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
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List 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

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.

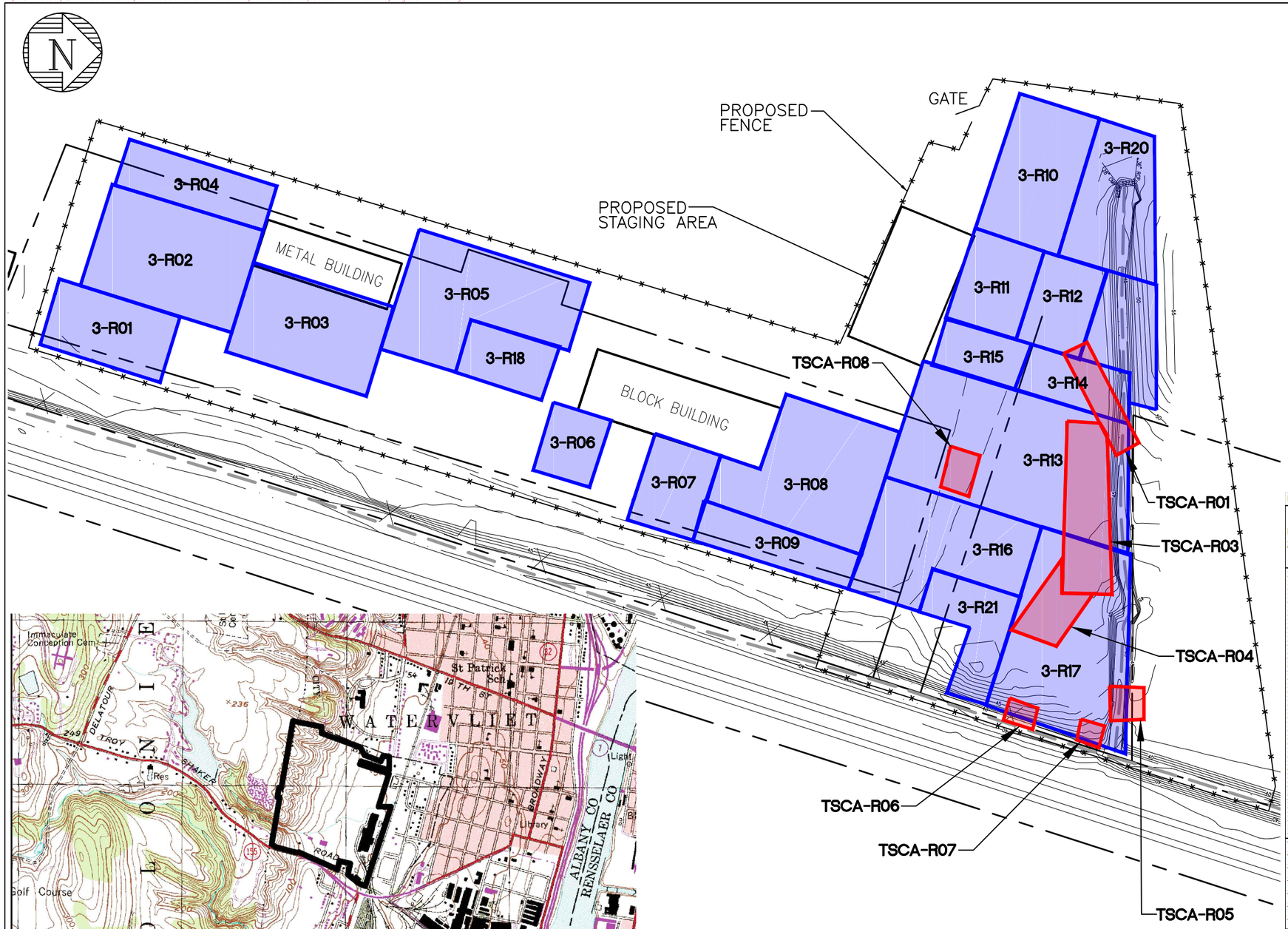
2.3 Determination of Excavation and Treatment Volumes

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 drainageway 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.

