Final Feasibility Study Report Addendum for Former Adirondack Steel Site Operable Unit OU-3 Town of Colonie Albany County, New York

Site Number 4-01-039

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Prepared for: NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION 625 Broadway

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ist of Abbreviations and Acronyms

bgs below ground surface

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

cy cubic yards

CP-51 Commissioner Policy No. 51
CWM Chemical Waste Management

DER (New York State) Division of Environmental Remediation

EEEPC Ecology and Environment Engineering, P.C.

EPA United States Environmental Protection Agency

FS Feasibility Study

NYCRR New York Codes, Rules, and Regulations

NYSDEC New York State Department of Environmental Conservation

NYSDOH New York State Department of Health

OSHA Occupational Safety and Health Administration/Act

OU operable unit

PCB polychlorinated biphenyl

ppm parts per million

PRAP Proposed Remedial Action Plan

RCRA Resource Conservation and Recovery Act

SCG standards, criteria, and guidelines

SCO Soil Cleanup Objectives

TAGM Technical and Administrative Guidance Memorandum

TSCA Toxic Substance Control Act

1

Purpose of this OU-3 Feasibility Study Addendum

Ecology and Environment Engineering, P.C. (EEEPC) has prepared this Feasibility Study (FS) Addendum for the Former Adirondack Steel Site (NYSDEC Site 4-01-039) at the request of the Division of Environmental Remediation (DER) in the New York State Department of Environmental Conservation (NYSDEC). This addendum presents updated cost estimates based on a revised method of calculating the extent of excavations under the existing alternatives and proposes a new alternative, Alternative 7, for the excavation and off-site disposal of polychlorinated biphenyl (PCB)-contaminated soils/sediments exceeding unrestricted-use soil cleanup objectives (SCOs).

The Final FS Report for the Former Adirondack Steel Site, Operable Unit OU-3, was submitted to NYSDEC on November 7, 2014 (EEEPC 2014). The FS and FS Addendum were conducted under the State Superfund Standby Contract Work Assignment No. D007617-24. The FS and FS Addendum were developed based on information in the United States Environmental Protection Agency's (EPA) Guidance for conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (EPA 540/G-89/004); NYSDEC's Final Commissioner Policy No. 51 (CP-51), NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) 4030 – Selection of Remedial Actions at Inactive Hazardous Waste Sites (NYSDEC 1990); NYSDEC's DER-10 – Technical Guidance for Site Investigation and Remediation (NYSDEC 2010a); and 6 New York State Codes, Rules, and Regulations (NYCRR) Part 375 - Environmental Remediation Programs.

The project site is located in the Town of Colonie, Albany County, New York, at 191, 225, 227, and 229 Watervliet-Shaker Road at the corner of Lincoln Avenue and Watervliet-Shaker Road (see Figure 1-1). It is the location of an abandoned steel mill called the "Adirondack Steel Casting Co. Inc." The site contains three operable units (OUs): OU-1 (0.4 acres on-site), OU-2 (2.1 acres off-site), and OU-3 (3.8 acres on-site).

Section 2 discusses the determination of the extent of contamination, which is different for each of the four potential soil cleanup objectives (SCOs) considered for the site. Section 2 describes the method used to estimate the extent of soil contamination that was used in the Final FS to screen the remedial technologies deemed

1 Purpose of this OU-3 Feasibility Study Addendum

applicable to the remediation of contaminants present at the site and the development of remedial alternatives to address the contamination. Section 2 also presents a revised methodology used to estimate excavation volumes for alternatives using ex situ technologies.

Section 3 provides an overview of the alternatives presented in the Final FS and a detailed description of the new Alternative 7 that is proposed in this FS Addendum. Revised cost estimates are provided for each proposed alternative. References are provided in Section 4.

No comparative analysis of the proposed remedial alternatives has been prepared for this FS Addendum. The comparative analysis will be included with the rationale and discussion regarding the selection of the remedy in the Proposed Remedial Action Plan (PRAP) that will be completed by NYSDEC.

2

Extent of Contamination

Based on the historical release of PCBs from on-site transformers and a review of the contaminants exceeding the proposed cleanup objectives, it was determined that PCBs are the primary soil contaminants of concern at the site. The SCOs provide the numeric basis for determining the extent of contamination and the volume of soil to be remediated at the Adirondack Steel OU-3 Site.

2.1 Soil Cleanup Objectives

Four SCOs were considered in the alternatives presented in this FS Addendum. Three of the potential SCOs for PCBs are based on the numeric cleanup objectives for the protection of public health given in 6 NYCRR Part 375 (NYSDEC 2006). The fourth soil cleanup objective is based on the guidance values identified for soils in NYSDEC CP-51 (NYSDEC 2010b).

The soil cleanup goals are based on land use criteria. Town of Colonie zoning maps (Town of Colonie 2007) show that the site is zoned as industrial. Discussions with NYSDEC indicate that future land use is uncertain. The alternative and SCO selected in the PRAP will dictate the future limits on the site land use

Potential SCOs include:

- Part 375 Unrestricted-Use SCOs: Remediation of site soils to a maximum concentration of 0.1 parts per million (ppm) PCBs would result in a future land use without imposed restrictions, e.g., environmental easements or other land use controls (6 NYCRR Part 375-6.8a [NYSDEC 2006]).
- Part 375 Restricted-Commercial SCOs: Remediation of site soils to a maximum concentration of 1 ppm PCBs would result in a future land use restricted to the primary purpose of buying, selling, or trading merchandise or services. Commercial use includes passive recreational uses, which are public uses with limited potential for soil contact (6 NYCRR Part 375-6.8b [NYSDEC 2006]).
- **CP-51 SCOs:** Remediation of site soils to a maximum concentration of 1 ppm PCBs in the surface, from 0 to 1 feet below ground surface (bgs) and 10 ppm PCBs in the subsurface (below 1 foot bgs). CP-51 PCB SCOs may be selected where neither the unrestricted SCOs nor the SCOs for ecological receptors are applied in the remedial program. Future site use could be either restricted-residential, restricted-commercial, or restricted-industrial.



■ Part 375 Restricted-Industrial SCOs: Remediation of site soils to a maximum concentration of 25 ppm PCBs would result in a future land use restricted to the primary purpose of manufacturing, production, fabrication or assembly processes, and ancillary services. Industrial uses do not include any recreational component (6 NYCRR Part 375-6.8b [NYSDEC 2006]).

2.2 Determination of Contaminated Soil Volumes

The volume of contaminated soils/sediments at the site was estimated using AutoCAD and property surveys and depth/concentration sample data and was used in the screening of remedial technologies. The volume of soil contaminated with PCB concentrations that exceed the Toxic Substance Control Act (TSCA) limit of 50 ppm, which are considered hazardous under TSCA, was similarly estimated.

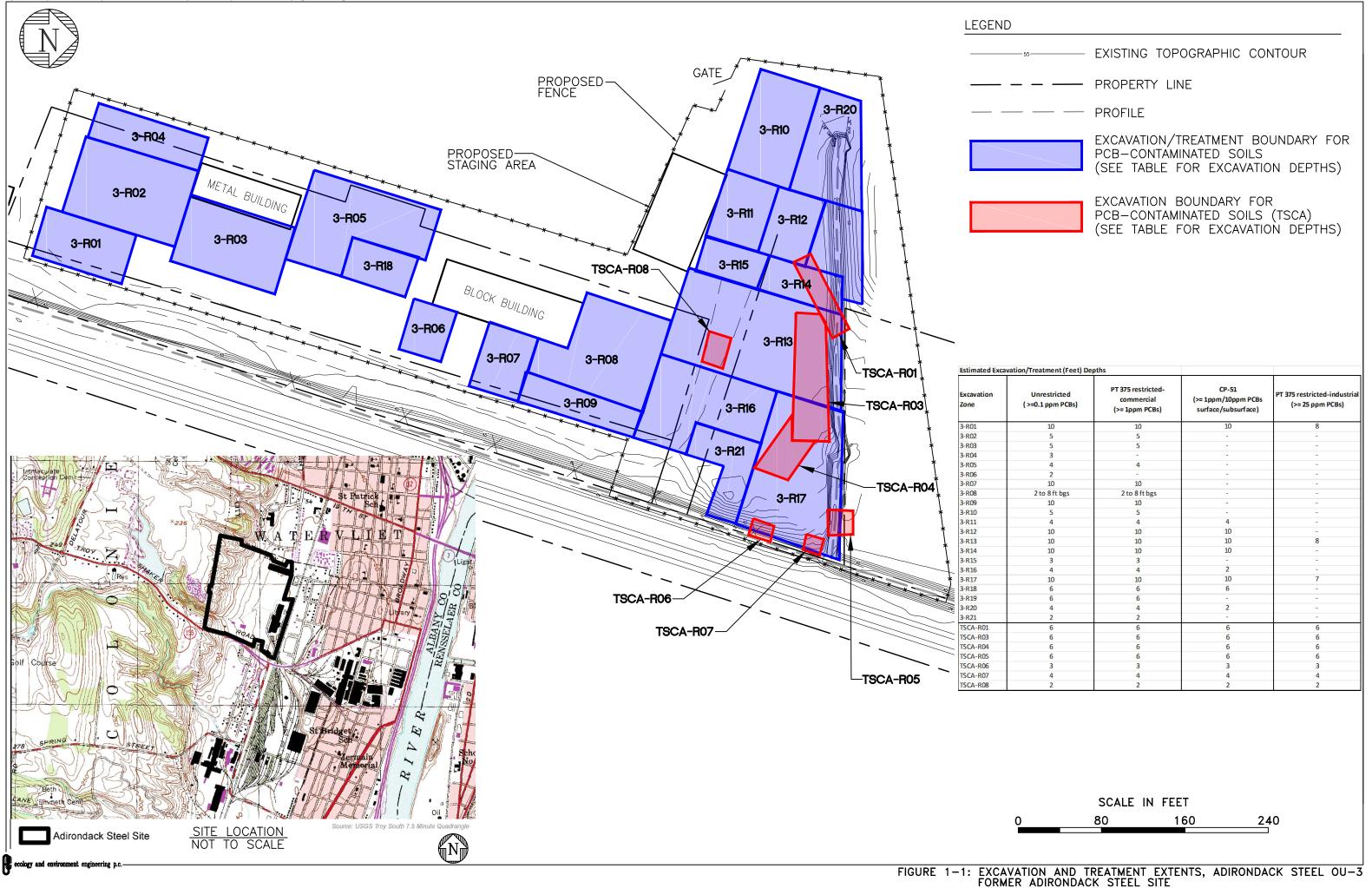
A handful of samples with detected contamination above SCOs were scattered across the site; these samples were too far from the drainageway to be included in the larger extent of contamination and the AutoCAD volume estimates. The volume of contamination at each of these soil boring locations was hand-calculated.

2.3 Determination of Excavation and Treatment Volumes

The volume of contaminated soil excavated and/or treated was calculated by the method described below and was used in the development of remedial cost estimates. Alternatives 3, 4, 6, and 7 require excavation prior to either on-site treatment or off-site disposal, and the excavation volumes have been recalculated in this FS Addendum to more accurately represent construction processes. The contaminated soil area has been divided into discrete excavation zones or boxes. Their size has been increased from the AutoCAD-generated contaminated soil volumes in anticipation of the increase in excavation footprint due to confirmatory samples showing soils exceeding the SCOs. The increase in excavation volumes is intended to generate feasibility study cost estimates that more accurately reflect construction costs rather than based on in situ volumes. The treatment volume for Alternative 5, an in situ remedy, was similarly updated to provide comparable cost estimates for Alternative Selection.

The soil volume estimated to be excavated comprises both TSCA (with PCB concentrations greater than or equal to 50 ppm per the TSCA) and non-TSCA soil.

Excavation volumes used in the cost estimates comprise contaminated drainage-way soils (sediments), surface soil, and subsurface soils, and cutbacks. A cutback of the excavation or other means of safe access and exit must be provided to ensure safe working conditions in the excavation and to meet Occupational Safety and Health Administration Act (OSHA) requirements.



3

Alternatives Summaries and Costs

This section summarizes the remedial alternatives. A detailed description of each alternative can be found in the Final FS, with the exception of the new Alternative 7, which is presented in detail herein. Revised cost estimates are provided for Alternatives 2 through 6, which were estimated according to the methodology discussed in Section 2. Summaries of the costs of each alternative, including the new Alternative 7, are provided in Tables 3-1 through 3-6.

3.1 Alternative 1: No Action

The no action alternative was carried through the FS for comparison purposes, as required by the National Contingency Plan. This alternative would be acceptable only if it is demonstrated that the contamination at the site is below the remedial action objectives or that natural processes will reduce the contamination to acceptable levels. There are no costs associated with this alternative. Current zoning (industrial) indicates that implementation of this alternative would limit the future uses at the site

3.2 Alternative 2: No Further Action with Site Management

This alternative consists of using engineering controls such as fencing and signs to further restrict human contact with site soils/sediments. Institutional controls such as restrictions on subsurface excavation of the project area and monitoring would also be implemented to protect human health and the environment.

The 2014 total present-value cost of this alternative is approximately \$204,000, based on a 30-year period. Table 3-1 presents the respective quantities, unit costs, and subtotal costs for the various work items in Alternative 2. Implementation of this alternative, based on current zoning (industrial), would limit the future uses at the site.

3.3 Alternative 3: Excavation and Off-Site Disposal

This alternative consists of excavation and off-site disposal of contaminated soils/sediments that exceed the site cleanup goals. The excavated material would be stockpiled, sampled, and disposed of accordingly. Excavated soil with PCB concentrations above 50 ppm would be disposed of at hazardous waste facilities. Excavated soil with PCB concentrations below 50 ppm would be disposed of in a permitted NYSDEC-approved non-hazardous/solid waste facility.



The soil volume estimated to be excavated to the proposed Part 375 Restricted-Commercial SCOs in OU-3 comprises approximately 27,700 cy of non-TSCA soil and 1,800 cy of TSCA soil. The soil volume estimated to be excavated to the proposed CP-51 SCOs in OU-3 comprises approximately 15,700 cy of non-TSCA soil and 1,800 cy of TSCA soil.

The 2014 total present-value cost of achieving Part 375 Restricted-Commercial SCOs under Alternative 3 is approximately \$9,343,000. The 2014 total present-value cost of achieving CP-51 SCOs under Alternative 3 is approximately \$6,055,000. Tables 3-2a and 3-2b present the respective quantities, unit costs, and subtotal costs for the various work items in Alternative 3. Implementation of this alternative would limit the future uses at this site

3.4 Alternative 4: Excavation and On-Site Treatment by High Temperature Thermal Desorption

This alternative consists of excavation and thermal treatment of contaminated soils/sediments that exceed the site cleanup goals. An on-site mobile high-temperature thermal desorption system was selected to thermally treat the contaminated soils. This process applies heat to the contaminated material and volatilizes the contaminants (a physical separation process). The resulting gas stream is then collected and treated separately. An air pollution control system would also be included as part of the treatment system to ensure that the air emissions meet regulatory criteria prior to discharge into the atmosphere.

The soil volume estimated to be excavated to the proposed Part 375 Restricted-Commercial SCOs in OU-3 comprises approximately 27,700 cy of non-TSCA soil and 1,800 cy of TSCA soil. The soil volume estimated to be excavated to the proposed CP-51 SCOs in OU-3 comprises approximately 15,700 cy of non-TSCA soil and 1,800 cy of TSCA soil.

The 2014 total present-value cost of achieving Part 375 Restricted-Commercial SCOs under Alternative 4 is approximately \$10,801,000. The 2014 total present-value cost of achieving CP-51 SCOs under Alternative 4 is approximately \$7,210,000. Tables 3-3a and 3-3b present the respective quantities, unit costs, and subtotal costs for the various work items in Alternative 4. Implementation of this alternative would limit the future uses at this site.

3.5 Alternative 5: In Situ Solidification

This alternative consists of in situ treatment and demobilization of contaminated soils/sediments that exceed site cleanup goals. This alternative assumes that portland cement will be mixed with the PCB-contaminated soil to produce a monolithic block that will immobilize the contamination. Prior to treatment, a treatability study would be needed in order to determine how well this system would treat the PCB contamination at OU-3. This alternative is considered for PCB remediation to Part 375 Restricted-Commercial and CP-51 SCOs.



The soil volume estimated to be treated, in situ, to the proposed Part 375 Restricted-Commercial SCOs in OU-3 comprises approximately 27,700 cy of non-TSCA soil and 1,800 cy of TSCA soil. The soil volume estimated to be treated, in situ, to the proposed CP-51 SCOs in OU-3 comprises approximately 15,700 cy of non-TSCA soil and 1,800 cy of TSCA soil.

The 2014 total present-value cost of achieving Part 375 Restricted-Commercial SCOs under Alternative 5 is approximately \$17,127,000. The 2014 total present-value cost of achieving CP-51 SCOs under Alternative 5 is approximately \$10,217,000. Table 3-4 presents the respective quantities, unit costs, and subtotal costs for the various work items in Alternative 5. Implementation of this alternative would limit the future uses at this.

3.6 Alternative 6: Excavation and Off-Site Disposal of PCB-Contaminated Soil/Sediment Exceeding Restricted-Industrial SCOs

This alternative consists of excavation and off-site disposal of contaminated soils/sediments exceeding the Part 375 Restricted-Industrial SCO for PCBs of 25 ppm. The excavated material would be stockpiled, sampled, and disposed of accordingly. Excavated soil with PCB concentrations above 50 ppm would be disposed of at hazardous waste facilities. Excavated soil with PCB concentrations below 50 ppm would be disposed of in a permitted NYSDEC-approved non-hazardous/solid waste facility.

The soil volume estimated to be excavated to the proposed Part 375 Restricted-Industrial SCOs in OU-3 comprises approximately 8,700 cy of non-TSCA soil and 1,800 cy of TSCA soil.

The 2014 total present-value cost of achieving Part 375 Restricted-Industrial SCOs under Alternative 6 is approximately \$4,133,000. Table 3-5 presents the respective quantities, unit costs, and subtotal costs for the various work items in Alternative 6. Implementation of this alternative would limit the future uses at this site to industrial activities in line with current zoning.

