemist).

10.0 CHEMICAL QUALITY CONTROL

This SOW section summarizes the chemical quality control program that will be implemented for the sediment sampling program.

10.1. QUALITY CONTROL PROGRAM

The Quality Control (QC) Program should consist of three phases: the preparatory phase, the initial phase, and the follow-up phase, as discussed below.

10.1.1. Preparatory Phase

The preparatory phase of the QC program will be conducted by the USACE prior to beginning each definable feature of work. A summary of all activities performed during each preparatory phase meeting will be documented and address the following:

- Review of all pertinent sections of the SAP and other work plans to ensure that all field personnel are cognizant of the data quality objectives, specific project activities to be accomplished, and specific sampling and analysis requirements.
- Review of calibration procedures for all instruments to be used for measurement of field parameters, where applicable.
- Physical examination of all materials and equipment required to accomplish the specific project activities.
- Review of equipment decontamination procedures in accordance with CERCLA-level protocols.
- Review of how each sample is to be collected, containerized, documented and packaged.
- Review of proper IDW management and documentation.
- Review of the procedure for completing all required information to be recorded on sample custody forms, and discussion of the project sample numbering system.
- Review/discussion of any other activities to be performed as necessary by the USACE-QC representative or project team.
- Examination of the work area(s) to ascertain if all preliminary work is complete.
- Review of preparatory phase field equipment and support materials checklists.

10.1.2. Initial Phase

The initial phase of the USACE-led QC program will include the following:

- Inspection of sampling equipment for cleanliness and adequate supply.
- Inspection of individual sample labels and COC forms for accuracy, completeness, and consistency.
- Inspection of sample packaging and shipping activities.
- Observation, verification, and documentation of initial and ongoing field instrument calibration.
- Routine review of field logbooks/forms and other field records/sketches to assure that all pertinent data are recorded in accordance with project requirements.
- Inspection of the QA sample match-up table to ensure that all samples collected during each day are properly documented.

10.1.3. Follow-up Phase

The follow-up phase of the QC program will include USACE/drilling Contractor meetings to fine tune the performance of the various field activities until all work components are completed.

11.0 FIELD OPERATIONS DOCUMENTATION

This section of the SAP describes the field documentation that will be maintained during the sediment sampling field work.

11.1. DAILY LOGBOOK AND QUALITY CONTROL REPORTS

The USACE field team will maintain a daily logbook and/or binder of field forms of field investigation activities that will be available for QC inspection.

When a sample is collected or a measurement is made, a detailed description of the location will be recorded. The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, volume, and number of containers. A sample identification number will be assigned before sample collection. Field duplicate samples and QA split samples, which will receive an entirely separate sample identification number, will be noted under sample description. Equipment employed to make field measurements will be identified along with their calibration dates and daily background readings.

This logbook will be the basis for the preparation of a Daily Quality Assurance Report (DQAR) for the USACE Project Manager upon request; this report also may be a simple email from the USACE field team leader and/or drilling contractor, if requested. The DQAR will include a summary of activities performed at the project site, weather information, results of the team activities, departures from the approved SAP, problems encountered during field activities, and any instructions received from USACE project-team representatives. The drilling Contractor shall report to on-site USACE representative any deviations that may affect the project data quality objectives.

11.1.1. Photographs

All sample locations will be documented on film or with a digital camera. For each photograph taken, the following items will be noted in the field logbook and/or on the sampling or geologic logging form:

- Date
- Time
- Sample location ID
- General description of the subject
- Sequential number of the photograph.

After the pictures are downloaded, the photographer will review the photographs and compare them with the photographic log to confirm that the log and photographs match.

11.2. SAMPLE DOCUMENTATION

This section describes the sample documentation requirements that will be followed during the field sampling activities associated with sediment sampling.

11.2.1. Sample Numbering System

A sample numbering system will be used to enable the efficient tracking and management of all samples and the resulting laboratory and/or field analytical data. Each sample will be assigned a unique alpha-numeric sample number and a sample station location. Each sample number will include a matrix-specific code and a unique numeric code. Numeric codes will run consecutively through the entire course of the project and will never be re-used for the same sample matrix. Separate groups of numeric codes will be used for regular field samples, USACE QA split samples, and field duplicate samples for ease of identification and tracking in the field.