F:/ADK Steel/Excavation sample locations and volumes/November Updated Alternatives/Figure 1-1.dwg

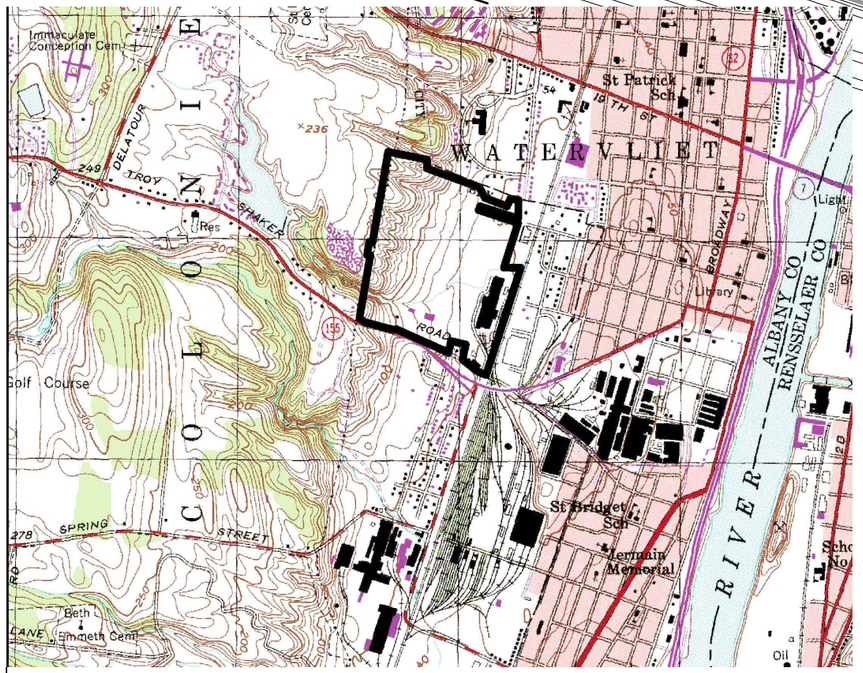


LEGEND

- EXISTING TOPOGRAPHIC CONTOUR
- PROPERTY LINE
- PROFILE
- EXCAVATION/TREATMENT BOUNDARY FOR PCB-CONTAMINATED SOILS (SEE TABLE FOR EXCAVATION DEPTHS)
- EXCAVATION BOUNDARY FOR PCB-CONTAMINATED SOILS (TSCA) (SEE TABLE FOR EXCAVATION DEPTHS)

Estimated Excavation/Treatment (Feet) Depths

Excavation Zone	Unrestricted (>=0.1 ppm PCBs)	PT 375 restricted-commercial (>= 1ppm PCBs)	CP-51 (>= 1ppm/10ppm PCBs surface/subsurface)	PT 375 restricted-industrial (>= 25 ppm PCBs)
3-R01	10	10	10	8
3-R02	5	5	-	-
3-R03	5	5	-	-
3-R04	3	-	-	-
3-R05	4	4	-	-
3-R06	2	-	-	-
3-R07	10	10	-	-
3-R08	2 to 8 ft bgs	2 to 8 ft bgs	-	-
3-R09	10	10	-	-
3-R10	5	5	-	-
3-R11	4	4	4	-
3-R12	10	10	10	-
3-R13	10	10	10	8
3-R14	10	10	10	-
3-R15	3	3	-	-
3-R16	4	4	2	-
3-R17	10	10	10	7
3-R18	6	6	6	-
3-R19	6	6	-	-
3-R20	4	4	2	-
3-R21	2	2	-	-
TSCA-R01	6	6	6	6
TSCA-R03	6	6	6	6
TSCA-R04	6	6	6	6
TSCA-R05	6	6	6	6
TSCA-R06	3	3	3	3
TSCA-R07	4	4	4	4
TSCA-R08	2	2	2	2



Source: USGS Troy South 7.5 Minute Quadrangle

Adirondack Steel Site

SITE LOCATION
NOT TO SCALE

SCALE IN FEET
0 80 160 240

ecology and environment engineering p.c.

FIGURE 1-1: EXCAVATION AND TREATMENT EXTENTS, ADIRONDACK STEEL OU-3
FORMER ADIRONDACK STEEL SITE
COLONIE, NEW YORK

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, off-site.

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-

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 Cost Subtotal:	$6,785
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$6,663
				10% Legal, administrative, engineering fees, construction management:	$666
				15% Contingencies:	$1,099
				Total 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
				Annual Cost Subtotal:	$6,136
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$6,026
				10% Legal, administrative, engineering fees:	$603
				15% Contingencies:	$994
				Annual Cost Total:	**$7,622**
				30-Year Present Worth of Annual 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 strands barb wire	LF	166	$30.21	$5,000
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
				5-Year Cost Subtotal:	$22,100
				Adjusted Annual Cost Subtotal for Albany, New York Location Factor (0.982):	$21,702
				10% Legal, administrative, engineering fees:	$2,170
				15% Contingencies:	$3,581
				5-Year Total:	**$27,453**
				30-Year Present Worth of 5-Year Costs:	**$77,000**
				2014 Total Present Worth Cost:	**$204,000**

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

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

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
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 restored where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	SY	13,995	$1.84	$25,791
Subtotal					$214,320
Health and Safety					
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.	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	29,005	$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