3.7 Alternative 7: Excavation and Off-Site Disposal of PCB-Contaminated Soil/Sediment Exceeding Unrestricted-use SCOs

3.7.1 Detailed Description

Adirondack Steel OU-3 is zoned for industrial uses. SCOs in the Final FS were evaluated based on the indication by NYSDEC that the future use of the site may change from being zoned for industrial uses. Alternative 7 involves the excavation and off-site disposal of PCB-contaminated soil and sediment based on SCOs reflecting unrestricted future use of the site. The unrestricted-use SCO for PCBs is 0.1 ppm. This alternative would be implemented as described in the Final FS for Alternative 3: Excavation and Off-Site Disposal.



This alternative involves excavating and disposing off-site contaminated soils and sediments that exceed the 0.1 ppm site cleanup goal. The contaminated materials would be excavated, stockpiled, characterized, and properly disposed of at an off-site NYSDEC-permitted facility. TSCA soils, or soil containing PCBs at concentrations greater than or equal to 50 ppm, are considered hazardous, while those with PCB concentrations less than 50 ppm are considered non-hazardous. Figure 1-1 shows the extent of TSCA and non-TSCA excavations in OU-3.

Before excavation, an assessment of the project area shall be completed to identify existing habitat and wildlife that may be protected by the potentially applicable standards, criteria, and guidelines (SCGs) described in Section 2 of the Final FS. During excavation, care shall be taken through the installation of silt fences to protect existing habitat and wildlife within the project area.

The contaminated materials would be excavated using conventional construction equipment, primarily a hydraulic excavator. During excavation, PCB field-screening tests would be performed in accordance with 40 CFR 761.61. NYSDEC's construction oversight observer would use the results of the field screening tests to verify contamination levels. A sampling grid over the excavation area would be developed for the construction oversight observer's approval. The maximum depth of excavation in the excavation areas would be at least 10 feet bgs, based on contaminated sample depths; however, excavation would continue at the direction of NYSDEC until confirmatory sampling reveals that the SCGs have been met. Sheet pile reinforcement is anticipated to be required in excavations adjacent to existing buildings and along the railroad right of way.

While directly loading transport trucks is preferred, temporary facilities could be needed for on-site storage of contaminated material after excavation, depending on the contractor's methods of operation. Excavated materials that are contaminated and not directly loaded on to trucks would be stockpiled on plastic liners or containment pads on-site for characterization, in accordance with disposal facility requirements. The contractor would be responsible for characterization sampling, which would be conducted at a New York State Department of Health (NYSDOH)-certified laboratory.

After the results of the characterization sampling are received, the soil would be cleared for disposal by the NYSDEC construction oversight observer. Trucks would be manifested then weighed with an empty load. The soil would be loaded onto the trucks then weighed again to determine the approximate loaded weight of the vehicle. The trucks would then transport the soil to the appropriate disposal facility. The final tipping weight of each truck would be recorded on the Hazardous Waste Manifest or Non-Hazardous Waste Manifest and retained for EPA and NYSDEC reporting purposes.



TSCA materials would be disposed of at a NYSDEC-approved Resource Conservation and Recovery Act (RCRA) Subtitle C landfill. According to the United States Army Corps of Engineers Hazardous, Toxic, and Radioactive Waste Center of Expertise Information, five hazardous waste landfill facilities operating in the United States are permitted to accept these soils. Of those five, only one of the facilities is located east of the Mississippi River, Chemical Waste Management (CWM) in Model City, New York. The CWM facility in Model City, Niagara County, New York, is the closest facility to the site and, therefore, the likely destination for the TSCA-level PCB-contaminated soils from the site.

A number of disposal locations are available for non-hazardous materials. For example, the Clinton County, New York landfill, operated by Casella, is relatively close to the site and accepts soil/sediments and stone with PCBs less than 50 ppm. Unit costs from the CWM facility at Model City, have been used for costing purposes, with the understanding that landfills closer to the site may be identified at the design stage.

Based on the groundwater elevations data collected during the remedial investigation (EEEPC 2008), dewatering may be necessary in portions of the site. Means and methods of dewatering would be determined by the contractor's approach to the site work. EEEPC assumed a temporary water treatment system would be established on-site and that the contractor would employ a series of earth dikes and bypass pumps to move water in ditch areas not under excavation around established exclusion zones. Treated water would be discharged, as appropriate, offsite.

Following excavation and removal of designated materials from the site, a uniform invert elevation at the ditch centerline would be restored to promote positive drainage. Imported clean fill would be placed and compacted in the excavation areas to restore grades and to reconstruct the ditch. Six inches of topsoil would be placed and graded across the entire excavation area. After backfill and ditch reconstruction operations are complete, the surrounding site would be restored using hydroseeding.

The soil volume estimated to be excavated to the proposed Part 375 Unrestricted SCOs in OU-3 comprises approximately 28,200 cy of non-TSCA soil and 1,800 cy of TSCA soil. These volumes are composed of contaminated drainageway soils (sediments), surface soil, and subsurface soils, and cutbacks.

3.7.2 Detailed Evaluation of Criteria

Overall Protection of Human Health and the Environment

This alternative is protective of human health and the environment because contaminated soils would be removed from the site and properly disposed of in a NYSDEC-permitted facility. Because the contaminants would be removed from the site, exposure risks associated with soil contamination would be reduced to levels acceptable for an unrestricted use.



Compliance with SCGs

This alternative complies with unrestricted-use SCGs since contaminated soils would be removed from OU-3 and properly disposed of in an environmentally acceptable facility. Off-site disposal would comply with all applicable land disposal restrictions and analytical requirements. Action- and location-specific SCGs, including noise limitations, wetlands permits (as required), and OSHA regulations, would be complied with during implementation of this alternative or included and enforced with institutional controls.

Short-Term Impacts and Effectiveness

Several short-term impacts on the community and workers may arise during excavation of contaminated soil at the site, including dust, noise, and potential spills during handling and transportation of contaminants. To minimize short-term impacts, site access would be restricted during construction and remediation activities. Health and safety measures, including air monitoring, using appropriate personal protective equipment, and using decontaminating equipment when leaving the site, would be in place to protect the workers and surrounding residents and community. Action levels would be set prior to any intrusive activities, and an appropriate corrective action would be implemented if these action levels are exceeded.

A licensed hauler would provide off-site transportation of contaminated soil to the disposal facility. While there is a risk of spills due to accidents, this risk would be limited by using closed and lined containers for transport.

Because this alternative involves removal of the contaminated soil from the site and replacement with clean fill, site remedial action objectives would be achieved at the completion of this work. The time to complete this alternative is estimated to be approximately six months.

Long-Term Effectiveness and Permanence

Removal and off-site disposal is considered to be an adequate and effective remedy in the long-term since the remaining soil would meet site cleanup criteria. Therefore, human health and environmental risks would be reduced to levels appropriate for an unrestricted use of the site.

Reduction of Toxicity, Mobility, and Volume through Treatment

This alternative does not reduce the toxicity, mobility, or volume of contaminated soil through treatment. However, excavation and off-site disposal of contaminated soils would mitigate concerns associated with toxicity and mobility of the contaminants at the site.

Implementability

This alternative is readily implemented using standard construction means and methods. Contaminated soil would be excavated, tested, and disposed of at a non-

3 Alternatives Summaries and Costs

hazardous waste facility. Several facilities that can accept the contaminated soil from the site have been identified. No capacity or availability problems have been identified. Finally, no delay in obtaining the necessary approvals from the state and local agencies for implementation of this alternative is expected.

Cost

The 2014 total present-value cost of achieving Part 375 Unrestricted-Use SCOs under Alternative 7 is approximately \$9,531,000. Table 3-6 presents the respective quantities, unit costs, and subtotal costs for the various work items in Alternative 7. A summary of the costs of each alternative is presented in Table 3-7.

Land Use

The site comprises just one property parcel that is owned by Albany County. The Town of Colonie zoning map (Town of Colonie 2007) shows that the site is zoned as industrial. Implementation of Alternative 7 would not limit the future use of this site.

Table 3-1 Cost Estimate for Alternative 2 - Institutional Controls with Long-Term Site Management

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Institutional Controls	Deed Restrictions Commercial/Industrial	Each	1	\$6,000	\$6,000
Subtotal					\$6,000
Physical Barriers/Warnings					
Signs	Reflectorized 24" x 24" sign mounted to fence	Each	4	\$196.37	\$785
Subtotal					\$785
			Capital C	ost Subtotal:	\$6,785
	Adjusted Capital Cost Subtotal for A	lbany, New Yo	ork Location Fa	actor (0.982):	\$6,663
	10% Legal, administrative, eng	ineering fees,	construction r	nanagement:	\$666
			15% C	ontingencies:	\$1,099
			Total C	Capital Cost:	\$9,000
Annual Costs					
Sediment/Soil Sampling (Labor)	2-people @ \$100/hr; 8 hr/day; total of 10 samples	Day	1	\$1,936.00	\$1,936
Parameter Analysis	Includes TCL PCBs	Each	10	\$100.00	\$1,000
Data Evaluation and Reporting		HR	32	\$100.00	\$3,200
Subtotal					\$6,136
				cost Subtotal:	\$6,136
	Adjusted Capital Cost Subtotal for A				\$6,026
	10%	6 Legal, admir	nistrative, engi		\$603
				ontingencies:	\$994
				l Cost Total:	\$7,622
	30)-Year Preser	nt Worth of Ar	nual Costs:	\$118,000
5-Year Costs (Periodic Costs)					
10% of Existing Fence along OU-3 Boundary Replaced	Chain link industrial, 6' high, 6 gauge wire with 3	LF	166	\$30.21	\$5,000
	strands barb wire				
Institutional Controls	Maintain/update documentation	Each	1	\$7,500.00	\$7,500
5-year CERCLA reviews		Hr	80	\$120.00	\$9,600
Subtotal					\$22,100
				ost Subtotal:	\$22,100
	Adjusted Annual Cost Subtotal for A				\$21,702
10% Legal, administrative, engineering fees:					\$2,170
				ontingencies:	\$3,581
				-Year Total:	\$27,453
	3	0-Year Prese	nt Worth of 5	Year Costs:	\$77,000
		2014 7	otal Present	Worth Cost:	\$204,000

Key: HR = hour LF = linear foot LS = lump sum

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
<u>Capital Costs</u>					
Construction Management (2.5% of total capital cost)	Includes submittals, reporting, meetings over 180 day duration	LS	1	\$182,764.43	\$182,764
Subtotal					\$182,764
Site Preparation					
Mobilization		LS	1	\$10,000.00	\$10,000
Surveying Crew	1-person crew @ \$100/hr, 8hr/day; assume 30% of project duration	Day	54	\$800.00	\$43,200
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	2,600	\$7.05	\$18,328
Site Services	NYSDEC Field Office 180 Day Duration	DAY	180	\$500.00	\$90,000
Construct Decontamination Pad & Containment	For Haz trucks exiting exclusion zone	EA	1	\$7,000.00	\$7,000
Clearing and Grubbing	Estimated surface area of excavations per Figure 1-1. Cutbacks assumed to add 5%. Includes inlet area to be	SY	13,995	\$1.84	\$25,791
	restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.		,	7 - 10 - 1	7-2,12
Subtotal					\$214,320
Health and Safety				<u> </u>	
Health and Safety	HSO, CAMP and Security Reporting	DAY	180	\$958.33	\$172,500
Subtotal					\$172,500
Excavation				•	
Sheet Piling, Drive, Extract & Salvage	15' Deep excavation (max)	ton	248	\$2,039.27	\$504,721
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	ВСҮ	1,873	\$15.00	\$28,098
PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276	\$78.04	\$177,606
Excavation - Non-TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	ВСҮ	29,005	\$15.00	\$435,069
PCB Contaminated Soil Disposal	Non-TSCA soils-bulk disposal	TON	35,241	\$34.69	\$1,222,491
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	35,241	\$78.04	\$2,750,044
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr/day	Day	119	\$3,193.35	\$381,402
PCB Wastewater Treatment during Remediation of Drainageway Sediments	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050 Fill and 3" Portable Trash Pump 300 GPM	LS	1	\$27,653.00	\$27,653
Waste Characterization Sampling	As req'd to satisfy off-site Landfill Requirements	Each	34	\$208.33	\$7,083
Confirmation/Documentation Sampling - EPA SW-846, Method SW-8082	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with over 300 liner feet of perimeter.	Each	607	\$208.33	\$126,458

Item Description	ccavation and Off-Site Disposal, Alternative 3, Part 375 Restricted-Commercial SCOs Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					\$5,923,01
Reconstruction					
Backfill	common earth, 3/4 CY bucket, front-end loader, includes borrow, loading, and spreading and materials. Includes excavations and inlet areas.	BCY	30,878	\$18.73	\$578,376
Backfill, transportation to site only	Assumes 10 mile haul	LCY	34,583	\$5.99	\$207,220
Compaction	Vibrating roller, 6" lifts, 2 passes	ECY	30,878	\$1.06	\$32,650
Erosion and Soil Control Blankets	Biodegradable to temporarily stabilize stream channel/invert until natural growth is established. Only provided in inlet area.	SY	1,667	\$6.60	\$10,994
Rough Grading of Drainageway Invert	Assumes as 20 foot by 50 foot invert area	EA	1	\$1,325.00	\$1,325
Medium Rip Rap	To armor invert near intersection with OU-2; Includes machine placement for slope protection.	BCY	37	\$65.96	\$2,443
Medium Rip Rap, transportation to site only	Assumes a 10 mile haul	LCY	37	\$5.99	\$222
Subtotal					
Site Restoration					
Topsoil	0.5 ft thick over entire excavation area, swell at 12%	LCY	2,307	\$39.88	\$92,009
Hydroseeding	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer for total topsoil area. Includes excavations and inlet areas.	SY	13,995	\$1.49	\$20,859
Plantings	Sandbar Willow/Red Osier Dogwood/Northern Bayberry/Catskill Sand Cherry - 20% of hydroseeded area	SY	2,799	\$15.95	\$44,649
Demobilization		LS	1	\$10,000.00	\$10,000
Subtotal					\$167,516
				tal Cost Subtotal:	\$7,493,341
	Adjusted Capital Cost Subtotal f			, ,	\$7,358,461
		10% Legal,		engineering fees:	\$735,846
				% Contingencies:	\$1,214,146
Annual Costs			Tot	tal Capital Cost:	\$9,309,000
Not Applicable				\$0.00	\$0
Subtotal				ψσ.σσ	\$0
			Annu	al Cost Subtotal:	\$0
Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):					\$0 \$0
10% Legal, administrative, engineering fees:					\$C \$C
				% Contingencies:	\$0
				nual Cost Total:	\$0
		P	resent Worth	of Annual Costs	\$0

Item Description	Comment	Unit	Quantity	Unit Cost	Cost	
5-Year Costs (Periodic Costs)			-			
5-year CERCLA reviews		Hr	80	\$120.00	\$9,600	
Subtotal					\$9,600 \$9,600	
5-Year Cost Subtotal:						
Adjusted Annual Cost Subtotal for Albany, New York Location Factor (0.982):						
		10% Legal,		engineering fees:	\$943	
			15	% Contingencies:	\$1,555	
				5-Year Total:	\$11,925	
30-Year Present Worth of 5-Year Costs:						
		2	014 Total Pres	ent Worth Cost:	\$9,343,000	

Key:

ALTA = American Land Title Association

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

LCY = loose cubic yards

LF = linear foot

LS = lump sum

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

WWTP = waste water treatment plant

Table 3-2a Revised Cost Estimate for Excavation and Off-Site Disposal, Alternative 3, Part 375 Restricted-Commercial SCOs

Item Description Comme	ent Unit Quantity Unit Cost Cost
Notes: Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)	Index 2014 Markup
instorical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)	1
	2007 84 120%
	2006 80 125% 2002 64 157%
	2002 04 137%
ssumptions:	
Excavation volumes	
a. Total estimated non-TSCA contaminated soil volume =	27,623 BCY, based on N\SDEC shapefiles provided to EEEPC
b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) =	1,784 December 2014
c. Total estimated cut-back soil volumes=	1,470 BCY
d. Total excavated soil volume =	30,878 BCY
Cut-backs were estimated at 5% of total soil volume, because cut-backs would overlap with excavation zones. Actual cut-backs would be ex Total excavation area =	cavated per OSHA guidelines.
a. Non-TSCA excavation area =	111,240 SF, as obtained from EEEPC CAD department December 2014
b. Total estimated TSCA excavation area =	8,717 SF, as obtained from EEEPC CAD department December 2014
c. Total estimated cut-back soil area =	5,998 SF
d. Total excavated soil area =	125,955 SF
Based on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet silty sand and gravel, from Hough, Basic Soils Engineering Soils (1998) and typical properies soil (1998) and typical properies (1998) a	
In-situ soil swell factor assumed =	7%
Number of characterization samples for landfill =	34
The Chemical Waste Management Facility (landfill) in Model City, Niagara County, New York requires PCB samples to be collected every	1,000 CY.
Number of confirmatory samples =	607
Approximate perimeters of all non-TSCA excavation zones =	6,046.00 FT
Approximate perimeters of all TSCA excavation zones =	1,034.50 FT
Number of excavation zones =	26
Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 sample for every 900 SF of bottom area.	Page 156 of 226: 1 surface sidewall and 1 subsurface sidewall sample for every 30 linear feet of perimeter and 1 bottom
Maximum excavation depth =	10 ft BGS
Assumed production rate of excavation =	130 BCY/hr
•	75% assumed effective production rate
	98 BCY/hr, effective production rate
	780 BCY/day, effective production rate
Assuming effective production rate, time to excavate soil =	40 days, or 2.0 months
For loose soil assume sandy, dry soil with swell factor =	12%
(Means Estimating Handbook. United States of America: Means Southern Construction Information Network, 1990).	12/4
Backfill volume for site restoration =	30,878 BCY, or
. Buckini Volume for site restolution —	34,583 LCY
2. Topsoil density assumed to be =	1.2 Tons/LCY
Topsoil volume for site restoration (0.5ft thick) =	2,060 BCY, or
. Topooli voidine foi one feotoridion (o.on unek) –	2,307 LCY
. Assumed production rate of backfill =	550 BCY/day
. Assumed production rate of backfill = 550 LCY/day for backfill per RSMeans Site Work & Landscape Cost Data 2013 31.23.23.15.4050 (Crew B-10R) includes 1 equp. Operation of the control	•
330 LC 1/day 101 backini per Kolvicans one work & Landscape Cost Data 2015 51.25.25.15.4030 (Clew b-10k) includes 1 equp. Opera	
	75% assumed effective production rate
A sourcing officially and dustion note time to healfill soil —	413 BCY/day, effective production rate
5. Assuming effective production rate, time to backfill soil =	80 days, or 3.0 months

Item Description	Comment	Unit	Quantity	Unit Cost	Cost				
16. Assumed production rate of compaction =		2,600 ECY/day							
2600 ECY/day for compaction per RSMeans Site Work & Landscape Cost Data, 32nd Edition, 31.23.23.23.6	200								
		75% assumed effective production rate							
		1,950 BCY/day, eff	ective production	rate					
17. Assuming effective production rate, time to compact soil =		19 days, or	1.0 n	nonths					
18. Assumedd area of inlet restoration		15,000 SF							
length =		300 ft							
width =		50 ft							
19. Assumed volume of rip-rap									
length =		50 ft							
width =		20 ft							
area =		1,000 SF							
Assumed height of rip-rap =		1.0 ft							
Volume =		37 LCY							
20. Assumed duration of inlet restoration =		15 days, or	1.0 n	nonths					
21. Mob/demob assumed to be =		20 days, or	1.0 n	nonths					
22. Assumed length of perimeter fence =		2,600 LF, as obtain	ed from EEEPC (CAD department Dece	mber 2014				
23. Assumed total duration of site work =		180 days, or	6.0 n	nonths					
24. Present value of costs assumes 5% annual interest rate.									
25. Local sales tax for soil disposal		6% Per WasteMa	nagement quote f	rom September 3, 201	.3				
26. Soil transport fuel surcharge		40% Per WasteMa	nagement quote f	rom September 3, 201	.3				
27. New York sales tax for disposal services		8% Per WasteMa	nagement quote f	rom September 3, 201	.3				
28. Sheetpiling									
Maximum excavation depth (basis for sheetwall selection) =		15 ft BGS							
Length of sheet piling anticipated =		1,500 ft							
Area of sheet piling =		22,500 SF							
Weight of sheet piling =		22 psf							
Total Weight Needed =		248 Ton							

29. Assumes grubbed material will be included in non-TSCA soil disposal, which will have a negligible impact on disposal costs.