Sample station locations will include a project code in addition to matrix and numeric codes. As with sample numbers, each sample location station will be unique and will not be repeated throughout the course of the sampling. The following sections describe all of the components of the sample numbering system and provide examples of sample numbers and sample station locations; these are considered guidance.

11.2.1.1. Sample and Location Numbers

The database will include both sample location indicators and associated unique sample identifiers for the samples from each location.

- Project ID Code: SVD (for Springville Dam)
- Sample Matrix Codes: SD - Sediment
- Sample Numbers: 0001 - 7999 Regular field samples
- 8000 - 8999 Field QA split samples
- 9000 - 9999 Field duplicate samples
- Depth: 0-0.5 (representing zero to one-half foot depth)
- Example: Second sediment sample location, 0 to 6 feet deep: SVD-SD0002-0.0-6.0

Should a location and depth require a twinned boring at a specific depth to achieve sample volume requirements, the combined media shall have the same identifiers, although the twinning will be recorded on field logs and/or forms.

11.2.2. Sample Labels

Labels will be affixed to all sample containers during sampling activities. Some information may be preprinted on each sample container label. Information that is not pre-printed will be recorded on each sample container label at the time of sample collection. The information to be recorded on the labels will be as follows:

- USACE name (customer)
- Sample identification number (as previously discussed)
- Analysis to be performed (commonly pre-printed on lab containers)
- Type of chemical preservative present in container (commonly pre-printed on lab containers)
- Date and time of sample collection
- Sampler's name or initials

11.2.3. Chain-of-Custody (COC) Records

It is USACE policy to follow EPA policy regarding sample custody and COC protocols as described in *NEIC Policies and Procedures* (EPA 1985). This custody is in three parts: sample collection, laboratory analysis, and final evidence files. Final evidence files, including originals of laboratory reports and electronic files, are maintained under document control in a secure area. A sample or evidence file is under an individual's custody when it is:

- In your possession,
- In your view, after being in your possession,
- In your possession and you place them in a secured location, or
- In a designated secure area.

In addition to the COC record, there is also a COC (custody) seal. The COC seal is an adhesive seal placed in areas such that if a sealed cooler is opened, the seal would be broken. The COC seal ensures that no sample tampering occurred between the field collection and laboratory analysis.

12.0 DATA MANAGEMENT

The data management activities performed by the USACE will include the planning, collection, tracking, verification, validation, analysis, presentation, and storage of site characterization data to ensure high-quality laboratory data reporting. The characterization data will be a manageable amount of information that will influence the course of future activities. The information collected will provide the foundation for determining the presence of contamination in site sediments and the constructability of the dam project.

All electronic data stored solely on field instruments or computers will be downloaded and backed-up on removable storage media (such as a compact disc or DVD) or uploaded to the USACE network system on a daily basis during work periods. This will ensure that computer loss or failure will not destroy or corrupt project data.

12.1. INVESTIGATION DATA

Any mapping data (i.e., GPS locations of sampling points) will be compiled in a site base map to identify discrete sediment sampling locations. The base coordinate system for the characterization work is New York State Plane in feet (FIPS 3103) and topographic data will be reported in North American Vertical Datum (NAVD 1983) in feet. A project geodatabase will be created and managed through ArcGIS (version 10.2 or later).

The sediment data will be delivered under hardcopy and electronic format (laboratory electronic data deliverable or EDD). The number of samples and resulting parameter records will be handled via spreadsheet analyses software, such as Microsoft Excel, for the data validation process. The final validated data will then be imported into the overall project database (likely Microsoft Access based), which will be the basis for data reporting and GIS interfacing (via geodatabase links).

Chemical and radiological screening data, including PID and field radiologic metering of the sediment cores, will be recorded in appropriate field logbooks/boring-log forms, all of which will be submitted to the stakeholder group at project completion (via project data report).

12.2. CRITICAL PROJECT RECORDS

Critical project records such as survey reports, COC forms, laboratory data packages, and verification results will be maintained by the USACE. The final project geodatabase and analytical database will be shared with the project stakeholders. To meet this requirement, a data management process will be followed throughout the collection, management, storage, analysis, and presentation of the site environmental characterization data.