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

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					$5,923,011
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					$833,230
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
				Capital Cost Subtotal:	$7,493,341
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$7,358,461
				10% Legal, administrative, engineering fees:	$735,846
				15% Contingencies:	$1,214,146
				Total Capital Cost:	**$9,309,000**
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
				Annual Cost Total:	**$0**
				Present Worth of Annual Costs	**$0**

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

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
				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:	$943
				15% Contingencies:	$1,555
				5-Year Total:	**$11,925**
				30-Year Present Worth of 5-Year Costs:	**$34,000**
				2014 Total Present 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	Comment	Unit	Quantity	Unit Cost	Cost
Notes:					
Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Index	2014 Markup		
		1/1/2014	100	none	
		2013	99	101%	
		2012	96	104%	
		2010	91	110%	
		2007	84	120%	
		2006	80	125%	
		2002	64	157%	
Assumptions:					
1. 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 excavated per OSHA guidelines.					
2. Total excavation area =					
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		
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/cf	
4. In-situ soil swell factor assumed =		7%			
5. 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.					
6. 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 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 900 SF of bottom area.					
7. Maximum excavation depth =		10	ft BGS		
8. 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		
9. Assuming effective production rate, time to excavate soil =		40	days, or	2.0	months
10. For loose soil assume sandy, dry soil with swell factor =		12%			
(Means Estimating Handbook. United States of America : Means Southern Construction Information Network, 1990).					
11. Backfill volume for site restoration =		30,878	BCY, or		
		34,583	LCY		
12. Topsoil density assumed to be =		1.2	Tons/LCY		
13. Topsoil volume for site restoration (0.5ft thick) =		2,060	BCY, or		
		2,307	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					
		75%	assumed effective production rate		
		413	BCY/day, effective production rate		
15. Assuming effective production rate, time to backfill soil =		80	days, or	3.0	months

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

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, 31.23.23.23.6200					
		75% assumed effective production rate			
		1,950 BCY/day, effective production rate			
17. Assuming effective production rate, time to compact soil =		19 days, or	1.0 months		
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 months		
21. Mob/demob assumed to be =		20 days, or	1.0 months		
22. Assumed length of perimeter fence =		2,600 LF, as obtained from EEEPC CAD department December 2014			
23. Assumed total duration of site work =		180 days, or	6.0 months		
24. Present value of costs assumes 5% annual interest rate.					
25. Local sales tax for soil disposal		6% Per WasteManagement quote from September 3, 2013			
26. Soil transport fuel surcharge		40% Per WasteManagement quote from September 3, 2013			
27. New York sales tax for disposal services		8% Per WasteManagement quote from September 3, 2013			
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.					

Table 3-2b Revised Cost Estimate for Excavation and Off-Site Disposal, Alternative 3, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Construction Management (2.5% of total capital cost)	Includes submittals, reporting, meetings over 122 day duration	LS	1	$118,205.95	$118,206
Subtotal					$118,206
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	37	$800.00	$29,600
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 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 where the drainage ditch in OU-3 intersects the drainage ditch in OU-2.	SY	7,583	$1.84	$13,974
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

Table 3-2b Revised Cost Estimate for Excavation and Off-Site Disposal, Alternative 3, CP-51 SCOs

Item Description	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					$500,201
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
				Capital Cost Subtotal:	$4,846,444
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$4,759,208
				10% Legal, administrative, engineering fees:	$475,921
				15% Contingencies:	$785,269
				Total Capital Cost:	**$6,021,000**
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
				Annual Cost Total:	**$0**
				Present Worth of Annual Costs	**$0**

Table 3-2b Revised Cost Estimate for Excavation and Off-Site Disposal, Alternative 3, CP-51 SCOs

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
				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:	$943
				15% Contingencies:	$1,555
				5-Year Total:	**$11,925**
				30-Year Present Worth of 5-Year Costs:	**$34,000**
				2014 Total Present 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

Table 3-2b Revised Cost Estimate for Excavation and Off-Site Disposal, Alternative 3, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost

Notes:

Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)

	Index	2014 Markup
1/1/2014	100	none
2013	99	101%
2012	96	104%
2010	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\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= 872 BCY
   - d. Total excavated soil volume = 18,310 BCY

   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.
2. Total excavation area =
   - a. Non-TSCA excavation area = 56,276 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 = 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/cf
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 PCB 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 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 900 SF of bottom area.
7. Maximum excavation depth = 10 ft BGS
8. 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
9. Assuming effective production rate, time to excavate soil = 23 days, or 1.0 months
10. For loose soil assume sandy, dry soil with swell factor = 12%

    (Means Estimating Handbook. United States of America : Means Southern Construction Information Network, 1990).
11. Backfill volume for site restoration = 18,310 BCY, or