Item Description	tion and Off-Site Disposal, Alternative 3, CP-51 SCOs Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs		Oille	quantity	31111 3031	0000
	Includes submittals, reporting, meetings over 122 day duration	LS	1	\$118,205.95	\$118,206
Subtotal					\$440.00G
Site Preparation					\$118,206
Mobilization		LS	1	\$10,000.00	\$10,000
Surveying Crew	1-person crew @ \$100/hr, 8hr/day; assume 30% of project duration	Day	37	\$10,000.00	\$29,600
		LS	1	\$20,000.00	
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	2,600	\$7.05	\$18,328
Site Services	NYSDEC Field Office 122 Day Duration	DAY	122	\$500.00	\$61,068
Construct Decontamination Pad & Containment	For Haz trucks exiting exclusion zone	EA	1	\$7,000.00	\$7,000
Clearing and Grubbing	Estimated surface area of excavations per Figure 1-1. Cutbacks assumed to add 5%. Includes inlet area to be restored	SY	7,583	\$1.84	\$13,974
	where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.				,
Subtotal					\$159,970
Health and Safety					
Health and Safety	HSO, CAMP and Security Reporting	DAY	122	\$958.33	\$117,047
Subtotal					\$117,047
Excavation					
Sheet Piling, Drive, Extract & Salvage	15' Deep excavation (max)	ton	248	\$2,039.27	\$504,721
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	BCY	1,873	\$15.00	\$28,098
PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276	\$78.04	\$177,606
Excavation - Non-TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	BCY	16,437	\$15.00	\$246,559
PCB Contaminated Soil Disposal	Non-TSCA soils-bulk disposal	TON	19,971	\$34.69	\$692,800
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	19,971	\$78.04	\$1,558,483
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr/day	Day	76	\$3,193.35	\$242,759
PCB Wastewater Treatment during Remediation of Drainageway Sediments	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050 Fill and 3" Portable Trash Pump 300 GPM	LS	1	\$27,653.00	\$27,653
Waste Characterization Sampling	As req'd to satisfy off-site Landfill Requirements	Each	20	\$208.33	\$4,167
Confirmation/Documentation Sampling - EPA SW-846, Method SW-8082	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with over 300 liner feet of perimeter.	Each	546	\$208.33	\$113,750

Item Description	avation and Off-Site Disposal, Alternative 3, CP-51 SCOs Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					\$3,858,981
Reconstruction					
Backfill	common earth, 3/4 CY bucket, front-end loader, includes borrow, loading, and spreading and materials. Includes excavations and inlet areas.	BCY	18,310	\$18.73	\$342,975
Backfill, transportation to site only	Assumes 10 mile haul	LCY	20,508	\$5.99	\$122,881
Compaction	Vibrating roller, 6" lifts, 2 passes	ECY	18,310	\$1.06	\$19,362
Erosion and Soil Control Blankets	Biodegradable to temporarily stabilize stream channel/invert until natural growth is established. Only provided in inlet area.	SY	1,667	\$6.60	\$10,994
Rough Grading of Drainageway Invert	Assumes as 20 foot by 50 foot invert area	EA	1	\$1,325.00	\$1,325
Medium Rip Rap	To armor invert near intersection with OU-2; Includes machine placement for slope protection.	BCY	37	\$65.96	\$2,443
Medium Rip Rap, transportation to site only	Assumes a 10 mile haul	LCY	37	\$5.99	\$222
Subtotal					
Site Restoration					
Topsoil	0.5 ft thick over entire excavation area, swell at 12%	LCY	1,167	\$39.88	\$46,547
Hydroseeding	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer for total topsoil area. Includes excavations and inlet areas.	SY	7,583	\$1.49	\$11,301
Plantings	Sandbar Willow/Red Osier Dogwood/Northern Bayberry/Catskill Sand Cherry - 20% of hydroseeded area	SY	1,517	\$15.95	\$24,191
Demobilization		LS	1	\$10,000.00	\$10,000
Subtotal				, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	\$92,039
				ital Cost Subtotal:	\$4,846,444
	Adjusted Capital Cost Subtotal fo				\$4,759,208
		10% Legal,		engineering fees:	\$475,921
				% Contingencies:	\$785,269
Annual Costs			10	tal Capital Cost:	\$6,021,000
Annual Costs Not Applicable				\$0.00	\$0
Subtotal				ψ0.00	\$0 \$0
Annual Cost Subtotal:					
Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):					
10% Legal, administrative, engineering fees:					
			15	% Contingencies:	\$0
				nual Cost Total:	\$0 \$0 \$0
		F	Present Worth	of Annual Costs	\$0

Item Description	Comment	Unit	Quantity	Unit Cost	Cost	
5-Year Costs (Periodic Costs)						
5-year CERCLA reviews		Hr	80	\$120.00	\$9,600	
Subtotal					\$9,600 \$9,600	
5-Year Cost Subtotal:						
	Adjusted Annual Cost Subtotal for				\$9,427	
		10% Legal,	administrative, e	engineering fees:	\$943	
			159	% Contingencies:	\$1,555	
				5-Year Total:	\$11,925	
		30-Year P	resent Worth	of 5-Year Costs:	\$34,000	
		2	014 Total Pres	ent Worth Cost:	\$6,055,000	

Key:

ALTA = American Land Title Association

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

LCY = loose cubic yards

LF = linear foot

 $LS = lump \ sum$

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

WWTP = waste water treatment plant

Item Description	Comment	ι	Jnit Q	uantity	Unit Cost	Cost
Notes: Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Inde	201	4 Markup		
Historical Cost Index (as obtained from RSWeans Facilities Construction Cost Data 2014 29th Ed.)		1/1/2014	100	-		
		2013	99	none 101%		
		2013	96	101%		
		2012	91	110%		
		2007	84	120%		
		2006	80	125%		
		2002	64	157%		
Assumptions:						
1. Excavation volumes						
a. Total estimated non-TSCA contaminated soil volume =			15,655 BCY	, based on N	NSDEC shapefiles p	rovided to EEEPC
b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) =			1,784 Dece	ember 2014		
c. Total estimated cut-back soil volumes=			872 BCY	7		
d. Total excavated soil volume =			18,310 BCY	7		
Cut-backs were estimated at 5% of total soil volume, because cut-backs would overlap with excavation zone	es. Actual cut-backs would be excavated per OSHA guidelines.					
2. Total excavation area =						
a. Non-TSCA excavation area =		56,276 SF, a	s obtained fro	om EEEPC C	CAD department Dec	ember 2014
b. Total estimated TSCA excavation area =		8,717 SF, a	s obtained fro	om EEEPC C	CAD department Dec	ember 2014
c. Total estimated cut-back soil area =		3,250 SF				
d. Total excavated soil area =		68,243 SF				
3. Based on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet silty sand and gravel	, from Hough, Basic Soils Engineering.1957), in-situ bulk density of site soils =		90.0 lbs/c	ef		
4. In-situ soil swell factor assumed =		7%				
5. Number of characterization samples for landfill =		20				
The Chemical Waste Management Facility (landfill) in Model City, Niagara County, New York requires PC	CB samples to be collected every 1,000 CY.					
6. Number of confirmatory samples =		546				
Approximate perimeters of all non-TSCA excavation zones =		6,046.00 FT				
Approximate perimeters of all TSCA excavation zones =		1,034.50 FT				
Number of excavation zones =		16				
Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation and for every 900 SF of bottom area.	Remediation May 2010 DER-10 Page 156 of 226: 1 surface sidewall and 1 subsurface side	ewall sample for every 3	0 linear feet o	f perimeter a	nd 1 bottom sample	
7. Maximum excavation depth =		10 ft BC	GS			
8. Assumed production rate of excavation =		130 BCY	/hr			
		75% assur	ned effective	production r	ate	
		98 BCY	/hr, effective	production r	ate	
		780 BCY	/day, effective	e production	rate	
9. Assuming effective production rate, time to excavate soil =		23 days,	, or	1.0 n	nonths	
10. For loose soil assume sandy, dry soil with swell factor =		12%				
(Means Estimating Handbook. United States of America : Means Southern Construction Information Net	work, 1990).					
11. Backfill volume for site restoration =		18,310 BCY	, or			
		20,508 LCY				
12. Topsoil density assumed to be =		1.2 Tons				
13. Topsoil volume for site restoration (0.5ft thick) =		1,042 BCY				
		1,167 LCY				
14. Assumed production rate of backfill =		550 BCY	/day			
550 LCY/day for backfill per RSMeans Site Work & Landscape Cost Data 2013 31.23.23.15.4050 (Crew	B-10R) includes 1 equp. Operator, 0.5 labor, and 1 front end loader, 1 CY bucket					
			ned effective			
			/day, effective			
15. Assuming effective production rate, time to backfill soil =		53 days,	, or	2.0 n	nonths	

29. Assumes grubbed material will be included in non-TSCA soil disposal, which will have a negligible impact on disposal costs.

Item Description	Comment	Unit	Quantity	Unit Cost	Cos
Assumed production rate of compaction =		2,600 ECY/day			
2600 ECY/day for compaction per RSMeans Site Work & Landscape Cost Data, 32nd Edition, 31.23.	23.23.6200				
		75% assumed effect	ctive production	rate	
		1,950 BCY/day, effe	ective production	n rate	
Assuming effective production rate, time to compact soil =		11 days, or	1.0 1	months	
Assumedd area of inlet restoration		15,000 SF			
ength =		300 ft			
vidth =		50 ft			
Assumed volume of rip-rap					
length =		50 ft			
width =		20 ft			
area =		1,000 SF			
Assumed height of rip-rap =		1.0 ft			
Volume =		37 LCY			
Assumed duration of inlet restoration =		15 days, or	1.0 1	months	
Mob/demob assumed to be =		20 days, or	1.0 1	months	
Assumed length of perimeter fence =		2,600 LF, as obtained	ed from EEEPC	CAD department Dece	mber 2014
Assumed total duration of site work =		122 days, or	4.0 1	months	
Present value of costs assumes 5% annual interest rate.					
Local sales tax for soil disposal		6% Per WasteMa	nagement quote	from September 3, 201	3
Soil transport fuel surcharge		40% Per WasteMa	nagement quote	from September 3, 201	3
New York sales tax for disposal services		8% Per WasteMa	nagement quote	from September 3, 201	3
Sheetpiling					
Maximum excavation depth (basis for sheetwall selection) =		15 ft BGS			
Length of sheet piling anticipated =		1,500 ft			
Area of sheet piling =		22,500 SF			
Weight of sheet piling =		22 psf			

248 Ton

3-27

02:EN-003286-0001-02-B3994

Total Weight Needed =

Table 3-3a Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Construction Management (2.5% of total capital	Includes submittals, reporting, meetings over 230 day duration	LS	1	\$211,257.90	\$211,258
cost)					
Institutional Controls		Each	1	\$5,700.00	\$5,700
Subtotal					\$216,958
Site Preparation					
Mobilization	Excludes HTTD Unit Mobilization (see HTTD (Installation))	LS	1	\$10,000.00	\$10,000
Surveying Crew	1-person crew @ \$100/hr., 8hr/day; assume 30% of project duration	Day	69	\$800.00	\$55,200
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	1,600	\$7.05	\$11,279
Site Services	NYSDEC Field Office 230 Day Duration	DAY	230	\$500.00	\$115,000
Temporary Utility tie in for HTTD unit	80 GPM non-potable and 3 phase/480V/1200 amp (Generator is available through EMSI)	LS	1	\$6,000.00	\$6,000
Construct Decontamination Pad & Containment	For equipment & personnel	Setups	2	\$7,000.00	\$14,000
Clearing and Grubbing	Estimated surface area of excavations per Figure 1-1. Cutbacks assumed to add 5%. Includes inlet area to be restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	SY	13,995	\$1.84	\$25,791
HTTD Unit Proof of Performance Testing	Verify destruction removal efficiency of contaminants and particulate emissions, etc. for permit-equivalency required by RCRA permit. RCRA permit itself, not included.	Each	1	\$100,000.00	\$100,000
Subtotal					\$357,270
Health and Safety					
Health and Safety	HSO, CAMP and Security Reporting	DAY	230	\$958.33	\$220,417
Subtotal					\$220,417
Excavation					
Sheet Piling, Drive, Extract & Salvage	15' Deep excavation (max)	ton	248	\$2,039.27	\$504,721
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	BCY	1,873	\$15.00	\$28,098
Excavation - Non TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation	BCY	29,005	\$15.00	\$435,069
Stockpiling (prior to treatment)	zones. 300 Horsepower Bulldozer w/ 50' haul, includes cut-back volume	BCY	29,005	\$1.71	\$49,655
Stockpiling (after treatment)	300 Horsepower Bulldozer w/ 50' haul, includes cut-back volume	BCY	29,005	\$1.71	\$49,655
Dewatering (arter treatment)	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr./day	Day	131	\$3,193.35	\$417,667
PCB Wastewater Treatment during Remediation of	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050	LS	1	\$27,653.00	\$27,653
Drainageway Sediment	Fill and 3" Portable Trash Pump 300 GPM	Lo		Ψ21,033.00	Ψ21,033
Confirmation/Documentation Sampling - EPA SW-846, Method SW-8082	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with over 300 linear feet of perimeter.	Each	607	\$208.33	\$126,458

Table 3-3a Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs

Item Description	xcavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs Comment	Unit	Quantity	Unit Cost	Cost
Off-Site Disposal of Hazardous Soil (PCBs >			,		
Waste Characterization Sampling	As req'd to satisfy off-site Landfill Requirements for TSCA soil disposal	Each	34	\$208.33	\$7,083
PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276	\$78.04	\$177,606
Subtotal					\$2,086,052
High Temperature Thermal Desorption					
HTTD (Installation)	Includes mob/demob, equipment, labor, permitting (if necessary)	LS	1	\$107,120.81	\$107,121
HTTD (Treatment)	Includes equipment, labor, maintenance, utilities	Ton	35,241	\$142.81	\$5,032,744
Soil Testing (influent)	Includes TCL PCBs (Engineers Allowance for operational days)	Each	112	\$208.33	\$23,307
Soil Testing (effluent)	Includes TCL PCBs (Engineers Allowance for operational days)	Each	28	\$208.33	\$5,827
Subtotal					\$5,168,999
Utilities				•	
Electrical					
Electric Utility Pole	Wooden pole, 40' high	Each	1	\$1,586.10	\$1,586
Wiring to Electric Service	3 - 1/0 Wires	CLF	63	\$468.28	\$29,502
Wiring Connections to treatment facility	200 amp w/ 18 branch breakers, includes main breaker, meter, socket, panel board, ground rod (20' avg runs, #14/2 wiring)	EA	4	\$2,844.91	\$11,380
Switchboard	1200 amp	EA	1	\$7,200.40	\$7,200
Transformer	Dry type transformer, 3 Phase, 500 kVA	EA	1	\$14,904.33	\$14,904
Electrical Connection Fee		LS	1	\$2,900.00	\$2,900
Install Electrical Connections/Testing	0.25 Electrician Foreman, 1 electrician, 2 laborers	Day	5	\$1,675.33	\$8,377
Electric Meter	AC recording ammeter	Each	1	\$8,534.74	\$8,535
Natural Gas					,
Trenching	1'-4' Deep, 1/2 CY excavator	BCY	444	\$7.30	\$3,245
Pipe Bedding	Sand	LCY	166	\$32.23	\$5,347
Backfill	1'-4' Deep, 1/2 CY excavator	BCY	332	\$7.30	\$2,423
Compaction	Compacting bedding in trench	BCY	444	\$5.29	\$2,350
Gas pipe	2" polyethylene; 60 psi	LF	2,000	\$7.50	\$15,005
Pressure regulator valves	Iron and bonze, 2" diameter	Each	1	\$357.50	\$358
Water					
Trenching	4'-6' Deep, 1/2 CY excavator	BCY	1,111	\$9.01	\$10,015
Pipe	4" PVC	LF	2,000	\$8.61	\$17,221
Pipe Bedding	Sand	LCY	249	\$32.23	\$8,021
Compaction		BCY	1,333	\$5.29	\$7,049
Backfill	4'-6' Deep, 1/2 CY excavator	BCY	889	\$7.30	\$6,490
Water meter		Each	1	\$2,900.00	\$2,900
Water	Assumes 80 gpm water demand during use. Assumes HTTD treatment unit is operational 24/7 with a basic production rate	Million	4	\$3,930.00	\$14,888
	of 840 tons/day.	Gallons			•
Water Service Connection	Assumes potable water connection at Lincoln Avenue	LS	1	\$5,000.00	\$5,000
Administrative Costs	Permitting for water utility connection	LS	1	\$5,000.00	\$5,000