12.3. SAMPLING AND ANALYSIS PLANNING

The USACE field personnel shall have all the required training to execute the project and maintain records. These activities ensure that standard procedures will be followed when using boring log forms, sample collection field logbooks/sample forms, COC forms, labels, and custody seals.

The master field investigation record will include the site field logbook/sample forms that will record each day's field activities, personnel on each sampling team, and any administrative occurrences, conditions, or activities that may have affected the field work or data quality of any sediment samples for any given day.

As samples are collected in the field, sampling team members will complete the logbooks/forms with sample collection data and required field measurements.

Completed logbooks and appropriate field forms will be electronically scanned and submitted to the project file upon completion of the project. The digital files will be stored on a USACE network and become part of the electronic deliverable to the project stakeholders.

12.4. CHAIN-OF-CUSTODY (COC) DOCUMENTATION

Sample containers will be tracked from the field collection activities to the analytical laboratory following proper COC protocols and using standardized COC forms (normally lab-specific).

The USACE contracts with RTI and Pace Laboratories require full sample tracking: 1) samples are received at the laboratory, 2) the laboratory receiving staff will check and document the condition of the samples upon arrival, 3) check that the sample identification numbers on containers and chain of custody forms match, and 4) assign laboratory sample identification numbers traceable back to the field identification numbers. Within 24 hours of receipt of the sample containers, the laboratory will send a letter of receipt (or email) to the USACE contract representative (normally project chemist). This letter provides the following information:

- Sample receipt date
- Problems noted at the time of receipt (if any)
- List of sample identification number and corresponding laboratory identification numbers for all samples received
- Analysis requested for each sample received
- Completed cooler receipt checklists for each cooler received

The letter/email of receipt will be accompanied by the completed and signed COC form(s) for the samples (scanned attachments with an email), and both documents will be submitted to the project file. This process allows the tracking of samples from the time of collection through analysis and verification.

12.5. ANALYTICAL LABORATORY DOCUMENT AND DATA SUBMISSION

The USACE shall ensure data quality by reviewing data packages for precision, accuracy, and completeness and will attest that it meets all data analysis and reporting requirements for the specific method used, including detection limits and practical quantitation limits.

Laboratories shall prepare and submit analytical and QC data reports, where applicable. All electronic copy of data (EDDs) shall be provided as a hierarchical text file consisting of the required data elements, usually in XML format. The USACE is responsible for data formatting for reporting and later use.

12.6. DATA VERIFICATION AND REVIEW

Data verification and validation will be performed on all sample data. Data packages received from the analytical laboratory will be validated per CERCLA guidance. A full EPA Level II validation will be performed by the USACE project chemist and the analytical data will be flagged accordingly in the project database.

12.7. DATA CENTRALIZATION AND STORAGE

The USACE shall cross check all sample data with logbooks and other field records to ensure analytical data packages are complete and accurate in the digital database.

12.7.1. Data Summarization and Reporting

Project data will be screened for potential data errors and corrected to facilitate data interpretation (e.g., ensure location identifiers are properly linked to associated analytical data). Data reduction and summation will be accomplished using quality-controlled and documented reporting software programs (e.g., Microsoft Excel or Access).

12.7.2. Records Management and Document Control

Hard copies of all original site and field logbooks, COC forms, data packages with analytical results and associated QA/QC information, data verification forms, and other project-related information will be indexed, catalogued into appropriate file groups and series, and retained by the USACE. A sample tracking database or spreadsheet will be created to ensure laboratory delivery, analysis, and results are fully accounted for during the post-sampling phase.

Sufficient documentation will accompany the archived data to fully describe the source, contents, and structure of the data to ensure future usability. Noncommercial computer programs used to manipulate or report the archived data will also be included in the data archive information package to further enhance the data's future usability.