    20,508 LCY
12. Topsoil density assumed to be = 1.2 Tons/LCY
13. Topsoil volume for site restoration (0.5ft thick) = 1,042 BCY, or

    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

    75% assumed effective production rate

    413 BCY/day, effective production rate
15. Assuming effective production rate, time to backfill soil = 53 days, or 2.0 months

Table 3-2b Revised Cost Estimate for Excavation and Off-Site Disposal, Alternative 3, CP-51 SCOs

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, 31.23.23.23.6200						
		75%	assumed effective production rate			
		1,950	BCY/day, effective production rate			
17. Assuming effective production rate, time to compact soil =		11	days, or	1.0	months	
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	months	
21. Mob/demob assumed to be =		20	days, or	1.0	months	
22. Assumed length of perimeter fence =		2,600	LF, as obtained from EEEPC CAD department December 2014			
23. Assumed total duration of site work =		122	days, or	4.0	months	
24. Present value of costs assumes 5% annual interest rate.						
25. Local sales tax for soil disposal		6%	Per WasteManagement quote from September 3, 2013			
26. Soil transport fuel surcharge		40%	Per WasteManagement quote from September 3, 2013			
27. New York sales tax for disposal services		8%	Per WasteManagement quote from September 3, 2013			
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.						

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 cost)	Includes submittals, reporting, meetings over 230 day duration	LS	1	$211,257.90	$211,258
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 zones.	BCY	29,005	$15.00	$435,069
Stockpiling (prior to treatment)	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	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 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 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	Comment	Unit	Quantity	Unit Cost	Cost
Off-Site Disposal of Hazardous Soil (PCBs >= 50 ppm)					
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 of 840 tons/day.	Million Gallons	4	$3,930.00	$14,888
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 3-3a 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
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					$184,771
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					$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
				Capital Cost Subtotal:	$8,667,274
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$8,511,263
				10% Legal, administrative, engineering fees:	$851,126
				15% Contingencies:	$1,404,358
				Total Capital Cost:	**$10,767,000**
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
				Annual Cost Total:	**$0**
				30-Year 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
				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:	$943
				15% Contingencies:	$1,555
				5-Year Total:	**$11,925**
				30-Year Present Worth of 5-Year Costs:	**$34,000**
				2014 Total Present 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

Item Description	Comment	Unit	Quantity	Unit Cost	Cost

Notes:

Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)

	Index	2014 Markup
1/1/2014	100	none
2013	99	101%
2012	96	104%
2010	91	110%
2007	84	120%
2006	80	125%
2002	64	157%

Assumptions:

1. 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 excavated per OSHA guidelines.
2. Total excavation area =
   - 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
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/cf, or 1.2 Tons/BCY
4. In-situ soil swell factor assumed = 7%
5. 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.
6. 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 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 900 SF of bottom area.
7. Maximum excavation depth = 10 ft BGS
8. Basic production rate of HTTD system = 35 Tons/hr
   - 840 Tons/day
   - 75% assumed effective operating rate for maintenance and downtime
   - 630 Tons/day, effective production rate
   - 229,950 Tons/year, effective production rate
9. Volume of soil to be treated by HTTD unit = 29,005 BCY
10. Assuming effective production rate, time to treat excavated soil = 2 months, or 0.2 years, or
11. Mob/demob assumed to be = 4 months, or 0.3 years
12. Assume % of treated soil to be used as backfill = 100%
13. Assume % reduction by volume of soil from HTTD treatment process = 0%
14. 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
15. Topsoil volume for site restoration (0.5ft thick) = 161 BCY, or

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				
		75% assumed effective production rate			
		413 BCY/day, effective production rate			
17. Assuming effective production rate, time to backfill soil =		75 days, or	3.0 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 =		16 days, or	1.0 months		
20. Assume tree planting over 20% of hydroseeded area =		2,799 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 excavation is approximately		500 ft			
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 electrical connection		6,300 ft			
25. Natural gas connection for HTTD system					
Assumes the distance from the treatment facility to natural g		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 =		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).				
33. Topsoil density assumed to be =		1.2 Tons/LCY			
34. Fire protection for treatment facility not included in this estimate.					
35. This estimate assumes use of existing concrete foundation at the site can be used as a base for placement of treatment facility.					
36. Assumed length of perimeter fence =		2,600 LF, as obtained from EEEPC CAD department December 2014			

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
37. Assumed total duration of site work =		230 days, or	8.0 months		
38. Present value of costs assumes 5% annual interest rate.					
39. HTTD costs supplied by vendor, Environmental Soil Management, Inc. (ESMI), June 2007. Other unit costs listed were obtained from 2014 RS Means Cost Data and engineering judgement.					
40. Local sales tax for soil disposal		6%	Per WasteManagement quote from September 3, 2013		
41. Soil transport fuel surcharge		40%	Per WasteManagement quote from September 3, 2013		
42. New York sales tax for disposal services		8%	Per WasteManagement quote from 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			
44. 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.					