Item Description	eavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					\$189,694
Backfilling					
Backfill, borrow, spreading and loading only	common earth, 3/4 CY bucket, front-end loader, includes borrow, loading, and spreading, excludes material - would use clean material from HTTD.	BCY	30,878	\$3.58	\$110,389
Backfill, material only	materials only to replace TSCA soil disposed of off-site.	BCY	1,873	\$15.57	\$29,161
Backfill, transportation to site only	Assumes 10 mile haul	LCY	2,098	\$5.99	\$12,571
Compaction	Vibrating roller, 6" lifts, 2 passes	ECY	30,878	\$1.06	\$32,650
Subtotal					\$184,77 <i>′</i>
Reconstruction					
Erosion and Soil Control Blankets	Biodegradable to temporarily stabilize stream channel/invert until natural growth is established. Only provided in inlet	SY	1,067	\$6.55	\$6,989
Rough Grading of Drainageway Invert	Assumes as 20 foot by 50 foot invert area	EA	1	\$1,325.00	\$1,325
Medium Rip Rap	To armor invert near intersection with OU-2; Includes machine placement for slope protection.	BCY	37	\$65.96	\$2,443
Medium Rip Rap, transportation to site only	Assumes a 10 mile haul	LCY	37	\$5.99	\$222
Subtotal	Produces a 10 mile man	1201	37	ψοιοσ	\$10,979
Site Restoration					· · · · ·
Topsoil	0.5 ft thick over entire excavation area, swell at 12%	LCY	2,612	\$39.88	\$104,180
Hydroseeding	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer for total topsoil area. Includes excavations and inlet areas.	SY	13,995	\$1.49	\$20,859
Plantings	Sandbar Willow/Red Osier Dogwood/Northern Bayberry/Catskill Sand Cherry - 20% of hydroseeded area	SY	2,799	\$15.95	\$44,649
Demobilization		LS	1	\$10,000.00	\$10,000
Subtotal					\$179,687
Physical Barriers/Warnings					
Fence at HTTD Unit	Chain link industrial, 6' H, 6 gauge wire with 3 strands barb wire	LF	1,600	\$30.21	\$48,338
Gate	Double swing gates, incl posts with 12' opening	Each	3	\$1,107.75	\$3,323
Signs	Reflectorized 24"x24" sign mounted to fence	Each	4	\$196.37	\$785
Subtotal					\$52,447
				pital Cost Subtotal:	\$8,667,274
	Adjusted Capital Cost Subt		-		\$8,511,263
		10% Le		e, engineering fees:	\$851,126
				5% Contingencies:	\$1,404,358
Annual Costs			l	otal Capital Cost:	\$10,767,000
Not applicable			T	\$0.00	\$(
Subtotal				Ψ0.00	\$(\$(
			An	nual Cost Subtotal:	\$0
	Adjusted Capital Cost Subt	otal for Alban			\$0
		10% Le		e, engineering fees:	\$0
				5% Contingencies:	\$0 \$0 \$0 \$0 \$0
				nnual Cost Total:	\$0
		30-Ye	ar Present Worth	of Annual Costs:	\$0

Table 3-3a Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
5-Year Costs					
5-year CERCLA reviews		Hr	80	\$120.00	\$9,600
Subtotal					\$9,600
					\$9,600
Adjusted Annual Cost Subtotal for Albany, New York Location Factor (0.982):					
		10% Le	gal, administrative	e, engineering fees:	\$943
		Hr 80 \$120.00 5-Year Cost Subtotal:		\$1,555	
				5-Year Total:	\$11,925
		30-Ye	ar Present Wort	h of 5-Year Costs:	\$34,000
			2014 Total Pr	esent Worth Cost:	\$10,801,000

Key:

ALTA = American Land Title Association

BCY = bulk cubic yard

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CLF = current limiting fuse

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

HTTD = High temperature thermal desorption.

LCY = loose cubic yards

LF = linear foot

LS = lump sum

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

psf = Pounds per square foot.

psi = Pounds per square inch.

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

WWTP = waste water treatment plant

Table 3-3a Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs

Marie Mar	Item Description	Comment	Unit	t Quantity	Unit Cost	Cost
Part	Notes: Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Indev	2014 Markun		
1	Instorical Cost fracts (as obtained from Respectation Collistraction Cost Data 2014 27th Ed.)			•		
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Marian 1988 1989						
Manifer Mani						
Security S						
Event womans 1	assumptions:		2002	04 13770		
1. Foul calculation for INCA contaminated foul volume [150] or Supplies provided to EEEE Policy Supplies (150 or Supplies Policy Supplies Po						
1. Foul settianted FAX Accountational onlow (PUSA) = 20 ppun) =			27	7 623 BCV based on N\S	SDFC shapefiles provided to	FFFPC
Colorate canamate of white with without with without with with an and with with a colorate of with with a colorate of with with with a colorate of wit					DEC shapernes provided to	LLLIC
A contained and violatine Continue Account on the Account on						
Cloth close with contained and Supplications (1942) A production and an						
Total extraction are a 11.240 SF, as obtained EPCC AD department December 2014 SF, as obtained EPCC		healta would be avanuated non OCHA aviil-1i	30	0,0/8 BC I		
### A PRINCA CARCANION INTERFOR CAD department December 2014 Fold and interfact (CAD Accessarian mana 1,240 1,750 1,500 1,5	•	backs would be excavated per OSHA guidelines.				
5. Total estimated TSCA executation area = 6. S471 SE, as obtained TREPEC CAD department December 2014 of 2014 contact sheet and as = 5.00 selection and carea in 25.95 SE 4. Total estimated cape and the excitation and proved in the RI (BEEPC 2014) and typical properties will (wet sitty sand and groved, from Hough, Basic Sold Engineering 1997), in situ bulk density of site will select a sound descriptions from the RI (BEEPC 2014) and typical properties will (wet sitty sand and groved, from Hough, Basic Sold Engineering 1997), in situ bulk density of site will select a sound of a real sold West Harden State (1997), in situ bulk density of site will select a sound of a real sold Medical State (1997), in situ bulk density of site will select a sold the content of the Cape and the Cape a			111 0/0 CE - 1	tained from EEEDC CAE	denoutment December 201	4
c. Folia claimated call back soil aman = 1598 K F 15					-	
A color converted soid area 125.95 15 15 15 15 15 15 15				tained from EEEPC CAL	department December 2014	4
Read on soil descriptions from the RIT (FEFPC 2014) and typical properies soil (wet silty sand and gravel, from Hough, Basic Soils Fagineering, 1957), in-situ bulk density of size soils 1						
Sistis will swell factor assumed 1						
In-study all safet factor assumed = 786 78	. Based on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet silty sand and gravel, from Hough	, Basic Soils Engineering.1957), in-situ bulk density of site soils =		*		
Number of characterization samples for landfill 1 mc lechnical Waste Management Facility (landfill) in Molel City, Nigara County, New York requires PCB samples to eccleented every 1,000 CITy. Number of confinematory samples 607 mc 7 mc	In city coil cwall factor accumed -		70/	1.2 Tons/BCY		
The Chemical Waste Management Facility (andfill) in Model City, Niagara County, New York requires PCB samples to be collected every 1,000 CY. Number of centification samples = 6,046.00 FApproximate perimeters of all nor-TSCA excavation zones = 1,034.50 FT Approximate perimeters of all TSCA excavation zones = 1,034.50 FT Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall subsurface side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface side-wall and 1 subsurface side-wall subs						
Number of confirmatory samples = 607 7 7 7 7 7 7 7 7 7	•	an collected every 1 000 CV	34			
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Aproximate perimeters of all TSCA excavation zones = 1,034.50 FI Number of excavation zones = 26 Sample of excavation zones = 36 Sample of excavation zones Sample of excavation zon						
Number of excavation zones = 26 Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface sidewall and 1 subsurface sidewall sample for every 30 linear feet of perimeter and 1 bottom sample for every 90 SF of bottom area. Maximum excavation depth = 10 ft BGS Basic production rate of HTTD system = 35 Toms/hr 480 Toms/day Fettive porduction rate 75% assumed effective operating rate for maintenance and downtime 630 Toms/day effective production rate 4 Volume of soil to be treated by HTTD unit = 29,005 BCY 0.2 years, or 0. Assuming effective production rate, time to treat excavated 2 months, or 0.2 years, or 1 Moldemob assumed to be = 4 months, or 0.3 years 2. Assume % of treated soil to be used as backfill = 100% 0.3 years 3. Assume % of treated soil to be used as backfill pollume for site restoration = 29,005 BCY, or Treated non-TSCA soils 4. Backfill volume for site restoration = 29,005 BCY, or Treated non-TSCA soil disposed of off-site 5. Assume % reduction by volume of soil from HTTD 29,005 BCY, or Treated non-TSCA soil disposed of off-site 6. Backfill volume for site restoration =						
Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface sidewall and 1 subsurface sidewall sample for every 30 linear feet of perimeter and 1 bottom sample for every 90 SF of bottom area. Maximum excavation depth = 10 ft BGS Basic production rate of HTTD system = 35 Tons/hr Basic production rate of HTTD system = 35 Tons/hr Toffs assumed effective operating rate for maintenance and downtime 630 Tons/day, effective production rate 229,050 Tons/yea; effective production rate 299,050 Tons/yea; effective production rate 290,050 RCY 290,050 RCY 290,050 RCY 290,050 RCY 3. Assuming effective production rate, time to treat excavated 290,050 RCY 290,05						
every 900 SF of bottom area. Maximum excavation depth = 10 ft BGS Basic production rate of HTTD system = 35 Tons/hr Basic production rate of HTTD system = 35 Tons/hr 840 Tons/day, effective operating rate for maintenance and downtime 630 Tons/day, effective production rate 629,950 Tons/year, effective production rate 229,950 Tons/year, effective production rate 229,050 BCY 1. Wob/demob assumed to be = 2 months, or 0.2 years, or 0.3 years 1. Mob/demob assumed to be = 100% 2. Assume % reduction by volume of soil from HTTD treated soil to be used as backfill = 100% 3. Assume % reduction by volume of soil from HTTD treated soil to be used as backfill = 100% 4. Backfill volume for site restoration = 29,005 BCY, or 10 Treated non-TSCA soils 32,485 LCY 4. Backfill volume for site restoration = 1,873 BCY, or 1 Imported soil disposed of off-site 2,098 LCY 1. Moble depth = 100 HTTD treated soil to be used as backfill = 1,873 BCY, or 1 Imported soil disposed of off-site 2,098 LCY		4 2010 DED 10 D 150 1000 1 5 11 11 11 1 5 11			111 1.6	
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840 Tons/day Forward	. Maximum excavation depth =		10 ft BGS			
Second Constant	Basic production rate of HTTD system =		35 Tons/hr			
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Volume of soil to be treated by HTTD unit = 29,005 BCY 1. Assuming effective production rate, time to treat excavated soil = 2 months, or soil = 2 months, or soil = 3 months, or soil =						
2 months, or soil = 0.2 years, or soil = 0.3 years = 0.3 xeame % of treated soil to be used as backfill = 0.3 Assume % reduction by volume of soil from HTTD treatment process = 0.4 Backfill volume for site restoration = 0.3 xeame % of treated soil to be used as backfill = 0.3 Assume % reduction by volume of soil from HTTD treatment process = 0.5 BCY, or 3.2 Treated non-TSCA soils = 0.4 Backfill volume for site restoration = 0.5 BCY, or 1.873 BCY, or 1.873 BCY, or 2.0 Imported soil equal to TSCA soil disposed of off-site 2.098 LCY						
soil = 1. Mob/demob assumed to be = 2. Assume % of treated soil to be used as backfill = 3. Assume % of treated soil to be used as backfill = 3. Assume % reduction by volume of soil from HTTD treatment process = 4. Backfill volume for site restoration = 29,005 BCY, or Treated non-TSCA soils 32,485 LCY 1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site 2,098 LCY	. Volume of soil to be treated by HTTD unit =					
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2. Assume % of treated soil to be used as backfill = 3. Assume % reduction by volume of soil from HTTD treatment process = 4. Backfill volume for site restoration = 29,005 BCY, or 32,485 LCY 1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site 2,098 LCY	Mah/damah assumed to ha —		1 months	n 02	Agre	
3. Assume % reduction by volume of soil from HTTD treatment process = 4. Backfill volume for site restoration = 29,005 BCY, or Treated non-TSCA soils 32,485 LCY 1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site 2,098 LCY			,	0.3 y	Ca18	
treatment process = 4. Backfill volume for site restoration = 29,005 BCY, or Treated non-TSCA soils 32,485 LCY 1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site 2,098 LCY						
4. Backfill volume for site restoration = 29,005 BCY, or Treated non-TSCA soils 32,485 LCY 1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site 2,098 LCY	·		U%			
32,485 LCY 1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site 2,098 LCY			29.005 RCV or	Treated non-TSCA	soils	
1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site 2,098 LCY	Davidin Totalic for site restoration –			Trunca non-19CA	. 50113	
2,098 LCY			*	Imported soil equa	I to TSCA soil disposed of o	off-site
				imported son equal	to 15011 son disposed of 0	,11-910C
	5. Topsoil volume for site restoration (1) 5ft thick) -					

Table 3-3a Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
16. Assumed production rate of backfill =		550 BCY/day			
550 LCY/day for backfill per RSMeans Site Work & Landscape Cost Data 2013 31.23.23.15.4050 (Crew	B-10R) includes 1 equp. Operator, 0.5 labor, and 1 front end loader, 1 CY bucket				
			-		
17. Assuming effective production rate, time to backfill soil =		75 days, or	3.0 mo	nths	
18. Assumed production rate of compaction =		2,600 ECY/day	sumed effective production rate CY/day, effective production rate ys, or 3.0 months CY/day sumed effective production rate CY/day, effective production rate ys, or 1.0 months CY Ins (or 2 samples every day) Ins (or every other day) SY SY SY SY SY SY SY SY SY S		
2600 ECY/day for compaction per RSMeans Site Work & Landscape Cost Data, 32nd Edition, 31.23.23.2	23.6200				
		75% assumed effe	ective production rate		
		1,950 BCY/day, ef	fective production rate		
19. Assuming effective production rate, time to compact soil =		16 days, or	1.0 mo	nths	
20. Assume tree planting over 20% of hydroseeded area =		2,799 SY			
21. Volume of hazardous TSCA soil disposed off-site =		1,784 BCY	or 3.0 months day ed effective production rate day, effective production rate or 1.0 months		
22 No storage facilities are assumed for treated or untreated soil. However, these facilities may be added at a	later time.		(or 2 samples every day)		
23. Soil testing for unit assumes:					
Influent - 1 sample for every		315 Tons (or 2 sa	amples every day)		
Effluent - 1 sample for every					
24. The average distance from the treatment facility to		500 ft	•		
excavation is approximately					
25. Electrical connection for HTTD system					
Assumes the distance from the treatment facility to electrical		2,000 ft			
Electrical wiring assumes #10		3,000 ft			
Assuming 3 - 1/0 wires from treatment facility to		6,300 ft			
electrical connection					
25. Natural gas connection for HTTD system					
Assumes the distance from the treatment facility to natural ga		2,000 ft			
Width of electric and natural gas trench		2 ft			
Depth of electric and natural gas trench		3 ft			
Depth of pipe bedding (natural gas)		1 ft			
Depth of backfill (natural gas)		2 ft			
26. Water connection for HTTD system					
Assumes the distance from the treatment facility to water cor		2,000 ft			
Depth of water pipe trench		5 ft			
Width of water pipe trench		3 ft			
Depth of pipe bedding (water line)		1 ft			
Depth of backfill (water line)		4 ft			
27. Conversion from feet cubed to cubic yards		0.0370			
28. Assumedd area of inlet restoration		15,000 SF			
length =		300 ft			
width =		50 ft			
29. Assumed volume of rip-rap					
length =		50 ft			
width =		20 ft			
area =		1,000 SF			
Assumed height of rip-rap =		1.0 ft			
Volume =		37 LCY			
30. Assumed duration of inlet restoration =			10 ma	nthe	
31. Demobilization of treatment unit is not included.		15 days, or	1.0 MO	111113	
		100/			
32. For loose soil assume sandy, dry soil with swell factor =		12%			
(Means Estimating Handbook. United States of America: Means Southern Construction Information Networks (Means Estimating Handbook. United States of America: Means Southern Construction Information Networks)	WOIK, 1990).	100 707			
33. Topsoil density assumed to be =		1.2 Tons/LCY			
34. Fire protection for treatment facility not included in this estimate.	a				
35. This estimate assumes use of existing concrete foundation at the site can be used as a base for placement of	f treatment facility.				
36. Assumed length of perimeter fence =		2,600 LF, as obtain	ned from EEEPC CAD of	department December	2014

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Table 3-3a Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
77. Assumed total duration of site work =		230 days, or	8.0 n	nonths	<u> </u>
8. Present value of costs assumes 5% annual interest rate.					
9. HTTD costs supplied by vendor, Environmental Soil Management, Inc. (ESMI), June 2	007. Other unit costs listed were obtained from 2014 RS Means Cost Data and engineering ju	dgement.			
0. Local sales tax for soil disposal		6% Per WasteMa	nagement quote fron	September 3, 2013	
41. Soil transport fuel surcharge		40% Per WasteMa	nagement quote fron	September 3, 2013	
42. New York sales tax for disposal services		8% Per WasteMa	nagement quote fron	September 3, 2013	
43. Sheetpiling					
Maximum excavation depth (basis for sheetwall selection) =		15 ft BGS			
Length of sheet piling anticipated =		1,500 ft			
Area of sheet piling =		22,500 SF			
Weight of sheet piling =		22 psf			
Total Weight Needed =		248 Ton			
4. Assumes grubbed material will consist of native species that can be reincorporated into	he site during backfill and restoration. Assumes the volume of grubbed material to have a neg	lible impact.			