13.0 INVESTIGATION-DERIVED WASTE MANAGEMENT

The USACE is responsible to control and dispose of any investigation derived waste (IDW), including materials generated during performance of an investigation that cannot be effectively reused, recycled, or decontaminated in the field. IDW consists of materials that could potentially pose a risk to human health and the environment (e.g., sampling and decontamination wastes) as well as materials that have little potential to pose risk to human health and the environment (e.g., sanitary solid wastes). ~~Although existing data do not indicate contamination exists at concerning levels, IDW (mainly sampling residuals) will be containerized (drummed) and sample-specific analytical data will be used to disposition sediment IDW in concurrence with NYSDEC (e.g., licensed commercial disposal or spread in the project area).~~ Although existing data do not indicate contamination exists at concerning levels, IDW (mainly sampling residuals) will be containerized (drummed) and sample-specific analytical data will be used to disposition

sediment IDW in concurrence with NYSDEC (e.g., licensed commercial disposal or spread in the project area).

14.0 DELIVERABLES

The sediment sampling for the Springville Dam project will require a final data report and electronic database of results. The sampling results, both analytical and physical, shall be delivered in a format that allows the USACE and project stakeholders to efficiently evaluate sediment quality and characteristics.

The USACE will compile and maintain a critical path method (CPM) schedule (via Oracle Primavera or Microsoft Project) to best forecast project-component start and completion dates, duration of each item on the schedule, projected manpower to perform the work, critical activities, and milestones.

The drilling Contractor and the USACE shall maintain daily quality control and safety logs for each field day. These records shall identify the current activities, any unanticipated delays or occurrences, and any needed corrective actions.

15.0 SUBMITTALS

All reports presenting methods and data shall be prepared in the following standard format.

- All site drawings shall be of engineering quality with sufficient detail to show interrelations of major features on the site map (i.e., north arrows, keys, scales, etc.)
- When drawings are required, data shall consist of 8-1/2-inch by 11-inch pages, with larger drawings folded to this size.
- A decimal paragraphing system shall be used. The reports shall be submitted in three-ring hardcover binders. A report title page shall identify the report title, the USACE, Buffalo District, and the date.

Report hard copies will be accompanied by electronic submittals in Adobe Acrobat Portable Document Format (PDF). All original (native software) files, including, but not limited to, documents and databases, shall be provided to the stakeholder group by the USACE. Original files shall include working copies of any documents/data in the appropriate Microsoft format (i.e. Word, Excel, Access, etc.). Documents shall be screened for potential violation of the 1974 Privacy Act prior to submittal (e.g., redaction of signatures, personally identifiable information, purchase records, etc.).

16.0 PROJECT PROGRESS REPORTING

16.1. Progress Reporting / Meetings

The USACE shall initiate and conduct a biweekly telephone conference calls with the stakeholder group to discuss work status and progress during the field mobilization. The USACE shall summarize the meetings and distribute to all involved parties not more than five working days later.

17.0 PUBLIC AFFAIRS

The USACE Project Manager shall be the project voice for the news media or publicly disclose any data generated or reviewed under this plan.

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USEPA, 2012. Regional Screening Levels (RSL) Summary Table. November 2012. http://www.epa.gov/reg3hwmd/risk/human/rbconcentration_table/Generic_Tables/pdf/master_sl_table_run_NOV2012.pdf

~~USACE, EM 200-1-2 Technical Project Planning Process (1998)~~

~~USACE, EM 200-1-3 Requirements for the Preparation of Sampling and Analysis Plans~~

~~USACE, EM 385-1-1, Safety and Health Requirements Manual (30 NOV 2014).~~

~~USACE, EM 1110-2-4000 Sedimentation Investigations of Rivers and Reservoirs, ENG 1787~~

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T A B L E S

TABLE 1. SPRINGVILLE DAM ANALYTICAL REQUIREMENTS FOR SEDIMENT

Analytical Group	Analytical Method
Gamma Spectroscopy Suite @ (Cs-137 Primary Analyte)	HASL 300 Gamma Spectral Method GA-01-R (EPA 901.1 Equivalent)
Strontium-90 *	ASTM C1507-07e1 or EPA 905.0
Total Uranium (elemental) *	KPA - ASTM D5174
Isotopic Plutonium (Pu-238, Pu-239/240) *	Alpha-particle Spectroscopy DOE EML HASL 300 Series
Uranium-232, -234, -235, -238 *	Alpha-particle Spectroscopy DOE EML HASL 300 Series
Gross Alpha	EPA 900.0/9310
Gross Beta	EPA 900.0/9310
TAL Metals (23 Analytes), Hg, Zn	6010 (B)
Volatile Organic Compounds (VOCs)	EPA 8260 (B)
Semi-volatile Organic Compounds (SVOCs)	EPA 8270 (C)
Pesticides	EPA 8081A
Herbicides	EPA 8151A
PCBs (Aroclors)	EPA 8082
Total Organic Carbon (TOC)	EPA 9060