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 cost	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 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 zones.	BCY	16,437	$15.00	$246,559
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 ppm)					

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 cost	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 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 zones.	BCY	16,437	$15.00	$246,559
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 ppm)					
Waste Characterization Sampling	As req'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					$1,664,200
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	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 (effluent)	Includes TCL PCBs (Engineers Allowance for operational days)	Each	16	$208.33	$3,302
Subtotal					$2,975,748

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 of 840 tons/day.	Million Gal	2	$3,930.00	$8,437
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 Subtotal for Albany, New York Location Factor (0.982):	$9,427
				10% Legal, administrative, engineering fees:	$943
				15% Contingencies:	$1,555
				5-Year Total:	**$11,925**
				30-Year Present Worth of 5-Year Costs:	**$34,000**
				2014 Total Present 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
WWTP = waste water treatment plant

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

Notes:

Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)

	Index	2014 Markup
1/1/2014	100	none
2013	99	101%
2012	96	104%
2010	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\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= 872 BCY
   - d. Total excavated soil volume = 18,310 BCY

   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.
2. Total excavation area =
   - a. Non-TSCA excavation area = 56,276 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 = 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/cf, or 1.2 Tons/BCY
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 PCB 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 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 900 SF of bottom area.
7. Maximum excavation depth = 10 ft BGS
8. Basic production rate of HTTD system = 35 Tons/hr
   - 840 Tons/day
   - 75% assumed effective operating rate for maintenance and downtime
   - 630 Tons/day, effective production rate
   - 229,950 Tons/year, effective production rate
9. Volume of soil to be treated by HTTD unit = 16,437 BCY
10. Assuming effective production rate, time to treat excavated soil = 1 months, or 0.1 years, or
11. Mob/demob assumed to be = 4 months, or 0.3 years
12. Assume % of treated soil to be used as backfill = 100%
13. Assume % reduction by volume of soil from HTTD treatment process = 0%
14. Backfill volume for site restoration = 16,437 BCY, or Treated non-TSCA soils
    - 18,410 LCY
    - 1,873 BCY, or Imported soil equal to TSCA soil disposed of off-site
    - 2,098 LCY
15. Topsoil volume for site restoration (0.5ft thick) = 161 BCY, or

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
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				
		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 excavation is approximately		500	ft		
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 electrical connection		6,300	ft		
25. Natural gas connection for HTTD system					
Assumes the distance from the treatment facility to natural g		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).				
33. Topsoil density assumed to be =		1.2	Tons/LCY		
34. Fire protection for treatment facility not included in this estimate.					
35. This estimate assumes use of existing concrete foundation at the site can be used as a base for placement of treatment facility.					
36. Assumed length of perimeter fence =		2,600	LF, as obtained from EEEPC CAD department December 2014		

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 months		
38. Present value of costs assumes 5% annual interest rate.					
39. HTTD costs supplied by vendor, Environmental Soil Management, Inc. (ESMI), June 2007. Other unit costs listed were obtained from 2014 RS Means Cost Data and engineering judgement.					
40. Local sales tax for soil disposal		6%	Per WasteManagement quote from September 3, 2013		
41. Soil transport fuel surcharge		40%	Per WasteManagement quote from September 3, 2013		
42. New York sales tax for disposal services		8%	Per WasteManagement quote from 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			
44. 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.					

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 capital cost)	Includes submittals, reporting, meetings over 20 month duration	LS	1	$334,243.43	$334,243
Treatability Study		LS	1	$50,000.00	$50,000
Institutional Controls		Each	1	$5,700.00	$5,700
Subtotal					$389,943
Site Preparation					
Surveying Crew	1-person crew @ $100/hr., 8hr/day; assume 30% of project duration	Day	186	$800.00	$148,800
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 in OU-3 intersects the drainage ditch in OU-2.	SY	13,995	$1.84	$25,791
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	620	$2,333.00	$1,446,460
Subtotal					$1,983,380
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	493	$3,193.35	$1,574,083
PCB Wastewater Treatment during Remediation of Drainageway and Sediments until solidification and restoration are is complete	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	$78.04	$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 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 for TSCA areas.	Each	134	$125.16	$16,771
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					$2,123,170
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	27,623	$325.50	$8,991,519
Post-cure testing for performance	TCLP testing to document solidification/ stabilization performance	LS	1	$20,000.00	$20,000
Subtotal					$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)	EA	4	$2,844.91	$11,380