02:EN-003286-0001-02-B3994

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Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Construction Management (2.5% of total capital cos	t Includes submittals, reporting, meetings over 200 day duration	LS	1	\$140,750.70	\$140,73
Institutional Controls		Each	1	\$5,700.00	\$5,70
Subtotal					\$146,45
Site Preparation					
Mobilization	Excludes HTTD Unit Mobilization (see HTTD (Installation))	LS	1	\$10,000.00	\$10,00
Surveying Crew	1-person crew @ \$100/hr., 8hr/day; assume 30% of project duration	Day	60	\$800.00	\$48,00
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,00
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	1,600	\$7.05	\$11,27
Site Services	NYSDEC Field Office 200 Day Duration	DAY	200	\$500.00	\$100,00
Temporary Utility tie in for HTTD unit	80 GPM non-potable and 3 phase/480V/1200 amp (Generator is available through EMSI)	LS	1	\$6,000.00	\$6,00
Construct Decontamination Pad & Containment	For equipment & personnel	Setups	2	\$7,000.00	\$14,00
Clearing and Grubbing	Estimated surface area of excavations per Figure 1-1. Cutbacks assumed to add 5%. Includes inlet area to be restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	SY	7,583	\$1.84	\$13,97
HTTD Unit Proof of Performance Testing	Verify destruction removal efficiency of contaminants and particulate emissions, etc. for permit-equivalency required by RCRA permit. RCRA permit itself, not included.	Each	1	\$100,000.00	\$100,00
Subtotal					\$323,25
Health and Safety					. ,
Health and Safety	HSO, CAMP and Security Reporting	DAY	200	\$958.33	\$191,66
Subtotal					\$191,66
Excavation					
Sheet Piling, Drive, Extract & Salvage	15' Deep excavation (max)	ton	248	\$2,039.27	\$504,72
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	ВСҮ	1,873	\$15.00	\$28,09
Excavation - Non TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	BCY	16,437	\$15.00	\$246,55
Stockpiling (prior to treatment)	300 Horsepower Bulldozer w/ 50' haul, includes cut-back volume	BCY	16,437	\$1.71	\$28,14
Stockpiling (after treatment)	300 Horsepower Bulldozer w/ 50' haul, includes cut-back volume	BCY	16,437	\$1.71	\$28,14
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr./day	Day	76	\$3,193.35	\$242,98
PCB Wastewater Treatment during Remediation of Drainageway Sediment	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050 Fill and 3" Portable Trash Pump 300 GPM	LS	1	\$27,653.00	\$27,65
Dramage way bediment			1 1		

Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment. Alternative 4. CP-51 SCOs

Item Description	ation and On-Site Thermal Treatment, Alternative 4, CP-51 SCOs Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
	Includes submittals, reporting, meetings over 200 day duration	LS	1	\$140,750.70	\$140,751
Institutional Controls		Each	1	\$5,700.00	\$5,700
Subtotal		•		. ,	\$146,451
Site Preparation					· ,
Mobilization	Excludes HTTD Unit Mobilization (see HTTD (Installation))	LS	1	\$10,000.00	\$10,000
Surveying Crew	1-person crew @ \$100/hr., 8hr/day; assume 30% of project duration	Day	60	\$800.00	\$48,000
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	1,600	\$7.05	\$11,279
Site Services	NYSDEC Field Office 200 Day Duration	DAY	200	\$500.00	\$100,000
Temporary Utility tie in for HTTD unit	80 GPM non-potable and 3 phase/480V/1200 amp (Generator is available through EMSI)	LS	1	\$6,000.00	\$6,000
Construct Decontamination Pad & Containment	For equipment & personnel	Setups	2	\$7,000.00	\$14,000
Clearing and Grubbing	Estimated surface area of excavations per Figure 1-1. Cutbacks assumed to add 5%. Includes inlet area to be restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	SY	7,583	\$1.84	\$13,974
HTTD Unit Proof of Performance Testing	Verify destruction removal efficiency of contaminants and particulate emissions, etc. for permit-equivalency required by RCRA permit. RCRA permit itself, not included.	Each	1	\$100,000.00	\$100,000
Subtotal		•	•		\$323,253
Health and Safety					
Health and Safety	HSO, CAMP and Security Reporting	DAY	200	\$958.33	\$191,667
Subtotal		·			\$191,667
Excavation					,
Sheet Piling, Drive, Extract & Salvage	15' Deep excavation (max)	ton	248	\$2,039.27	\$504,721
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation	BCY	1,873	\$15.00	\$28,098
Excavation - Non TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation	BCY	16,437	\$15.00	\$246,559
	zones.	D GT 1	1.5.10	0.4 7.4	\$20.1.10
Stockpiling (prior to treatment)	300 Horsepower Bulldozer w/ 50' haul, includes cut-back volume	BCY	16,437	\$1.71	\$28,140
Stockpiling (after treatment)	300 Horsepower Bulldozer w/ 50' haul, includes cut-back volume	BCY	16,437	\$1.71	\$28,140
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr./day	Day	76	\$3,193.35	\$242,980
PCB Wastewater Treatment during Remediation of Drainageway Sediment	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050 Fill and 3" Portable Trash Pump 300 GPM	LS	1	\$27,653.00	\$27,653
Confirmation/Documentation Sampling - EPA SW-846, Method SW-8082	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with over 300 liner feet of perimeter.	Each	546	\$208.33	\$113,750
Off-Site Disposal of Hazardous Soil (PCBs >= 50	npm)				
Waste Characterization Sampling	As reg'd to satisfy off-site Landfill Requirements for TSCA soil disposal	Each	20	\$208.33	\$4,167
PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276	\$78.04	\$177,606
Subtotal		1			\$1,664,200
High Temperature Thermal Desorption					Ţ1,00 1,200
HTTD (Installation)	Includes mob/demob, equipment, labor, permitting (if necessary)	LS	1	\$107,120.81	\$107,121
HTTD (Instantation) HTTD (Treatment)	Includes equipment, labor, maintenance, utilities	Ton	19,971	\$142.81	\$2,852,117
Soil Testing (influent)	Includes TCL PCBs (Engineers Allowance for operational days)	Each	63	\$208.33	\$13,209
Soil Testing (influent) Soil Testing (effluent)	Includes TCL PCBs (Engineers Allowance for operational days)	Each	16	\$208.33	\$3,302
Subtotal	Includes 1-221-225 (Engineers rinowance for operational adys)	Lacii	10	Ψ200.33	\$2,975,748

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Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Utilities					
Electrical					
Electric Utility Pole	Wooden pole, 40' high	Each	1	\$1,586.10	\$1,586
Wiring to Electric Service	3 - 1/0 Wires	CLF	63	\$468.28	\$29,502
Wiring Connections to treatment facility	200 amp w/ 18 branch breakers, includes main breaker, meter, socket, panel board, ground rod (20' avg runs, #14/2 wiring)	EA	4	\$2,844.91	\$11,380
Switchboard	1200 amp	EA	1	\$7,200.40	\$7,200
Transformer	Dry type transformer, 3 Phase, 500 kVA	EA	1	\$14,904.33	\$14,904
Electrical Connection Fee		LS	1	\$2,900.00	\$2,900
Install Electrical Connections/Testing	0.25 Electrician Foreman, 1 electrician, 2 laborers	Day	5	\$1,675.33	\$8,377
Electric Meter	AC recording ammeter	Each	1	\$8,534.74	\$8,535
Natural Gas					
Trenching	1'-4' Deep, 1/2 CY excavator	BCY	444	\$7.30	\$3,245
Pipe Bedding	Sand	LCY	166	\$32.23	\$5,347
Backfill	1'-4' Deep, 1/2 CY excavator	BCY	332	\$7.30	\$2,423
Compaction	Compacting bedding in trench	BCY	444	\$5.29	\$2,350
Gas pipe	2" polyethylene; 60 psi	LF	2,000	\$7.50	\$15,005
Pressure regulator valves	Iron and bonze, 2" diameter	Each	1	\$357.50	\$358
Water					
Trenching	4'-6' Deep, 1/2 CY excavator	BCY	1,111	\$9.01	\$10,015
Pipe	4" PVC	LF	2,000	\$8.61	\$17,221
Pipe Bedding	Sand	LCY	249	\$32.23	\$8,021
Compaction		BCY	1,333	\$5.29	\$7,049
Backfill	4'-6' Deep, 1/2 CY excavator	BCY	889	\$7.30	\$6,490
Water meter		Each	1	\$2,900.00	\$2,900
Water	Assumes 80 gpm water demand during use. Assumes HTTD treatment unit is operational 24/7 with a basic production rate	Million Gal	2	\$3,930.00	\$8,437
	of 840 tons/day.				
Water Service Connection	Assumes potable water connection at Lincoln Avenue	LS	1	\$5,000.00	\$5,000
Administrative Costs	Permitting for water utility connection	LS	1	\$5,000.00	\$5,000

Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
5-Year Costs					
5-year CERCLA reviews		Hr	80	\$120.00	\$9,600
Subtotal					\$9,600
			5-	Year Cost Subtotal:	\$9,600
	Adjusted Annual Cost Subto				\$9,427
		10% Le	gal, administrativ	e, engineering fees:	\$943
			•	15% Contingencies:	\$1,555
				5-Year Total:	\$11,925
		30-Ye	ar Present Wort	h of 5-Year Costs:	\$34,000
				·	
			2014 Total Pr	esent Worth Cost:	\$7,210,000

Key:

ALTA = American Land Title Association

BCY = bulk cubic yard

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CLF = current limiting fuse

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

HTTD = High temperature thermal desorption.

LCY = loose cubic yards

LF = linear foot

LS = lump sum

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

psf = Pounds per square foot.

psi = Pounds per square inch.

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, CP-51 SCOs

Item Description	Comment	Un	it Qu	antity	Unit Cost	Cost
otes:		L I	20143	Montana		
istorical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Index 1/1/2014	2014 N 100	-		
		2013	99	none 101%		
		2013	96	101%		
		2012	91	110%		
		2007	84	120%		
		2006	80	125%		
		2002	64	157%		
ssumptions:		2002	04	13770		
Excavation volumes						
a. Total estimated non-TSCA contaminated soil volume =		1	5 655 BCY 1	pased on N\SD	EC shapefiles provided	to EEEPC
b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) =			1,784 Decem		20 shapeines provided	to EEEI C
c. Total estimated cut-back soil volumes=			872 BCY	JUL 2011		
d. Total excavated soil volume =		1	8,310 BCY			
Cut-backs were estimated at 5% of total soil volume, because cut-backs would overlap with excavation	n zones. Actual cut-backs would be excavated per OSHA midelines	1	.0,510 DC1			
Total excavation area =	in Zones. Actual cut-backs would be excavated per Obtin guidelines.					
a. Non-TSCA excavation area =		56 276 SF as o	htained from F	EEEPC CAD A	lepartment December 20)14
b. Total estimated TSCA excavation area =					lepartment December 20	
c. Total estimated cut-back soil area =		3,250 SF	otanica nom i	LLLI C CAD u	icpartment December 20	,14
d. Total excavated soil area =		68,243 SF				
Based on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet silty sand and g	gravel from Hough Pagic Soils Engineering 1057) in city bulk dencity of cita soils -	00,243 31	90.0 lbs/cf,	0.5		
based on son descriptions from the KI (EEEI C 2014) and typical properties son (wet sirty said and g	graver, from Hough, basic sons Engineering. 1937), in-situ buik density of site sons –		1.2 Tons/B			
In-situ soil swell factor assumed =		7%	1.2 Tolls/D	C1		
Number of characterization samples for landfill =		20				
The Chemical Waste Management Facility (landfill) in Model City, Niagara County, New York requir	res PCR samples to be collected every 1 000 CV	20				
Number of confirmatory samples =	ies I CB samples to be conceied every 1,000 C1.	546				
Approximate perimeters of all non-TSCA excavation zones =		6,046.00 FT				
Approximate perimeters of all TSCA excavation zones =		1,034.50 FT				
Number of excavation zones =		1,054.50 11				
Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation	n and Remediation May 2010 DER-10 Page 156 of 226: 1 surface sidewall and 1 subsurface side		inear feet of n	erimeter and 1	bottom sample for	
every 900 SF of bottom area.	in and remediation thay 2010 DER 10 Tage 130 of 220. I surface sidewait and I substitute side	lewan sample for every 50 i	inicui rect or p	crimeter and r	bottom sample for	
Maximum excavation depth =		10 ft BGS				
Basic production rate of HTTD system =		35 Tons/hr				
Basic production rate of 1111D system =		840 Tons/da	V.			
				rating rate for i	maintenance and downti	ime
			y, effective pro		mamenance and downer	
		229,950 Tons/yea				
Volume of soil to be treated by HTTD unit =		16,437 BCY	, criccure pi	Saucion fait		
O. Assuming effective production rate, time to treat excavated		1 months,	or	0.1 year	rs. or	
soil =		i montus,	~-	5.1 yea	,	
. Mob/demob assumed to be =		4 months,	or	0.3 year	rs	
2. Assume % of treated soil to be used as backfill =		100%				
3. Assume % reduction by volume of soil from HTTD		0%				
treatment process =						
4. Backfill volume for site restoration =		16,437 BCY, or	Treated	l non-TSCA so	oils	
		18,410 LCY				
		1,873 BCY, or	Importe	ed soil equal to	o TSCA soil disposed of	off-site
		2,098 LCY				
5. Topsoil volume for site restoration (0.5ft thick) =		2,098 EC 1 161 BCY, or				

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Final Adk Stl OU-3 FS Addendum Cost Estimates 121614.xlsx-3-3b Exc & OnSite Thermal Treat-12/18/2014

Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, CP-51 SCOs

Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment, A Item Description	Comment	Unit Quantity Unit Cost Cost
16. Assumed production rate of backfill =		550 BCY/day
550 LCY/day for backfill per RSMeans Site Work & Landscape Cost Data 2013 31.23.23.15.4050 (Crew B-10R) in	ncludes 1 equp. Operator, 0.5 labor, and 1 front end loader, 1 CY bucket	
		75% assumed effective production rate
		413 BCY/day, effective production rate
17. Assuming effective production rate, time to backfill soil =		44 days, or 2.0 months
18. Assumed production rate of compaction =		2,600 ECY/day
2600 ECY/day for compaction per RSMeans Site Work & Landscape Cost Data, 32nd Edition, 31.23.23.23.6200		
		75% assumed effective production rate
		1,950 BCY/day, effective production rate
19. Assuming effective production rate, time to compact soil =		9 days, or 1.0 months
20. Assume tree planting over 20% of hydroseeded area =		1,517 SY
21. Volume of hazardous TSCA soil disposed off-site =		1,784 BCY
22 No storage facilities are assumed for treated or untreated soil. However, these facilities may be added at a later time.		
23. Soil testing for unit assumes:		
Influent - 1 sample for every		315 Tons (or 2 samples every day)
Effluent - 1 sample for every		1,260 Tons (or every other day)
24. The average distance from the treatment facility to		500 ft
excavation is approximately		
25. Electrical connection for HTTD system		
Assumes the distance from the treatment facility to electrical		2,000 ft
Electrical wiring assumes #10		3,000 ft
Assuming 3 - 1/0 wires from treatment facility to		6,300 ft
electrical connection		
25. Natural gas connection for HTTD system		
Assumes the distance from the treatment facility to natural ga		2,000 ft
Width of electric and natural gas trench		2 ft
Depth of electric and natural gas trench		3 ft
Depth of pipe bedding (natural gas)		1 ft
Depth of backfill (natural gas)		2 ft
26. Natural gas connection for HTTD system		
Assumes the distance from the treatment facility to water cor		2,000 ft
Depth of water pipe trench		5 ft
Width of water pipe trench		3 ft
Depth of pipe bedding (water line)		1 ft
Depth of backfill (water line)		4 ft
27. Conversion from feet cubed to cubic yards		0.0370
28. Assumedd area of inlet restoration		15,000 SF
length =		300 ft
width =		50 ft
29. Assumed volume of rip-rap		
length =		50 ft
width =		20 ft
area =		1,000 SF
Assumed height of rip-rap =		1.0 ft
Volume =		37 LCY
30. Assumed duration of inlet restoration =		15 days, or 1.0 months
31. Demobilization of treatment unit is not included.		
32. For loose soil assume sandy, dry soil with swell factor =		12%
(Means Estimating Handbook. United States of America: Means Southern Construction Information Network, 1990	0).	
33. Topsoil density assumed to be =	- <i>/</i> -	1.2 Tons/LCY
34. Fire protection for treatment facility not included in this estimate.		I TORUM DO I
35. This estimate assumes use of existing concrete foundation at the site can be used as a base for placement of treatment	t facility.	
36. Assumed length of perimeter fence =	· manny.	2,600 LF, as obtained from EEEPC CAD department December 2014
50. Assumed longin of perimeter refree –		2,000 L1, as obtained from LLLI C CAD department December 2014

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Table 3-3b Revised Cost Estimate for Excavation and On-Site Thermal Treatment, Alternative 4, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost	
37. Assumed total duration of site work =		200 days, or	7.0 1	months		
38. Present value of costs assumes 5% annual interest rate.						
9. HTTD costs supplied by vendor, Environmental Soil Management, Inc. (ESMI), June 2007. Oth	ner unit costs listed were obtained from 2014 RS Means Cost Data and engineering judge	ement.				
0. Local sales tax for soil disposal		6% Per WasteN	Ianagement quote fror	n September 3, 2013		
1. Soil transport fuel surcharge		40% Per WasteN	Ianagement quote fror	n September 3, 2013		
2. New York sales tax for disposal services		8% Per WasteManagement quote from September 3, 2013				
3. Sheetpiling						
Maximum excavation depth (basis for sheetwall selection) =		15 ft BGS				
Length of sheet piling anticipated =		1,500 ft				
Area of sheet piling =		22,500 SF				
Weight of sheet piling =		22 psf				
Total Weight Needed =		248 Ton				
4. Assumes grubbed material will consist of native species that can be reincorporated into the site du	uring backfill and restoration. Assumes the volume of grubbed material to have a neglible	e impact.				