NOTES:

@ Gamma spectroscopy report will include the following library of radionuclides:

Actinium−228	Lead−210
Americium−241 *	Lead−212
Antimony−124	Lead−214
Antimony−125	Manganese−54
Barium−133	Mercury−203
Barium−140	Neodymium−147
Beryllium−7	Neptunium−239
Bismuth−212	Niobium−94
Bismuth−214	Niobium−95
Cerium−139	Potassium−40 *
Cerium−141	Promethium−144
Cerium−144	Promethium−146
Cesium−134	Radium−228
Cesium−136	Ruthenium−106
Cesium−137 *	Silver−110m
Chromium−51	Sodium−22
Cobalt−56	Thallium−208
Cobalt−57	Thorium−230
Cobalt−58	Thorium−234
Cobalt−60 *	Tin−113
Europium−152	Uranium−235 *
Europium−154	Uranium−238 *
Europium−155	Yttrium−88
Iridium−192	Zinc−65
Iron−59	Zirconium−95

* WVDP-related Radionuclide (per 2012 ASER) that will be assessed for the BUD.
Uranium isotopes will be analyzed by both alpha and gamma spectroscopy.

TABLE 2. SPRINGVILLE DAM SEDIMENT DATA QUALITY OBJECTIVES AND SAMPLING SUMMARY

Project Objective	Target Media	Rationale	Analytical Parameter/Suite	Sample Locations Map	Sediment Sample Locations	Samples per Location	Total Number of Samples
Field Sample Collection Summary							
Contaminant Presence	Sediment	Primary Screening	Gamma Spectroscopy Suite	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Strontium-90	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Total Uranium (elemental)	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Isotopic Plutonium (Pu-238, Pu-239/240)	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Uranium-232, -234, -235, -238	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Gross Alpha	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Gross Betta	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	TAL Metals (23 Elements), Hg, Zn	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Volatile Organic Compounds (VOCs)	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Semi-volatile Organic Compounds (SVOCs)	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Pesticides	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Herbicides	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	PCBs (Aroclors)	Figure 2	11	4	44
Contaminant Presence	Sediment	Primary Screening	Total Organic Carbon (TOC)	Figure 2	11	4	44
Physical Characteristics	Sediment	Primary Screening	Particle Size Analysis - ASTM D422	Figure 2	11	4	44
						Total Primary Samples:	**660**
QA/QC Sample Detail							
Reproducibility	Sediment	Field QA Split Sample (10%)	See Analytes Above (sans Particle Size Analaysis)	N/A	4	1	4
Reproducibility	Sediment	Field Duplicate Sample (5%)	See Analytes Above (sans Particle Size Analaysis)	N/A	2	1	2
Reproducibility	Sediment	MS/MSD Sample (5%)	See Analytes Above (sans Particle Size Analaysis)	N/A	2	2	4
						Total Laboratory QA/QC Samples:	**10**
						Total Laboratory Samples:	**670**

TABLE 3. SPRINGVILLE DAM SEDIMENT SCREENING VAUES FOR BENEFICIAL USE DETERMINATION

Constituent	Primary Screening Source	Secondary Screening Source
Cyanide, Total	6 NYCRR Part 375-6.8(b): Restricted Use Soil Cleanup Objectives Residential Protection (a)	6 NYCRR Part 375-6.8(b): Restricted Use Soil Cleanup Objectives Groundwater Protection (a)
TAL Metals (23 Elements), Hg, Zn		
Individual Polycyclic Aromatic Hydrocarbons (Semi-volatile PAHs)		
Volatile Organic Compounds (VOCs)		
Pesticides		
Total PCBs		
Aluminum	For TAL Metals not listed in 6 NYCRR Part 375, use CP-51, Soil Cleanup Guidance Policy (2010) Residential for Co, Fe, V (b)	For TAL Metals not listed in 6 NYCRR Part 375, use CP-51, Soil Cleanup Guidance Policy (2010) Ecologic for Al, An, Ca, Mo, Th (b)
Antimony		
Calcium		
Cobalt		
Iron		
Molybdenum		
Thallium		
Vanadium		
Magnesium	Nutrient Metals No Comparative Goals Available	Nutrient Metals No Comparative Goals Available
Potassium		
Sodium		