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					$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					$4,109
				Capital Cost Subtotal:	$13,759,681
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$13,512,007
				10% Legal, administrative, engineering fees, construction management:	$1,351,201
				15% Contingencies:	$2,229,481
				Total Capital Cost:	**$17,093,000**
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
				Annual Cost Total:	**$0**
				30-Year Present Worth of 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		Hr	80	$120.00	$9,600
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:	$943
				15% Contingencies:	$1,555
				5-Year Total:	**$11,925**
				30-Year Present Worth of 5-Year Costs:	**$34,000**
				2014 Total Present 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
WWTP = waste water treatment plant

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
Notes:					
Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Index	Markup		
		1/1/2014	100	none	
		2013	99	101%	
		2012	96	104%	
		2007	84	120%	
		2006	80	125%	
		2002	64	157%	
		2000	60	168%	
		1989	46	218%	
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 December 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 treatment zones. Actual cut-backs would be excavated per OSHA guidelines.					
2. Surface Areas =					
a. Non-TSCA treatment area =		111,240	SF, as obtained from EEEPC CAD department December 2014		
b. 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 =		14,715	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/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 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 900 SF of bottom area.					
7. Local sales tax for soil disposal		6%	Per WasteManagement quote from September 3, 2013		
8. Soil transport fuel surcharge		40%	Per WasteManagement quote from September 3, 2013		
9. New York sales tax for disposal services		8%	Per WasteManagement quote from September 3, 2013		
10. Average reported production rate of in situ stabilization/ solidification = 1,000 cubic yards per 1.1 Months (USEPA Solidification/Stabilization Use at Superfund Sites (EPA-542-R-00-010))					
		60	BCY/day		
		75%	assumed effective operating rate for maintenance and downtime		
		45	BCY/day, effective production rate		
		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 stabilization 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 monolithic 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	20.0	months
17. Present value of costs assumes 5% annual 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

Item Description	Comment		Unit	Quantity	Unit Cost	Cost
18. Electrical connection for S/S processes						
Assumes the distance from the treatment facility to ele		2,000	ft			
Electrical wiring assumes #10		3,000	ft			
Assuming 3 - 1/0 wires from treatment facility to electrical connection		6,300	ft			
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.

Table 3-4b Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Capital Costs					
Construction Management (2.5% of total capital	Includes submittals, reporting, meetings over 12 month duration	LS	1	$198,565.66	$198,566
Treatability Study		LS	1	$50,000.00	$50,000
Institutional Controls		Each	1	$5,700.00	$5,700
Subtotal					$254,266
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.	SY	7,583	$1.84	$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					$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	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	$78.04	$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

Table 3-4b Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					$5,115,602
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)	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
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					$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					$4,109
				Capital Cost Subtotal:	$8,196,892
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$8,049,348
				10% Legal, administrative, engineering fees, construction management:	$804,935
				15% Contingencies:	$1,328,142
				Total Capital Cost:	**$10,183,000**

Table 3-4b Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, CP-51 SCOs

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
				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	$9,600
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:	$943
				15% Contingencies:	$1,555
				5-Year Total:	**$11,925**
				30-Year Present Worth of 5-Year Costs:	**$34,000**
				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
WWTP = waste water treatment plant

Table 3-4b Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, CP-51 SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost

Notes:

Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)

	Index	Markup
1/1/2014	100	none
2013	99	101%
2012	96	104%
2007	84	120%
2006	80	125%
2002	64	157%
2000	60	168%
1989	46	218%

Assumptions:

1. Soil Volumes
   - a. Total estimated non-TSCA contaminated soil volume for treatment = 15,655 BCY, based on N\SDEC shapefiles provided to
   - b. Total estimated TSCA contaminated soil volume (PCBs >= 50 ppm) = 1,784 EEEPC December 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 treatment zones. Actual cut-backs would be excavated per OSHA guidelines.
2. Surface Areas =
   - a. Non-TSCA treatment area = 56,276 SF, as obtained from EEEPC CAD department December 2014
   - b. Estimated TSCA excavation area = 8,717 SF, as obtained from EEEPC CAD department December 2014
   - c. Total estimated cut-back soil area = 3,250 SF
   - d. Total excavated soil area = 11,967 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/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 = 73

   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 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 900 SF of bottom area.
7. Local sales tax for soil disposal 6% Per WasteManagement quote from September 3, 2013
8. Soil transport fuel surcharge 40% Per WasteManagement quote from September 3, 2013
9. New York sales tax for disposal services 8% Per WasteManagement quote from September 3, 2013
10. Average reported production rate of in situ stabilization/ solidification = 1,000 cubic yards per 1.1 Months (USEPA Solidification/Stabilization Use at Superfund Sites (EPA-542-R-00-010))
    - 60 BCY/day
    - 75% assumed effective operating rate for maintenance and downtime
    - 45 BCY/day, effective production rate
    - 349 days, or 11.0 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 stabilization 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 monolithic 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 = 350 days, or 12.0 months
17. Present value of costs assumes 5% annual interest rate.