Table 3-4a Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Construction Management (2.5% of total	Includes submittals, reporting, meetings over 20 month duration	LS	1	\$334,243.43	\$334,243
capital cost)	line to the substitution of the substitution o			400 1,2 101 10	Ψου .,= .ο
Treatability Study		LS	1	\$50,000.00	\$50,000
Institutional Controls		Each	1	\$5,700.00	\$5,700
Subtotal		Eacii	1	\$3,700.00	\$3,700
Site Preparation					ψ509,940
	1-person crew @ \$100/hr., 8hr/day; assume 30% of project duration	Day	186	\$800.00	\$148,800
Surveying Crew	1-person crew & \$100/m., om/day, assume 50% of project duration	Day	100	\$600.00	\$140,000
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	2,600	\$7.05	\$18,328
Site Services	NYSDEC Field Office 20 Month Duration	DAY	620	\$500.00	\$310,000
Clearing and Grubbing	Estimated surface area of TSCA excavation and treatment area, Includes inlet area to be restored where the drainage ditch	SY	13,995	\$1.84	\$25,791
	in OU-3 intersects the drainage ditch in OU-2.		ŕ		,
Construct Decontamination Pad & Containment	For equipment & personnel	Setups	2	\$7,000.00	\$14,000
Health and Safety	TYPO CLAMB 10 1 B 1	DAY	(20	Φ2 222 00	Φ1 44 <i>c</i> 4 <i>c</i> 6
Health and Safety	HSO, CAMP and Security Reporting	DAY	620	\$2,333.00	\$1,446,460
Subtotal					\$1,983,380
Excavation		I 5	40.0	\$2.102.25	44.754.00
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr./day during 80% of soil stabilization and solidification	Day	493	\$3,193.35	\$1,574,083
PCB Wastewater Treatment during	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050	LS	1	\$27,653.00	\$27,653
Remediation of Drainageway and Sediments	Fill and 3" Portable Trash Pump 300 GPM				
until solidification and restoration are is	The same of a same of a same poor of				
complete					
Excavation - TSCA Soil	Day EC Adder dray Eigens 1.1 Cuthods unlarge segment to add 50/ Most out hooks would avail an align out treatment	DCV	1 072	¢15.00	\$20,000
Excavation - 1SCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent treatment	BCY	1,873	\$15.00	\$28,098
TSCA Level PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276	\$78.04	\$177,606
Waste Characterization Sampling	As req'd to satisfy off-site Landfill Requirements for TSCA soil disposal	Each	2,270	\$206.00	\$618
Confirmation Sampling - EPA SW-846,	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with	Each	134		\$16,771
		Lacii	134	\$123.10	\$10,771
Method SW-8082 Excavate Landfill Area for excess solidified	over 300 liner feet of perimeter for TSCA areas. stockpile clean soil and topsoil for cover 85' x 85' x 8' deep	CY	2,397	\$15.00	\$35,955
	stockpile clean son and topson for cover 83 x 83 x 8 deep		2,397	\$15.00	\$33,93.
PCB soil Subtotal					\$2,123,170
In Situ Stabilization and Solidification					ΨΖ, 1ΖΟ, 17 C
	Assumes two Coo Con Everyoter Mounted Auger w/ prossure food mobile Miver, assume 50/ increase in volume due to	CY	27,623	\$325.50	\$8,991,519
Soil Augering and Amendment	Assumes two Geo-Con Excavator Mounted Auger w/ pressure feed mobile Mixer, assume 5% increase in volume due to	CI	27,023	\$525.50	\$6,991,319
	overlapping augering grid, includes fuel, electricity, water, maintenance, labor, mobilization and demobilization. Does not				
	include site preparations.				
Post-cure testing for performance	TCLP testing to document solidification/ stabilization performance	LS	1	\$20,000.00	\$20,000
Subtotal				+==,000.00	\$9,011,519
Utility Connections					
Electrical					
Electric Utility Pole	Wooden pole, 40' high	Each	1	\$1,586.10	\$1,586
Wiring to Electric Service	3 - 1/0 Wires	CLF	63	\$468.28	\$29,502
Wiring Connections to treatment facility	200 amp w/ 18 branch breakers, includes main breaker, meter, socket, panel board, ground rod (20' avg runs, #14/2 wiring)		4	\$2,844.91	\$11,380
	The state of the s		,	+2,0.11,71	Ψ11,000

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Table 3-4a Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost	
Switchboard	1200 amp	EA	1	\$7,200.40	\$7,200	
Transformer	Dry type transformer, 3 Phase, 500 kVA	EA	1	\$14,904.33	\$14,904	
Electrical Connection Fee		LS	1	\$2,900.00	\$2,900	
Install Electrical Connections/Testing	0.25 Electrician Foreman, 1 electrician, 2 laborers	Day	5	\$1,675.33	\$8,377	
Electric Meter	AC recording ammeter	Each	1	\$8,534.74	\$8,535	
Water					·	
Trenching	4'-6' Deep, 1/2 CY excavator	BCY	1,111	\$9.01	\$10,015	
Pipe	4" PVC	LF	2,000	\$8.61	\$17,221	
Pipe Bedding	Sand	LCY	249	\$32.23	\$8,021	
Compaction		BCY	1,111	\$5.29	\$5,874	
Backfill	4'-6' Deep, 1/2 CY excavator	BCY	996	\$7.30	\$7,269	
Water meter		Each	1	\$2,900.00	\$2,900	
Water Service Connection	Assumes potable water connection at Lincoln Avenue	LS	1	\$5,000.00	\$5,000	
Administrative Costs	Permitting for water utility connection	LS	1	\$5,000.00	\$5,000	
Subtotal					\$145,682	
Site Restoration						
Topsoil	0.5 ft thick over entire excavation area, swell at 12%	LCY	317	\$39.60	\$12,542	
Restore Drainageway Invert	Includes 95% Compaction	CY	296	\$19.41	\$5,745	
Erosion and Soil Control Blanket	Biodegradable blankets to temporarily stabilize invert and slopes until natural growth is established	SY	1,556	\$6.55	\$10,192	
Medium Rip Rap	To armor invert near intersection with OU-2; Includes trucking and Installation	TON	24	\$75.50	\$1,812	
Backfill Landfill Area	includes redistribution and compaction of clean soil for Cap	CY	2,397	\$19.41	\$46,526	
Hydroseeding	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer	SY	1,775	\$1.48	\$2,627	
Hydroseed Cap	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer	SY	802	\$1.48	\$1,187	
Plantings	Sandbar Willow/Red Osier Dogwood/Northern Bayberry/Catskill Sand Cherry, in 40% of hydroseeded area	SY	710	\$15.84	\$11,246	
Demobilization		LS	1	\$10,000.00	\$10,000	
Subtotal		LIG		φ10,000.00	\$101,877	
Gate	Double swing gates, incl posts with 12' opening	Each	3	\$1,107.75	\$3,323	
Signs	Reflectorized 24"x24" sign mounted to fence	Each	4	\$196.37	\$785	
Subtotal	remediated 2 + M2 + Sign mounted to remed	Eucii	,	Ψ170.57	\$4,109	
Captotal			Capital	Cost Subtotal:	\$13,759,681	
	Adjusted Capital Cost Subt	otal for Albany, New			\$13,512,007	
	10% Legal, administra				\$1,351,201	
15% Contingencies:						
				Capital Cost:	\$2,229,481 \$17,093,00 0	
Annual Costs						
Not Applicable				\$0.00	\$0	
Subtotal					\$0 \$0	
				Cost Subtotal:	\$0	
	Adjusted Capital Cost Subt				\$0 \$0 \$0 \$0 \$0	
		10% Legal, adr			\$0	
				Contingencies:	\$0	
		00.1/		al Cost Total:	\$0	
		30-Year Pres	ent Worth of A	Annual Costs:	\$0	

Table 3-4a Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
5-Year Costs (Periodic Costs)					
5-year CERCLA reviews	Ht		80	\$120.00	\$9,600
Subtotal					\$9,600
				Cost Subtotal:	\$9,600
	Adjusted Annual Cost Subtotal for Alb				\$9,427
	10%	Legal, adr	ministrative, en	gineering fees:	\$943
			15% (Contingencies:	\$1,555
				5-Year Total:	\$11,925
	30-	Year Pres	sent Worth of	5-Year Costs:	\$34,000
		2014	1 Total Presen	t Worth Cost:	\$17,127,000

Key:

ALTA = American Land Title Association

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CLF = current limiting fuse

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

LCY = loose cubic yards

LF = linear foot

LS = lump sum

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

Table 3-4a Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, Part 375 Restricted-Commercial SCOs

Item Description	Comment	Uı	nit Quantit	y Unit Cost	Cost
Notes: Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed	D	Index	Markup		
1.000.100.1 Cost 1.00.1 (as common 1.00.1 1.00.1 1.00.1 1.00.1 1.00.1 1.00.1 1.00.1 1.00.1 1.00.1 1.00.1 1.00.1	·/	1/1/2014		one	
		2013		1%	
		2012		4%	
		2007		0%	
		2006	80 12	5%	
		2002	64 15	7%	
		2000	60 16	8%	
		1989	46 21	8%	
Assumptions:					
1. Soil Volumes					
a. Total estimated non-TSCA contaminated soil volume for treatment =			27,623 BCY, based	on N\SDEC shapefiles	provided to
b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) =			1,784 EEEPC Dec	ember 2014	
c. Total estimated cut-back soil volume for TSCA contaminated soil volume=			89 BCY		
d. Total excavated soil volume for off-site disposal =			1,873 BCY		
Cut-backs were estimated at 5% of total soil volume, because cut-backs would overlap with adjacent	acent treatment zones. Actual cut-backs would be excavated per OSHA guidelines.				
2. Surface Areas =					
a. Non-TSCA treatment area =		111,240 SF, as o	btained from EEEPC	CAD department Dece	ember 2014
b. Estimated TSCA excavation area =		8,717 SF, as o	btained from EEEPC	CAD department Dece	ember 2014
c. Total estimated cut-back soil area =		5,998 SF			
d. Total excavated soil area =		14,715 SF			
3. Based on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet silty sand	d and gravel, from Hough, Basic Soils Engineering.1957), in-situ bulk density of site soils =		90.0 lbs/cf		
4. In-situ soil swell factor assumed =		7%			
5. Number of characterization samples for landfill =		3			
The Chemical Waste Management Facility (landfill) in Model City, Niagara County, New York	requires PCB samples to be collected every 1,000 CY.				
6. Number of confirmatory samples in TSCA excavations =		134			
Approximate perimeters of all TSCA excavation zones =		1,034.50 FT			
Number of excavation zones =		7			
Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investi sample for every 900 SF of bottom area.	tigation and Remediation May 2010 DER-10 Page 156 of 226: 1 surface sidewall and 1 subsurface s	sidewall sample for eve	ry 30 linear feet of pe	rimeter and 1 bottom	
7. Local sales tax for soil disposal		6% Per Was	steManagement quote	from September 3, 20	13
8. Soil transport fuel surcharge				from September 3, 20	
9. New York sales tax for disposal services				from September 3, 20	
10. Average reported production rate of in situ stabilization/ solidification = 1,000 cubic yards per	r 1.1 Months (USEPA Solidification/Stabilization Use at Superfund Sites (EPA-542-R-00-010))			•	
	•	60 BCY/da	y		
		75% assumed	l effective operating r	ate for maintenance an	d downtime
			y, effective production		
		616 days, or		20.0 months	
Assumed duration of TSCA soil excavation =		15 days			
11. Mob/demob duration assumed to be =		60 days, or		2.0 months	
12. Assumed site grades would be increased due to the addition of binder materials for stabilizatio	on and as a result additional work would be required to regrade drainage way.				
13. Assumed topsoil would be required only in TSCA excavation area and that the concrete monol	lithic block resulting from stabilization would be utilized in future site development.				
14. Assumed duration of topsoil placement and compaction =		5 days			
15. Assumed duration of inlet restoration =		15 days, or			
16. Assumed total duration of site work =		620 days, or	2	20.0 months	
17. Present value of costs assumes 5% annual					

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interest rate.

Table 3-4a Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, Part 375 Restricted-Commercial SCOs

18. Electrical connection for S/S processes Assumes the distance from the treatment facility to elec Electrical wiring assumes #10 Assuming 3 - 1/0 wires from treatment facility to electrical connection 19. Water connection for S/S processes Assumes the distance from the treatment facility to wat Depth of water pipe trench Width of water pipe trench Depth of pipe bedding (water line) 18. Electrical connection for S/S processes 2,000 ft 2,000 ft 3 ft 4 ft	Item Description	Comment	Į	Unit	Quantity	Unit Cost	Cost
Electrical wiring assumes #10 Assuming 3 - 1/0 wires from treatment facility to electrical connection 19. Water connection for S/S processes Assumes the distance from the treatment facility to wat Depth of water pipe trench Width of water pipe trench Under the pi	18. Electrical connection for S/S processes						
Assuming 3 - 1/0 wires from treatment facility to electrical connection 19. Water connection for S/S processes Assumes the distance from the treatment facility to wat Depth of water pipe trench Width of water pipe trench Depth of pipe bedding (water line) 6,300 ft 2,000 ft 5 ft 1 ft	Assumes the distance from the treatment facility to elec	2,00	0 ft				
electrical connection 19. Water connection for S/S processes Assumes the distance from the treatment facility to wat Depth of water pipe trench Width of water pipe trench Depth of pipe bedding (water line) 1 ft	Electrical wiring assumes #10	3,00	0 ft				
19. Water connection for S/S processes Assumes the distance from the treatment facility to wat Depth of water pipe trench Width of water pipe trench Depth of pipe bedding (water line) 2,000 ft 3 ft 1 ft	Assuming 3 - 1/0 wires from treatment facility to	6,30	0 ft				
Assumes the distance from the treatment facility to wal Depth of water pipe trench Width of water pipe trench Depth of pipe bedding (water line) 2,000 ft 5 ft 1 ft	electrical connection						
Depth of water pipe trench Width of water pipe trench Depth of pipe bedding (water line) 5 ft 3 ft 1 ft	19. Water connection for S/S processes						
Width of water pipe trench Depth of pipe bedding (water line) 3 ft 1 ft	Assumes the distance from the treatment facility to wat	2,00	0 ft				
Depth of pipe bedding (water line)	Depth of water pipe trench		5 ft				
	Width of water pipe trench		3 ft				
	Depth of pipe bedding (water line)		1 ft				
Depth of backful (water line)	Depth of backfill (water line)		4 ft				

^{20.} Assumes grubbed material will consist of native species that can be reincorporated into the site during backfill and restoration. Assumes the volume of grubbed material to have a neglible impact.

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Construction Management (2.5% of total capital	l Includes submittals, reporting, meetings over 12 month duration	LS	1	\$198,565.66	\$198,560
Treatability Study		LS	1	\$50,000.00	\$50,00
Institutional Controls		Each	1	\$5,700.00	\$5,70
Subtotal		•			\$254,26
Site Preparation				•	,
Surveying Crew	1-person crew @ \$100/hr., 8hr/day; assume 30% of project duration	Day	105	\$800.00	\$84,000
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	2,600	\$7.05	\$18,328
Site Services	NYSDEC Field Office 12 Month Duration	DAY	350	\$500.00	\$175,000
Clearing and Grubbing	Estimated surface area of TSCA excavation and treatment area, Includes inlet area to be restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	_	7,583		\$13,974
Construct Decontamination Pad & Containment	For equipment & personnel	Setups	2	\$7,000.00	\$14,000
Health and Safety					
Health and Safety	HSO, CAMP and Security Reporting	DAY	350	\$2,333.00	\$816,550
Subtotal	priso, or hir und security reporting	D111	350	Ψ 2 ,333.00	\$1,141,852
Excavation					. , ,
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr./day during 80% of soil stabilization and solidification	Day	279	\$3,193.35	\$892,052
PCB Wastewater Treatment during Remediation	n Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050 Fill and 3" Portable Trash Pump 300 GPM	LS	1	\$27,653.00	\$27,653
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent treatment zones.	BCY	1,873	\$15.00	\$28,098
TSCA Level PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276		\$177,606
Waste Characterization Sampling	As req'd to satisfy off-site Landfill Requirements for TSCA soil disposal	Each	3	\$206.00	\$618
Confirmation Sampling - EPA SW-846, Method	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with over 300 liner feet of perimeter for TSCA areas.	Each	73	\$125.16	\$9,136
Excavate Landfill Area for excess solidified PCB soil	stockpile clean soil and topsoil for cover 85' x 85' x 8' deep	CY	2,397	\$15.00	\$35,955
Subtotal					\$1,433,504
In Situ Stabilization and Solidification					
Soil Augering and Amendment	Assumes two Geo-Con Excavator Mounted Auger w/ pressure feed mobile Mixer, assume 5% increase in volume due to overlapping augering grid, includes fuel, electricity, water, maintenance, labor, mobilization and demobilization. Does not include site preparations.	CY	15,655	\$325.50	\$5,095,602
Post-cure testing for performance	TCLP testing to document solidification/ stabilization performance	LS	1	\$20,000.00	\$20,000
	1				