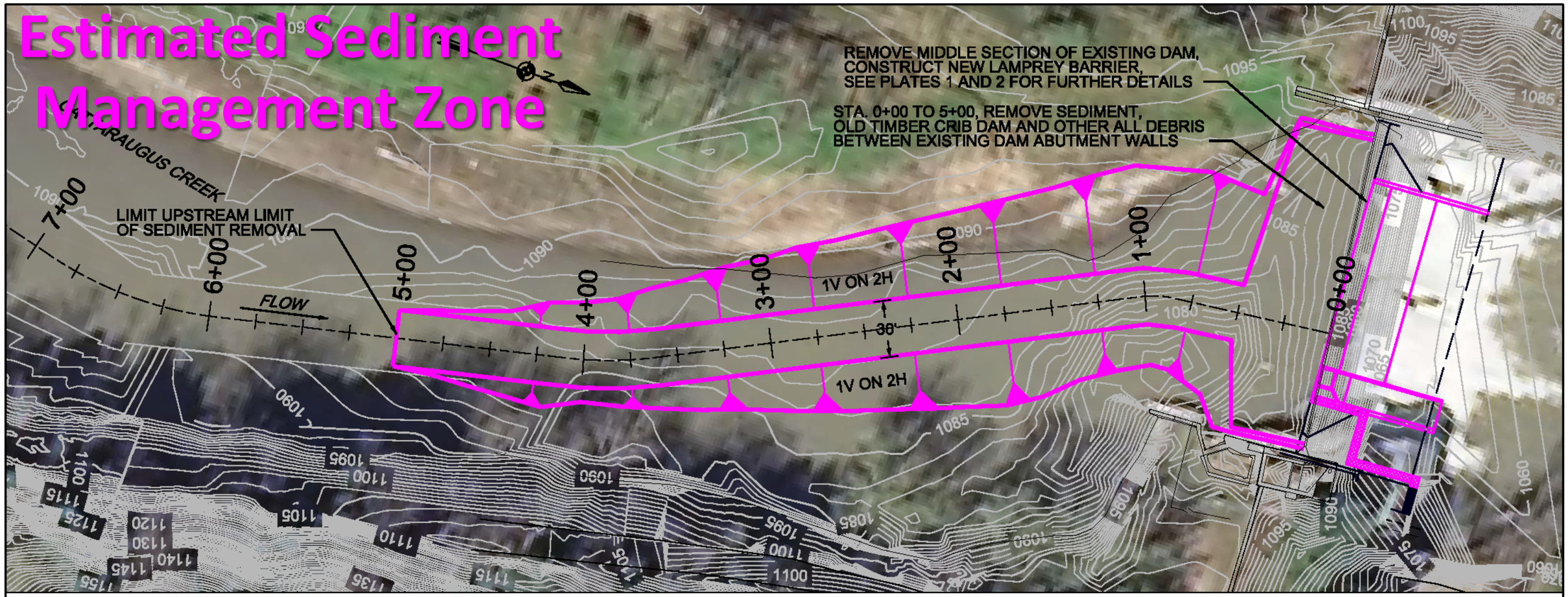
WVDP Radionuclides	Symbol	Primary Screening Range	Units	Primary Screening Source	Secondary Screening Range	Units	Secondary Screening Source
Potassium-40	K-40	13.7±1.5	pCi/g	WVDP ASER 2012 (DOE 2013) Table F-2E, Bigelow Bridge 10-year Average for Cattaraugus Creek Background (Sediment last collected in 2012 on five-year periodicity.)	10.6±1.3	pCi/g	WVDP ASER 2012 (DOE 2013) Table F-2D, 10-year Average for Background Soil at Great Valley Air Monitor (Soil last collected in 2012 on five-year periodicity.)
Cobalt-60	Co-60	0.0002±0.0162	pCi/g		0.0005±0.0261	pCi/g	
Strontium-90	Sr-90	0.0004±0.0497	pCi/g		0.0349±0.0403	pCi/g	
Cesium-137	Cs-137	0.0373±0.0227	pCi/g		0.350±0.058	pCi/g	
Uranium-232	U-232	0±0.0552	pCi/g		-0.0034±0.0273	pCi/g	
Uranium-233/234	U-233/234	0.542±0.119	pCi/g		0.80±0.12	pCi/g	
Uranium-235/236	U-235/236	0.0573±0.0388	pCi/g		0.0371±0.037	pCi/g	
Uranium-238	U-238	0.53±0.114	pCi/g		1.01±0.13	pCi/g	
Total Uranium (elemental)	Total U	1.91±0.04	mg/kg		2.26±0.14	mg/kg	
Plutonium-238	Pu-238	0.0111±0.0186	pCi/g		0.00275±0.00934	pCi/g	
Plutonium-239/240	Pu-239/240	0.0144±0.0144	pCi/g		0.0165±0.0170	pCi/g	
Amercium-241	Am-241	0.017±0.0224	pCi/g		0.0061±0.0106	pCi/g	
Gross Alpha Activity	Gross Alpha	11.6±3.5	pCi/g		25.1±7.0	pCi/g	
Gross Beta Activity	Gross Beta	16.9±2.9	pCi/g		29.3±4.5	pCi/g	