Table 3-4b Revised Cost Estimate for Alternate 5 - In Situ PCB Solidification, Off-Site Disposal of TSCA Waste, CP-51 SCOs

Item Description	Comment		Unit	Quantity	Unit Cost	Cost
18. Electrical connection for S/S processes						
Assumes the distance from the treatment facility to ele		2,000	ft			
Electrical wiring assumes #10		3,000	ft			
Assuming 3 - 1/0 wires from treatment facility to electrical connection		6,300	ft			
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.

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

Item Description	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.	BCY	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

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

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Subtotal					$2,639,449
Reconstruction					
Backfill	common earth, 3/4 CY bucket, front-end loader, includes borrow, loading, and spreading and materials. Includes excavations and inlet areas.	BCY	10,979	$18.73	$205,645
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	$11,609
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					$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
				Capital Cost Subtotal:	$3,299,436
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$3,240,046
				10% Legal, administrative, engineering fees:	$324,005
				15% Contingencies:	$534,608
				Total Capital Cost:	**$4,099,000**
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
				Annual Cost Total:	**$0**
				Present Worth of Annual Costs	**$0**

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

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
				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:	$943
				15% Contingencies:	$1,555
				5-Year Total:	**$11,925**
				30-Year Present Worth of 5-Year Costs:	**$34,000**
				2014 Total Present 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
WWTP = waste water treatment plant

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

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
Notes:					
Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)		Index	2014 Markup		
		1/1/2014	100	none	
		2013	99	101%	
		2012	96	104%	
		2010	91	110%	
		2007	84	120%	
		2006	80	125%	
		2002	64	157%	
Assumptions:					
1. Excavation volumes					
a. Total estimated non-TSCA contaminated soil volume =			8,672	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=			523	BCY	
d. Total excavated soil volume =			10,979	BCY	
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.					
2. Total excavation area =					
a. Non-TSCA excavation area =		30,716	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 =		1,972	SF		
d. Total excavated soil area =		41,405	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/cf	
4. In-situ soil swell factor assumed =		7%			
5. Number of characterization samples for landfill =		12			
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 =		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 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 900 SF of bottom area.					
7. Maximum excavation depth =		10	ft BGS		
8. 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		
9. Assuming effective production rate, time to excavate soil =		14	days, or	1.0	months
10. For loose soil assume sandy, dry soil with swell factor =		12%			
(Means Estimating Handbook. United States of America : Means Southern Construction Information Network, 1990).					
11. Backfill volume for site restoration =		10,979	BCY, or		
		12,296	LCY		
12. Topsoil density assumed to be =		1.2	Tons/LCY		
13. Topsoil volume for site restoration (0.5ft thick) =		569	BCY, or		
		637	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					
		75%	assumed effective production rate		
		413	BCY/day, effective production rate		
15. Assuming effective production rate, time to backfill soil =		31	days, or	2.0	months

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

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, 31.23.23.23.6200					
		75% assumed effective production rate			
		1,950 BCY/day, effective production rate			
17. Assuming effective production rate, time to compact soil =		7 days, or	1.0 months		
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 months		
21. Mob/demob assumed to be =		20 days, or	1.0 months		
22. Assumed length of perimeter fence =		2,600 LF, as obtained from EEEPC CAD department December 2014			
23. Assumed total duration of site work =		90 days, or	3.0 months		
24. Present value of costs assumes 5% annual interest rate.					
25. Local sales tax for soil disposal		6% Per WasteManagement quote from September 3, 2013			
26. Soil transport fuel surcharge		40% Per WasteManagement quote from September 3, 2013			
27. New York sales tax for disposal services		8% Per WasteManagement quote from September 3, 2013			
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.					

Table 3-6 New Cost Estimate for Excavation and Off-Site Disposal, Alternative 7, Part 375 Unrestricted SCOs

Item Description	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					
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

Table 3-6 New Cost Estimate for Excavation and Off-Site Disposal, Alternative 7, Part 375 Unrestricted SCOs

Item Description	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 excavations and inlet areas.	BCY	31,480	$18.73	$589,657
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 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					$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
				Capital Cost Subtotal:	$7,671,972
				Adjusted Capital Cost Subtotal for Albany, New York Location Factor (0.982):	$7,533,877
				10% Legal, administrative, engineering fees:	$753,388
				15% Contingencies:	$1,243,090
				Total Capital Cost:	**$9,531,000**
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
				Annual Cost Total:	**$0**
				Present Worth of Annual Costs	**$0**