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					\$5,115,60
Utility Connections					
Electrical		I= .		** *** ***	*
Electric Utility Pole	Wooden pole, 40' high	Each	1	\$1,586.10	\$1,58
Wiring to Electric Service	3 - 1/0 Wires	CLF	63	\$468.28	\$29,50
Wiring Connections to treatment facility	200 amp w/ 18 branch breakers, includes main breaker, meter, socket, panel board, ground rod (20' avg runs, #14/2 wiring)	EA	4	\$2,844.91	\$11,38
Switchboard	1200 amp	EA	1	\$7,200.40	\$7,20
Transformer	Dry type transformer, 3 Phase, 500 kVA	EA	1	\$14,904.33	\$14,90
Electrical Connection Fee		LS	1	\$2,900.00	\$2,90
Install Electrical Connections/Testing	0.25 Electrician Foreman, 1 electrician, 2 laborers	Day	5	\$1,675.33	\$8,37
Electric Meter	AC recording ammeter	Each	1	\$8,534.74	\$8,53
Water					
Trenching	4'-6' Deep, 1/2 CY excavator	BCY	1,111	\$9.01	\$10,01
Pipe	4" PVC	LF	2,000	\$8.61	\$17,22
Pipe Bedding	Sand	LCY	249	\$32.23	\$8,02
Compaction		BCY	1,111	\$5.29	\$5,87
Backfill	4'-6' Deep, 1/2 CY excavator	BCY	996	\$7.30	\$7,26
Water meter		Each	1	\$2,900.00	\$2,90
Water Service Connection	Assumes potable water connection at Lincoln Avenue	LS	1	\$5,000.00	\$5,00
Administrative Costs	Permitting for water utility connection	LS	1	\$5,000.00	\$5,00
Subtotal					\$145,68
Site Restoration		I		4.5	
Topsoil	0.5 ft thick over entire excavation area, swell at 12%	LCY	317	\$39.60	\$12,54
Restore Drainageway Invert	Includes 95% Compaction	CY	296	\$19.41	\$5,74
Erosion and Soil Control Blanket	Biodegradable blankets to temporarily stabilize invert and slopes until natural growth is established	SY	1,556	\$6.55	\$10,19
Medium Rip Rap	To armor invert near intersection with OU-2; Includes trucking and Installation	TON	24	\$75.50	\$1,81
Backfill Landfill Area	includes redistribution and compaction of clean soil for Cap	CY	2,397	\$19.41	\$46,52
Hydroseeding	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer	SY	1,775	\$1.48	\$2,62
Hydroseed Cap	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer	SY	802	\$1.48	\$1,18
Plantings	Sandbar Willow/Red Osier Dogwood/Northern Bayberry/Catskill Sand Cherry, in 40% of hydroseeded area	SY	710		\$11,24
Demobilization	, and the second	LS	1	\$10,000.00	\$10,00
Subtotal					\$101,87
Gate	Double swing gates, incl posts with 12' opening	Each	3	\$1,107.75	\$3,32
Signs	Reflectorized 24"x24" sign mounted to fence	Each	4	\$196.37	\$78
Subtotal					\$4,10
			Capital (Cost Subtotal:	\$8,196,89
	Adjusted Capital Cost Subtotal for	Albany, New			\$8,049,34
	10% Legal, administrative, en				\$804,93
15% Contingencies:					
				Capital Cost:	\$1,328,14 \$10,183,00

Item Description	Comment Unit Quantity Unit Cost	Cost			
Annual Costs					
Not Applicable	\$0.00	\$0			
Subtotal		\$0			
	Annual Cost Subtotal:	\$0			
	Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	\$0			
	10% Legal, administrative, engineering fees:	\$0			
	15% Contingencies:	\$0 \$0 \$0 \$0 \$0 \$0 \$0			
	Annual Cost Total:	\$0			
	30-Year Present Worth of Annual Costs:	\$0			
5-Year Costs (Periodic Costs)					
5-year CERCLA reviews	Hr 80 \$120.00				
Subtotal		\$9,600			
	5-Year Cost Subtotal:	\$9,600			
	Adjusted Annual Cost Subtotal for Albany, New York Location Factor (0.982):	\$9,427			
	10% Legal, administrative, engineering fees:				
	15% Contingencies:	\$1,555 \$11,925			
5-Year Tota					
30-Year Present Worth of 5-Year Costs					
	2014 Total Present Worth Cost:	\$10,217,000			

Key:

ALTA = American Land Title Association

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CLF = current limiting fuse

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

LCY = loose cubic yards

LF = linear foot

LS = lump sum

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

make (see desire	Item Description	Comment	U	nit	Quantity	Unit Cost	Cost
make (see desire	otes:						
10 10 10 10 10 10 10 10		a 2014 29th Ed.)	Index		Markup		
1			1/1/2014	100	none		
1			2013	99	101%		
Section 1978			2012	96	104%		
1908			2007	84	120%		
March 1988 1989			2006	80	125%		
1988 1988 1989			2002	64	157%		
Section 1985			2000	60	168%		
Would selection the PLKA contaminated soil volume for treatment 15.65 to Kr, based on NDLK shapefiles provided estimated 15K4 contaminated soil volume for 15K4 ELEPC December 2014 (15.85 to Kr, based on NDLK shapefiles provided estimated 15K4 contaminated soil volume for 15K4 ELEPC December 2014 (15.87 to Kr) with a contaminated soil volume for 15K4 ELEPC December 2014 (15.87 to Kr) with a contaminated soil volume for 15K4 contaminated soil			1989	46	218%		
18.55 BCV, besed on NSDEC shapefiles protocol continuated 2001 wolume for 18CA contaminated will wolume (PUSP > 19m) = 1000 testimated 18CA contaminated will wolume for 18C	ssumptions:						
Total cestimated to Mack Soul Outnow (PCRS >= 50 ppm) =	Soil Volumes						
Total extracted of solvers for TSCA contaminated soil volume for TSCA contaminated soil volume for TSCA contaminated soil volume, because cut-backs would overlap with adjacent treatment zones. Actual cut-backs would be excavated per OSHA guidelines. Tricke Aces TSCA recoverior mate =	a. Total estimated non-TSCA contaminated soil volume for treatment =			15,655	BCY, based on I	N\SDEC shapefile	s provided t
Table carecarded soil volume for eff-site disposal = 1,873 BCV belacis were estimated at 5% of total soil volume, because cut-backs would overlap with adjacent treatment access clearly and 15% of total soil volume, because cut-backs would overlap with adjacent treatment access the clear several at 5% of total soil volume, because cut-backs would several posses of total soil volume access and 15% of total soil volume access	b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) =			1,784	EEEPC Decemb	er 2014	
the class were estimated at 5% of total soil volume, because cut-backs would overlap with adjacent treatment zones. Actual cut-backs would be excavated per OSHA guidelines. Trace Area = 10.00 Section and reaction of 18CA excavation area— (8.717 SF, as obtained from EEEPC CAD department December Stimated 18CA excavation area— (8.717 SF, as obtained from EEEPC CAD department December of cut-estimated ut-back soil area— (1.967 SF) and obtained from EEEPC CAD department December of the estimated of 18CA excavation area— (1.967 SF) and obtained from EEEPC CAD department December of the estimated at 18CA excavation area— (1.967 SF) and obtained from EEEPC CAD department December of the estimated at 18CA excavation store and the RLEEPC 2014) and typical properies soil (wet sitty sand and gravel, from Hough, Basic Soils Engineering.1957), in-situ bulk density of site soil— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC CAD department December of the attracetization samples for Badfill— (1.967 SF) and obtained from EEEPC	c. Total estimated cut-back soil volume for TSCA contaminated soil volume=			89	BCY		
where Access and the	d. Total excavated soil volume for off-site disposal =			1,873	BCY		
Son-Tack President area	Cut-backs were estimated at 5% of total soil volume, because cut-backs would of	verlap with adjacent treatment zones. Actual cut-backs would be excavated per OSHA guidelines.					
setimental TSCA excavation area = 6,717 SP, as obtained from EEEPC CAD department December found estimated cut-back soil area = 3,250 SF (rotal estimated cut-back soil area = 11,967 SF) (rotal estimated soil area = 11,9	Surface Areas =						
Find estimated curl-back soil area = 11.967 SF contain excavated soil area = 19.00 lbs/cf situs soil swell factor assumed = 19.00 lbs/cf situs soil factor assumed = 19.00 lbs/cf situs soil factor assumed as a 19.00 lbs/cf situs soil factor assumed as	a. Non-TSCA treatment area =		56,276 SF, as o	btained	from EEEPC CA	D department Dec	ember 2014
Ford exeavated soil area = 11,967 SF seed on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet sitty sand and gravel, from Hough, Basic Soils Engineering, 1957), in-situ bulk density of site soils = 90.0 lbs/cf situ soil swell factor assumed = 7% situ soil swell factor assumed = 7% situ soil swell factor assumed = 7% solid descriptions from the RI (EEEPC 2014) and typical properies soil (wet sitty sand and gravel, from Hough, Basic Soils Engineering, 1957), in-situ bulk density of site soils = 90.0 lbs/cf situ soil swell factor assumed = 7% solid descriptions from the RI (EEEPC 2014) and typical properies soil (wet sitty sand and gravel, from Hough, Basic Soils Engineering, 1957), in-situ bulk density of site soils = 90.0 lbs/cf situ soil swell factor assumed = 7% solid descriptions from the RI (EEEPC 2014) and typical properies soil (wet slift) sand factor assumed as a site of sand factor assumed as a site of sand factor assumed as a site of sand factor as a site sate of sand factor as a site sate for soil tables as a site of site of bottom area. **A	b. Estimated TSCA excavation area =		8,717 SF, as o	btained	from EEEPC CA	D department Dec	ember 2014
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e Chemical Waste Management Facility (landfill) in Model City, Niagara County, New York requires PCB samples to be collected every 1,000 CY. mber of confirmatory samples in TSCA excavations = 73 proximate permitters of all TSCA excavations zones = 1,034.50 proximate permitters of all TSCA excavation zones = 70 proximate permitters of all TSCA excavation zones zones zone zone zone zone zone zone zone zone	In-situ soil swell factor assumed =		7%				
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mber of excavation zones =	Number of confirmatory samples in TSCA excavations =		73				
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349 days, or 11.0 months med duration of TSCA soil excavation = Mob/demob duration assumed to be = 60 days, or 2.0 months ssumed site grades would be increased due to the addition of binder materials for stabilization and as a result additional work would be required to regrade drainage way. ssumed topsoil would be required only in TSCA excavation area and that the concrete monolithic block resulting from stabilization would be utilized in future site development. Assumed duration of topsoil placement and placement and proposed in the concrete monolithic block resulting from stabilization would be utilized in future site development. 5 days							
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Assumed topsoil would be required only in TSCA excavation area and that the concrete monolithic block resulting from stabilization would be utilized in future site development. 5 days ompaction =		s for stabilization and as a result additional work would be required to regrade drainage way.					
Assumed duration of topsoil placement and ompaction = 5 days							
ompaction =			5 days				
	compaction =		3 ·				
y-,	. Assumed duration of inlet restoration =		15 days, or	ſ			
ssumed total duration of site work = 12.0 months	. Assumed total duration of site work =		350 days, or	ī	12.0	months	
resent value of costs assumes 5% annual interest	. Present value of costs assumes 5% annual interest						

rate.

Item Description	Comment		Unit	Quantity	Unit Cost	Cost
18. Electrical connection for S/S processes						
Assumes the distance from the treatment facility to elec		2,000 ft				
Electrical wiring assumes #10		3,000 ft				
Assuming 3 - 1/0 wires from treatment facility to		6,300 ft				
electrical connection						
19. Water connection for S/S processes						
Assumes the distance from the treatment facility to wat		2,000 ft				
Depth of water pipe trench		5 ft				
Width of water pipe trench		3 ft				
Depth of pipe bedding (water line)		1 ft				
Depth of backfill (water line)		4 ft				

^{20.} Assumes grubbed material will consist of native species that can be reincorporated into the site during backfill and restoration. Assumes the volume of grubbed material to have a neglible impact.

Item Description	on and Off-Site Disposal, Alternative 6, Part 375 Restricted-Industrial SCOs Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs			•		
Construction Management (2.5% of total capital cost)	Includes submittals, reporting, meetings over 90 day duration	LS	1	\$80,474.05	\$80,474
Subtotal					\$80,474
Site Preparation					
Mobilization		LS	1	\$10,000.00	\$10,000
Surveying Crew	1-person crew @ \$100/hr, 8hr/day; assume 30% of project duration	Day	27	\$800.00	\$21,600
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	2,600	\$7.05	\$18,328
Site Services	NYSDEC Field Office 90 Day Duration	DAY	90	\$500.00	\$45,000
Construct Decontamination Pad & Containment	For Haz trucks exiting exclusion zone	EA	1	\$7,000.00	\$7,000
Clearing and Grubbing	Estimated surface area of excavations per Figure 1-1. Cutbacks assumed to add 5%. Includes inlet area to be restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	SY	4,601	\$1.84	\$8,478
Subtotal					\$130,407
Health and Safety				•	,
Health and Safety	HSO, CAMP and Security Reporting	DAY	90	\$958.33	\$86,250
Subtotal					\$86,250
Excavation					
Sheet Piling, Drive, Extract & Salvage	15' Deep excavation (max)	ton	248	\$2,039.27	\$504,721
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	BCY	1,873	\$15.00	\$28,098
PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276	\$78.04	\$177,606
Excavation - Non-TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	ВСҮ	9,106	\$15.00	\$136,584
PCB Contaminated Soil Disposal	Non-TSCA soils-bulk disposal	TON	11,063	\$34.69	\$383,784
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	11,063	\$78.04	\$863,339
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr/day	Day	45	\$3,193.35	\$145,071
PCB Wastewater Treatment during Remediation of Drainageway Sediments	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050 Fill and 3" Portable Trash Pump 300 GPM	LS	1	\$27,653.00	\$27,653
Waste Characterization Sampling	As req'd to satisfy off-site Landfill Requirements	Each	12	\$208.33	\$2,500
Confirmation/Documentation Sampling - EPA SW-846, Method SW-8082	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with over 300 liner feet of perimeter.	Each	517	\$208.33	\$107,708

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					\$2,639,44
Reconstruction					
Backfill	common earth, 3/4 CY bucket, front-end loader, includes borrow, loading, and spreading and materials. Includes	BCY	10,979	\$18.73	\$205,64
	excavations and inlet areas.				
Backfill, transportation to site only	Assumes 10 mile haul	LCY	12,296	\$5.99	\$73,678
Compaction	Vibrating roller, 6" lifts, 2 passes	ECY	10,979	\$1.06	\$11,60
Erosion and Soil Control Blankets	Biodegradable to temporarily stabilize stream channel/invert until natural growth is established. Only provided in inlet	SY	1,667	\$6.60	\$10,99
	area.				
Rough Grading of Drainageway Invert	Assumes as 20 foot by 50 foot invert area	EA	1	\$1,325.00	\$1,325
Medium Rip Rap	To armor invert near intersection with OU-2; Includes machine placement for slope protection.	BCY	37	\$65.96	\$2,443
Medium Rip Rap, transportation to site only	Assumes a 10 mile haul	LCY	37	\$5.99	\$222
Subtotal				12.7.	\$305,916
Site Restoration					
Topsoil	0.5 ft thick over entire excavation area, swell at 12%	LCY	637	\$39.88	\$25,406
Hydroseeding	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer for total topsoil area. Includes excavations and inlet areas.	SY	4,601	\$1.49	\$6,857
Plantings	Sandbar Willow/Red Osier Dogwood/Northern Bayberry/Catskill Sand Cherry - 20% of hydroseeded area	SY	920	\$15.95	\$14,677
Demobilization		LS	1	\$10,000.00	\$10,000
Subtotal					\$56,940
			Capi	tal Cost Subtotal:	\$3,299,436
	Adjusted Capital Cost Subtotal fo	r Albany, N	ew York Location	on Factor (0.982):	\$3,240,046
		10% Legal,		engineering fees:	\$324,00
				% Contingencies:	\$534,608
			To	tal Capital Cost:	\$4,099,000
Annual Costs				***	
Not Applicable				\$0.00	\$(
Subtotal			Λ	ol Cook Cultivity	\$(
	Adjusted Capital Cost Subtotal fo	r Albanı Ni		ual Cost Subtotal:	\$(
	· · · · · · · · · · · · · · · · · · ·			engineering fees:	\$0 \$0 \$0
		10 /0 Leyal,		% Contingencies:	\$(
				nual Cost Total:	\$0
		F		of Annual Costs	\$(

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
5-Year Costs (Periodic Costs)			-		
5-year CERCLA reviews		Hr	80	\$120.00	\$9,600
Subtotal					\$9,600
				ear Cost Subtotal:	\$9,600
	Adjusted Annual Cost Subtotal for				\$9,427
		10% Legal,		engineering fees:	\$943
			15	% Contingencies:	\$1,555
				5-Year Total:	\$11,925
		30-Year F	Present Worth	of 5-Year Costs:	\$34,000
		2	014 Total Pres	ent Worth Cost:	\$4,133,000

Key:

ALTA = American Land Title Association

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

LCY = loose cubic yards

LF = linear foot

LS = lump sum

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

Table 3-5 Revised Cost Estimate for Excavation and Off-Site Disposal, Alternative 6, Part 375 Restricted-Industrial SCOs

Item Description	Comment	U	nit	Quantity	Unit Cost	Cost
<u>Notes:</u> Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Index	2	014 Markup		
instorted Cost fidex (as obtained from RSMeans Facilities Constitution Cost Data 2014 27th Ed.)		1/1/2014	100	none		
		2013	99	101%		
		2012	96	104%		
		2010	91	110%		
		2007	84	120%		
		2006	80	125%		
		2002	64	157%		
Assumptions:						
. Excavation volumes						
a. Total estimated non-TSCA contaminated soil volume =			8,672 B	CY, based on N	N\SDEC shapefiles pr	ovided to EEEP
b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) =			1,784 D	ecember 2014		
c. Total estimated cut-back soil volumes=			523 B	CY		
d. Total excavated soil volume =			10,979 B	CY		
Cut-backs were estimated at 5% of total soil volume, because cut-backs would overlap with excavation zones.	Actual cut-backs would be excavated per OSHA guidelines.					
. Total excavation area =						
a. Non-TSCA excavation area =		30,716 SF, as	obtained	from EEEPC C	CAD department Dece	ember 2014
b. Total estimated TSCA excavation area =		8,717 SF, as	obtained	from EEEPC C	CAD department Dece	ember 2014
c. Total estimated cut-back soil area =		1,972 SF				
d. Total excavated soil area =		41,405 SF				
. Based on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet silty sand and gravel, fi	from Hough, Basic Soils Engineering.1957), in-situ bulk density of site soils =		90.0 lb	os/cf		
. In-situ soil swell factor assumed =		7%				
. Number of characterization samples for landfill =		12				
The Chemical Waste Management Facility (landfill) in Model City, Niagara County, New York requires PCB s	samples to be collected every 1,000 CY.					
. Number of confirmatory samples =		517				
Approximate perimeters of all non-TSCA excavation zones =		6,046.00 FT				
Approximate perimeters of all TSCA excavation zones =		1,034.50 FT				
Number of excavation zones =		10				
Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation and Refor every 900 SF of bottom area.	mediation May 2010 DER-10 Page 156 of 226: 1 surface sidewall and 1 subsurface side	ewall sample for every 30	linear fee	et of perimeter a	and 1 bottom sample	
Maximum excavation depth =		10 ft BG	S			
Assumed production rate of excavation =		130 BCY/	hr			
		75% assun	ned effecti	ve production r	rate	
		98 BCY/	hr, effecti	ve production r	rate	
				tive production		
. Assuming effective production rate, time to excavate soil =		14 days,	or	1.0 n	nonths	
0. For loose soil assume sandy, dry soil with swell factor =		12%				
(Means Estimating Handbook. United States of America: Means Southern Construction Information Netwo	rk, 1990).					
1. Backfill volume for site restoration =		10,979 BCY,	or			
		12,296 LCY				
2. Topsoil density assumed to be =		1.2 Tons/	LCY			
3. Topsoil volume for site restoration (0.5ft thick) =		569 BCY,	or			
		637 LCY				
4. Assumed production rate of backfill =		550 BCY/	day			
550 LCY/day for backfill per RSMeans Site Work & Landscape Cost Data 2013 31.23.23.15.4050 (Crew B-	-10R) includes 1 equp. Operator, 0.5 labor, and 1 front end loader, 1 CY bucket					
		75% assun	ned effecti	ve production r	rate	
		413 BCY/	day, effec	tive production	rate	
5. Assuming effective production rate, time to backfill soil =		31 days,			nonths	

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29. Assumes grubbed material will be included in non-TSCA soil disposal, which will have a negligible impact on disposal costs.