NOTES:

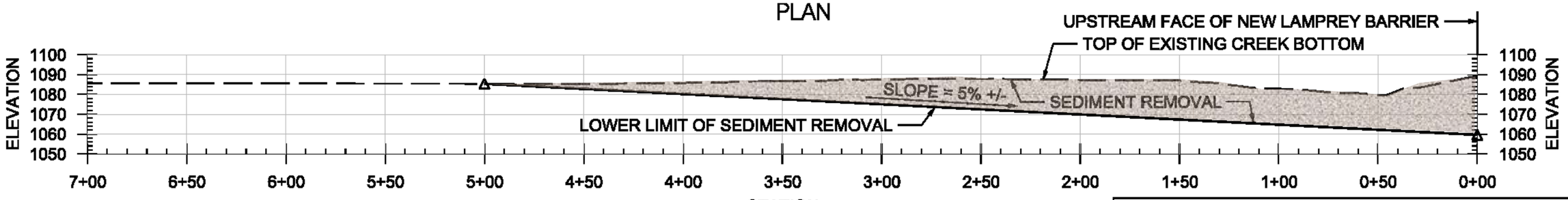
a - Reference at:
https://govt.westlaw.com/nycrr/Document/I4eadfca8cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitio
b - Reference at:
http://www.dec.ny.gov/docs/remediation_hudson_pdf/cpsoil.pdf
DOE 2013 Reference at: http://www.wv.doe.gov/

F I G U R E S

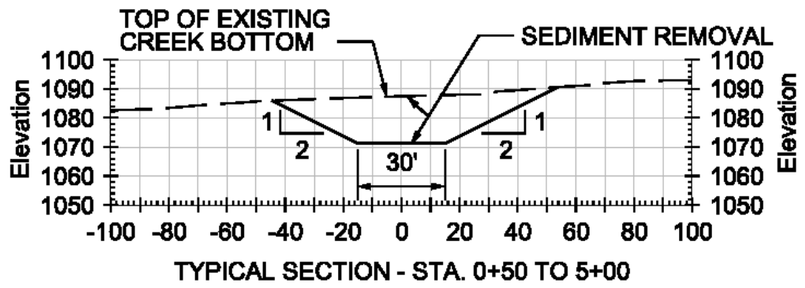
Estimated Sediment Management Zone



PLAN



PROFILE



TYPICAL SECTION - STA. 0+50 TO 5+00

50' 25' 0 50'