Table 3-6 New Cost Estimate for Excavation and Off-Site Disposal, Alternative 7, Part 375 Unrestricted SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost
5-Year Costs (Periodic Costs)					
Not Applicable		Hr	0	$120.00	$0
Subtotal					$0
				5-Year Cost Subtotal:	$0
				Adjusted Annual Cost Subtotal for Albany, New York Location Factor (0.982):	$0
				10% Legal, administrative, engineering fees:	$0
				15% Contingencies:	$0
				5-Year Total:	**$0**
				30-Year Present Worth of 5-Year Costs:	**$0**
				2014 Total Present 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
WWTP = waste water treatment plant

Table 3-6 New Cost Estimate for Excavation and Off-Site Disposal, Alternative 7, Part 375 Unrestricted SCOs

Item Description	Comment	Unit	Quantity	Unit Cost	Cost

Notes:

Historical Cost Index (as obtained from RSMeans Facilities Construction Cost Data 2014 29th Ed.)

	Index	2014 Markup
1/1/2014	100	none
2013	99	101%
2012	96	104%
2010	91	110%
2007	84	120%
2006	80	125%
2002	64	157%

Assumptions:

1. Excavation volumes
   - a. Total estimated non-TSCA contaminated soil volume = 28,197 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= 1,499 BCY
   - d. Total excavated soil volume = 31,480 BCY

   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.
2. Total excavation area =
   - a. Non-TSCA excavation area = 117,117 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 = 6,292 SF
   - d. Total excavated soil area = 132,126 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/cf
4. In-situ soil swell factor assumed = 7%
5. 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.
6. 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 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 900 SF of bottom area.
7. Maximum excavation depth = 10 ft BGS
8. 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
9. Assuming effective production rate, time to excavate soil = 40 days, or 2.0 months
10. For loose soil assume sandy, dry soil with swell factor = 12%

    (Means Estimating Handbook. United States of America : Means Southern Construction Information Network, 1990).
11. Backfill volume for site restoration = 31,480 BCY, or

    35,258 LCY
12. Topsoil density assumed to be = 1.2 Tons/LCY
13. Topsoil volume for site restoration (0.5ft thick) = 2,169 BCY, or

    2,429 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

    75% assumed effective production rate

    413 BCY/day, effective production rate
15. Assuming effective production rate, time to backfill soil = 91 days, or 4.0 months

Table 3-6 New Cost Estimate for Excavation and Off-Site Disposal, Alternative 7, Part 375 Unrestricted SCOs

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, 31.23.23.23.6200						
		75%	assumed effective production rate			
		1,950	BCY/day, effective production rate			
17. Assuming effective production rate, time to compact soil =		19	days, or	1.0	months	
18. Assumedd area of inlet restoration		1,667	SY			
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	months	
21. Mob/demob assumed to be =		20	days, or	1.0	months	
22. Assumed length of perimeter fence =		2,600	LF, as obtained from EEEPC CAD department December 2014			
23. Assumed total duration of site work =		190	days, or	6.0	months	
24. Present value of costs assumes 5% annual interest rate.						
25. Local sales tax for soil disposal		6%	Per WasteManagement quote from September 3, 2013			
26. Soil transport fuel surcharge		40%	Per WasteManagement quote from September 3, 2013			
27. New York sales tax for disposal services		8%	Per WasteManagement quote from September 3, 2013			
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.						

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

Description	Alternative 1	Alternative 2	Alternative 3		Alternative 4		Alternative 5		Alternative 6	Alternative 7
			Excavation and Off-Site Disposal [1,2]		Excavation and On-Site Treatment by HTTD [1,2]		In-Situ Solidification [1,2]		Excavation and Off-Site Disposal[9]	Excavation and Off-Site Disposal[10]
	No Action	No Further Action with Site Management	PART 375 Commercial PCB SCOs	CP-51 PCB SCOs	PART 375 Commercial PCB SCOs	CP-51 PCB SCOs	PART 375 Commercial PCB SCOs	CP-51 PCB SCOs	PART 375 Industrial PCB SCOs	PART 375 Unrestricted 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**

Key:
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 NYCRR 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 NYCRR 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.

4 References

Ecology and Environment Engineering, Inc. (EEEPC). 2008. *Final Remedial Investigation Report for the Former Adirondack Steel Site, Colonie, New York.* Prepared for the New York State Department of Environmental Conservation. August 2008.

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_____. 2006. Remedial Program Soil Cleanup Objectives, 6 NYCRR Subpart 375-6.8. December 14, 2006.

_____. 2010a. DER-10, Technical Guidance for Site Investigation and Remediation, Albany, New York. May 3, 2010.

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