Item Description	Comment	Unit	Quantity	Unit Cost	Cost	
16. Assumed production rate of compaction =		2,600 ECY/day				
2600 ECY/day for compaction per RSMeans Site Work & Landscape Cost Data, 32nd Edition, 3	1.23.23.23.6200					
		75% assumed effective production rate				
		1,950 BCY/day, ef	fective production	rate		
17. Assuming effective production rate, time to compact soil =		7 days, or	1.0 r	nonths		
18. Assumedd area of inlet restoration		15,000 SF				
length =		300 ft				
width =		50 ft				
19. Assumed volume of rip-rap						
length =		50 ft				
width =		20 ft				
area =		1,000 SF				
Assumed height of rip-rap =		1.0 ft				
Volume =		37 LCY				
20. Assumed duration of inlet restoration =		15 days, or	1.0 r	nonths		
21. Mob/demob assumed to be =		20 days, or	1.0 r	nonths		
22. Assumed length of perimeter fence =		2,600 LF, as obtain	ed from EEEPC	CAD department Dece	ember 2014	
23. Assumed total duration of site work =		90 days, or	3.0 r	nonths		
24. Present value of costs assumes 5% annual interest rate.						
25. Local sales tax for soil disposal		6% Per WasteMa	anagement quote	from September 3, 201	13	
26. Soil transport fuel surcharge				from September 3, 201		
27. New York sales tax for disposal services		8% Per WasteMa	anagement quote	from September 3, 201	13	
28. Sheetpiling						
Maximum excavation depth (basis for sheetwall selection) =		15 ft BGS				
Length of sheet piling anticipated =		1,500 ft				
Area of sheet piling =		22,500 SF				
Weight of sheet piling =		22 psf				
Total Weight Needed =		248 Ton				

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Item Description	and Off-Site Disposal, Alternative 7, Part 375 Unrestricted SCOs Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Construction Management (2.5% of total capital cost)	Includes submittals, reporting, meetings over 190 day duration	LS	1	\$187,121.28	\$187,121
Subtotal					\$187,121
Site Preparation					
Mobilization		LS	1	\$10,000.00	\$10,000
Surveying Crew	1-person crew @ \$100/hr, 8hr/day; assume 30% of project duration	Day	57	\$800.00	\$45,600
ALTA Survey	For Easement and DEC Compliance	LS	1	\$20,000.00	\$20,000
Install Construction Fence	Chain link fence rental, 6' high, encompass Exclusion Zone	LF	2,600	\$7.05	\$18,328
Site Services	NYSDEC Field Office 190 Day Duration	DAY	190	\$500.00	\$95,000
Construct Decontamination Pad & Containment	For Haz trucks exiting exclusion zone	EA	1	\$7,000.00	\$7,000
Clearing and Grubbing	Estimated surface area of excavations per Figure 1-1. Cutbacks assumed to add 5%. Includes inlet area to be restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	SY	14,681	\$1.84	\$27,055
Subtotal					\$222,983
Health and Safety		I=	100	# 050.00	****
Health and Safety	HSO, CAMP and Security Reporting	DAY	190	\$958.33	\$182,083
Subtotal					\$182,083
Excavation					
Sheet Piling, Drive, Extract & Salvage	15' Deep excavation (max)	ton	248	\$2,039.27	\$504,721
Excavation - TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	BCY	1,873	\$15.00	\$28,098
PCB Contaminated Soil Disposal	TSCA soils-bulk disposal Subtitle C Facility	TON	2,276	\$115.29	\$262,386
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	2,276	\$78.04	\$177,606
Excavation - Non-TSCA Soil	Per FS Addendum Figure 1-1. Cutback volume assumed to add 5%. Most cut-backs would overlap adjacent excavation zones.	BCY	29,607	\$15.00	\$444,103
PCB Contaminated Soil Disposal	Non-TSCA soils-bulk disposal	TON	35,972	\$34.69	\$1,247,875
Transport Fee	Includes fee for transportation and 40% fuel surcharge for roundtrip haul from Albany NY to Model City & Return	TON	35,972	\$78.04	\$2,807,145
Dewatering	Methodology to be determined by Contractor; unit cost presumed as 2-4" pumps operating 24 hr/day	Day	132	\$3,193.35	\$420,631
PCB Wastewater Treatment during Remediation of Drainageway Sediments	Incl. 2,280 GPD Packaged WWTP, 40,000 Gal Baker Tank for Surge Capacity, 50 GPM Carbon Adsorption Tank 1,050 Fill and 3" Portable Trash Pump 300 GPM	LS	1	\$27,653.00	\$27,653
Waste Characterization Sampling	As req'd to satisfy off-site Landfill Requirements	Each	34	\$208.33	\$7,083
Confirmation/Documentation Sampling - EPA SW-846, Method SW-8082	Frequency per Final Technical Guidance for Site Investigation and Remediation May 2010 DER-10 for excavations with over 300 liner feet of perimeter.	Each	613	\$208.33	\$127,708

Item Description	on and Off-Site Disposal, Alternative 7, Part 375 Unrestricted SCOs Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					\$6,055,009
Reconstruction					
Backfill	common earth, 3/4 CY bucket, front-end loader, includes borrow, loading, and spreading and materials. Includes	BCY	31,480	\$18.73	\$589,657
	excavations and inlet areas.				
Backfill, transportation to site only	Assumes 10 mile haul	LCY	35,258	\$5.99	\$211,262
Compaction	Vibrating roller, 6" lifts, 2 passes	ECY	31,480	\$1.06	\$33,287
Erosion and Soil Control Blankets	Biodegradable to temporarily stabilize stream channel/invert until natural growth is established. Only provided in inlet	SY	1,667	\$6.60	\$10,994
	area.				
Rough Grading of Drainageway Invert	Assumes as 20 foot by 50 foot invert area	EA	1	\$1,325.00	\$1,325
Medium Rip Rap	To armor invert near intersection with OU-2; Includes machine placement for slope protection.	BCY	37	\$65.96	\$2,443
Medium Rip Rap, transportation to site only	Assumes a 10 mile haul	LCY	37	\$5.99	\$222
Subtotal					\$849,189
Site Restoration					
Topsoil	0.5 ft thick over entire excavation area, swell at 12%	LCY	2,429	\$39.88	\$96,870
Hydroseeding	Native Steep Slope Mix with Annual Rye Grass mix incl. mulch and fertilizer for total topsoil area. Includes excavations and inlet areas.	SY	14,681	\$1.49	\$21,881
Plantings	Sandbar Willow/Red Osier Dogwood/Northern Bayberry/Catskill Sand Cherry - 20% of hydroseeded area	SY	2,936	\$15.95	\$46,836
Demobilization		LS	1	\$10,000.00	\$10,000
Subtotal					\$175,587
				tal Cost Subtotal:	\$7,671,972
	Adjusted Capital Cost Subtotal fo				\$7,533,877
		10% Legal,		engineering fees:	\$753,388
				% Contingencies:	\$1,243,090
Annual Costs			То	tal Capital Cost:	\$9,531,000
Not Applicable				\$0.00	\$0
Subtotal				ψ0.00	\$0
			Annı	ual Cost Subtotal:	\$0
	Adjusted Capital Cost Subtotal fo	r Albany, N			\$0
				engineering fees:	\$0
				% Contingencies:	\$0 \$0 \$0
				nual Cost Total:	\$0
		F	Present Worth	of Annual Costs	\$0

Item Description	Comment	Unit	Quantity	Unit Cost	Cost	
5-Year Costs (Periodic Costs)						
Not Applicable		Hr	0	\$120.00	\$0 \$0	
Subtotal						
			5-Ye	ear Cost Subtotal:	\$0	
	Adjusted Annual Cost Subtotal f				\$0	
		10% Legal,		engineering fees:	\$0	
			15'	% Contingencies:	\$0	
				5-Year Total:	\$0	
30-Year Present Worth of 5-Year Costs:						
		2	014 Total Pres	ent Worth Cost:	\$9,531,000	

Key:

ALTA = American Land Title Association

BGS = below ground surface

CAMP = Community Air Monitoring Program

CF = cubic feet

CY = Cubic Yard

DEC = (New York State) Department of Environmental Conservation

EA = each

EPA = Environmental Protection Agency

EZ = exclusion zone

ft = feet

Gal = gallons

GPD = gallons per day

GPM = gallons per minute

H = height

HP = horsepower

Hr = hour

HSO = Health and Safety Officer

LCY = loose cubic yards

LF = linear foot

LS = lump sum

MSF = thousand square feet

NY = New York

OU = operable unit

PCB = Poly chlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

SF = square feet

SW = solid waste

SY = square yard

TSCA = Toxic Substances Control Act

W = width

Item Description	Comment		Jnit	Quantity	Unit Cost	Cost
Notes:		T 1	2	01434 1		
listorical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Inde		014 Markup		
		1/1/2014 2013	100 99	none 101%		
		2013	99 96	101%		
		2012	90	110%		
		2010	84	120%		
		2007	80	125%		
		2002	64	157%		
		2002	04	13770		
sumptions:						
Excavation volumes						
a. Total estimated non-TSCA contaminated soil volume =		28,197 BCY, based on N\SDEC shapefiles				
b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) =				December 2014		
c. Total estimated cut-back soil volumes=			1,499 E	BCY		
d. Total excavated soil volume =			31,480 E	BCY		
Cut-backs were estimated at 5% of total soil volume, because cut-backs would overlap with excavation a	zones. Actual cut-backs would be excavated per OSHA guidelines.					
Total excavation area =						
a. Non-TSCA excavation area =					CAD department Deco	
b. Total estimated TSCA excavation area =		8,717 SF, as obtained from EEEPC CAD department Decemb				
c. Total estimated cut-back soil area =		6,292 SF				
d. Total excavated soil area =		132,126 SF				
. Based on soil descriptions from the RI (EEEPC 2014) and typical properies soil (wet silty sand and gra	avel, from Hough, Basic Soils Engineering.1957), in-situ bulk density of site soils =		90.0 1	bs/cf		
In-situ soil swell factor assumed =		7%				
Number of characterization samples for landfill =		34				
The Chemical Waste Management Facility (landfill) in Model City, Niagara County, New York requires	s PCB samples to be collected every 1,000 CY.					
Number of confirmatory samples =		613				
Approximate perimeters of all non-TSCA excavation zones =		6,046.00 FT				
Approximate perimeters of all TSCA excavation zones =		1,034.50 FT				
Number of excavation zones =		28				
Assume confirmation sampling side-wall sampling per Final Technical Guidance for Site Investigation a for every 900 SF of bottom area.	and Remediation May 2010 DER-10 Page 156 of 226: 1 surface sidewall and 1 subsurface sidew	all sample for every 3	0 linear fe	et of perimeter a	and 1 bottom sample	
Maximum excavation depth =		10 ft B0	GS			
Assumed production rate of excavation =		130 BCY	//hr			
		75% assu	med effect	ive production 1	rate	
		98 BCY	/hr, effect	ive production 1	rate	
		780 BCY	//day, effec	ctive production	rate	
Assuming effective production rate, time to excavate soil =		40 days	, or	2.0 r	months	
For loose soil assume sandy, dry soil with swell factor =		12%				
(Means Estimating Handbook. United States of America: Means Southern Construction Information	Network, 1990).					
Backfill volume for site restoration =		31,480 BCY	, or			
		35,258 LCY	•			
. Topsoil density assumed to be =		1.2 Tons	s/LCY			
. Topsoil volume for site restoration (0.5ft thick) =		2,169 BCY	, or			
		2,429 LCY	•			
. Assumed production rate of backfill =		550 BCY	//day			
550 LCY/day for backfill per RSMeans Site Work & Landscape Cost Data 2013 31.23.23.15.4050 (C	Crew B-10R) includes 1 equp. Operator, 0.5 labor, and 1 front end loader, 1 CY bucket					
		75% assu	med effect	ive production i	rate	
				ctive production		
5. Assuming effective production rate, time to backfill soil =		91 days			nonths	

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29. Assumes grubbed material will be included in non-TSCA soil disposal, which will have a negligible impact on disposal costs.

Item Description	Comment	Unit	Quantity	Unit Cost	Cos	
Assumed production rate of compaction =		2,600 ECY/day				
2600 ECY/day for compaction per RSMeans Site Work & Landscape Cost Data, 32nd Edition, 31.	23.23.23.6200					
		75% assumed effective production rate				
		1,950 BCY/day, effective production rate				
Assuming effective production rate, time to compact soil =		19 days, or	1.0	months		
Assumedd area of inlet restoration		1,667 SY				
ength =		300 ft				
vidth =		50 ft				
Assumed volume of rip-rap						
length =		50 ft				
width =		20 ft				
area =		1,000 SF				
Assumed height of rip-rap =		1.0 ft				
Volume =		37 LCY				
Assumed duration of inlet restoration =		15 days, or	1.0	months		
Mob/demob assumed to be =		20 days, or	1.0	months		
Assumed length of perimeter fence =		2,600 LF, as obtained from EEEPC CAD department De				
Assumed total duration of site work =		190 days, or	6.0	months		
Present value of costs assumes 5% annual interest rate.						
Local sales tax for soil disposal	6% Per WasteManagement quote from September 3, 2013					
Soil transport fuel surcharge		40% Per WasteManagement quote from September 3				
New York sales tax for disposal services		8% Per WasteManagement quote from September 3, 2013				
Sheetpiling						
Maximum excavation depth (basis for sheetwall selection) =		15 ft BGS				
Length of sheet piling anticipated =		1,500 ft				
Area of sheet piling =		22,500 SF				
Weight of sheet piling =	22 psf					
Total Weight Needed =		248 Ton				

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Table 3-7 Revised Summary of Total Present Value Costs of Remedial Alternatives at Adirondack Steel OU-3

	Alternative 1	Alternative 2	Alternative 3 Alternative 4 Alternative 5		ative 5	Alternative 6	Alternative 7			
									Excavation and	Excavation and
			Excavation and Off-Site Disposal ^{1,2}		Excavation and On-Site Treatment by HTTD ^{1,2}				Off-Site	Off-Site
		No Further					In-Situ Solidification 1,2		Disposal ⁹	Disposal ¹⁰
		Action with	PART 375		PART 375		PART 375		PART 375	PART 375
		Site	Commercial	CP-51	Commercial	CP-51	Commercial	CP-51	Industrial PCB	Unrestricted
Description	No Action	Management	PCB SCOs	PCB SCOs	PCB SCOs	PCB SCOs	PCB SCOs	PCB SCOs	SCOs	PCB SCOs
Estimated Total Project Duration ³	0	30 Years	6 Months	4 Months	8 Months	7 Months	20 Months	12 Months	3 Months	6 Months
Capital Cost	\$0	\$9,000	\$9,309,000	\$6,021,000	\$10,767,000	\$7,176,000	\$17,093,000	\$10,183,000	\$4,099,000	\$9,531,000
Annual O&M ^{4,5}	\$0	\$118,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Periodic O&M ^{4,6,8}	\$0	\$77,000	\$34,000	\$34,000	\$34,000	\$34,000	\$34,000	\$34,000	\$34,000	\$0
2014 Total Present Value ⁷	\$0	\$204,000	\$9,343,000	\$6,055,000	\$10,801,000	\$7,210,000	\$17,127,000	\$10,217,000	\$4,133,000	\$9,531,000

Kev:

HTTD = High-temperature thermal desorption
NYCRR = New York Code of Rules and Regulations
O& M = Operations and Maintenance
OU = Operable Unit

PCB = Polychlorinated biphenyl ppm = part per million

SCO = Soil Cleanup Objective

Notes:

- 1 Soil Cleanup Objective for PCB's under 6 NY CRR Part 375-Restricted Use-Commercial Table 375-6.8 (b) is 1 ppm in surface and subsurface soils.
- 2 Soil Cleanup Objective for PCB's under NYSDEC CP-51 Restricted Use is 1 ppm in surface (0-1 feet below ground surface) and 10 ppm subsurface soils.
- 3 Durations based on Engineers Estimate of NYSDEC Div. of Environmental Remediation Construction Observation Projects through Substantial Completion
- 4 Project duration after installation of engineering control includes 30 years of OM&M and periodic costs
- 5 Annual costs would typically include groundwater monitoring and reporting.
- $6-Periodic\ costs\ would\ typically\ include\ maintaining/updating\ institutional\ controls\ and\ partial\ fence\ replacement.$
- 7 The Total Present Value of Alternative represents the estimated present value of the capital costs and 30 years of annual and periodic costs.
- 8 Under CERCLA 121 (c) five-year reviews should be conducted for sites that implement remedial actions that, upon completion, would leave hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure.
- 9 Soil Cleanup Objective for PCB's under 6 NY CRR Part 375-Restricted Use-Industrial Table 375-6.8 (b) is 25 ppm in surface and subsurface soils.
- 10 Soil Cleanup Objective for PCB's under 6 NYCRR Part 375-Unrestricted Use Table 375-6.8 (a) is 0.1 ppm in surface and subsurface soils.

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References