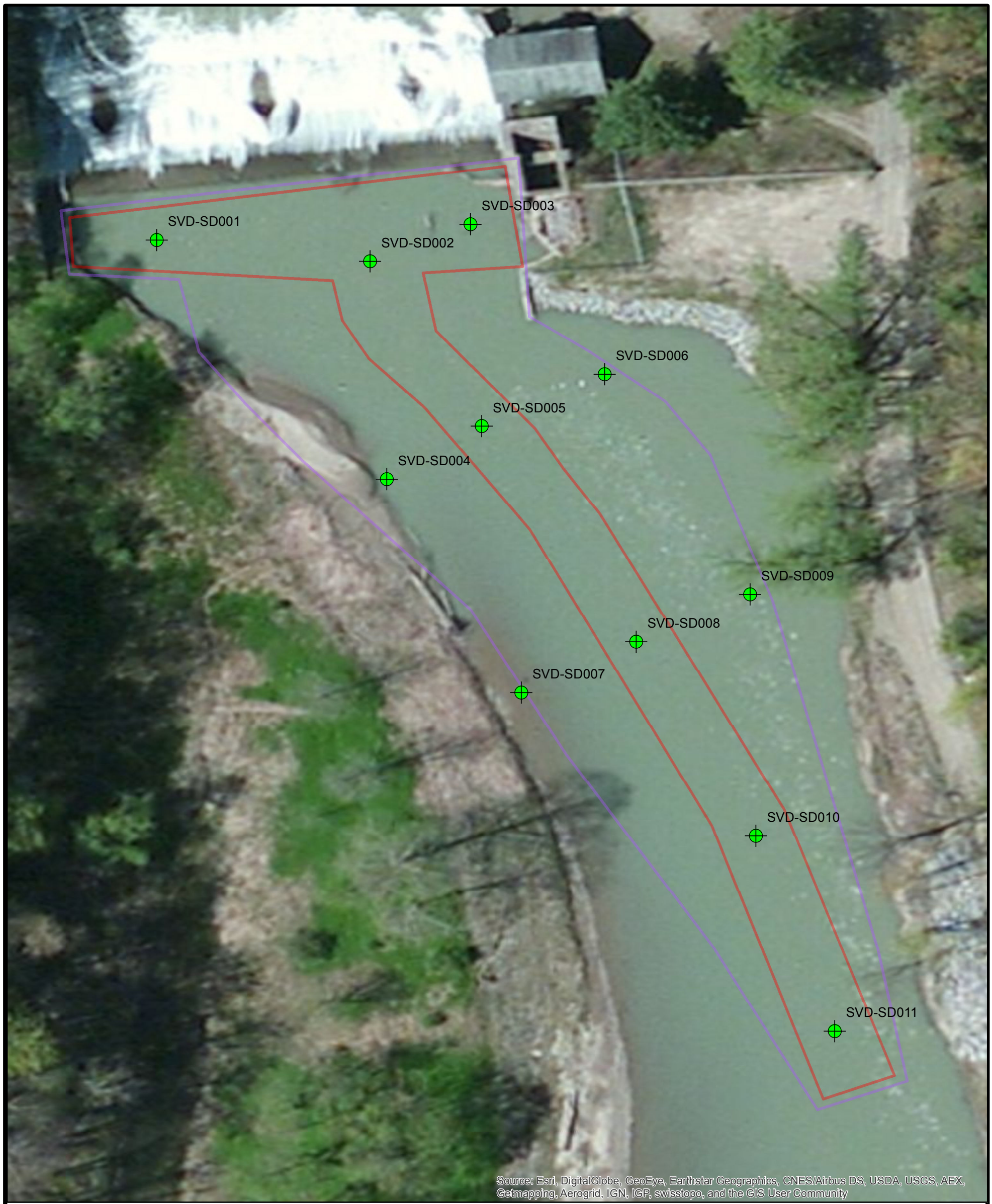
SCALE: 1'' = 50'-0"

PLATE 3

SPRINGVILLE DAM
SPRINGVILLE, NY

ALTERNATIVE NO. 2
DAM BREACHED
WITH NEW LAMPREY BARRIER
SEDIMENT REMOVAL PLAN & PROFILE

Figure 1



Legend

Proposed BUD Sediment Sampling Locations

SVD Design Thalweg

SVD Sediment Management Zone

N
W E
S

0 25 50 75 100 125
Feet

US Army Corps of Engineers
Buffalo District

Proposed BUD Sediment Sampling Locations

Document Name: SVD_2016_BUD_Sediment_Sampling_R0.mxd
Drawn By: h5tdewtf
Date Saved: 17 Jul 2017
Time Saved: 1:40:34 PM

Springville Dam - GLFER

FIGURE 2