

Cost Opinion Report Port Lands, Toronto

Prepared for

Waterfront Toronto

Final May 31, 2016



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Acronyms and Abbreviations

$\$/m^3$	dollar per cubic metre
AACE	AACE International
CBRA	community-based risk assessment
CH2M	CH2M HILL Canada Limited
MVVA	Michael Van Valkenburgh Associates Inc.
Report	Stage 1 Preliminary Report (CH2M, 2015)
RMM	Risk Management Measurement
TPLC	Total Product Life Cycle
TRCA	Toronto and Region Conservation Authority
WT	Waterfront Toronto

Tab I. Cost Opinion Report

I.1 Task 17: Class 5 Remedial and Environmental Management Cost Opinion

I.1.1 Overview

Waterfront Toronto (WT) has contracted CH2M HILL Canada Limited (CH2M) to prepare a cost opinion to evaluate conceptual plans for excess soil reuse; disposal; fill importation; soil remediation, management and amendment; groundwater remediation, management and dewatering; risk management measures; community-based risk assessment (CBRA), and other environmental management-related costs.

I.1.2 Cost Opinion

I.1.2.1 Background

CH2M uses the AACE International (AACE) System as a basis for the development of construction cost opinions. This system uses a range of pricing based on a defined level of design. From this system, the Class 5 standard is typically used for strategic screening and long-range capital planning, and is appropriate where costing is required as a feasibility tool to evaluate pricing against a range of options. With this system, the level of design sets the upper and lower ranges of the cost opinion based on the level of design detail and uncertainty associated with that level of detail. As the level of design detail increases and the construction cost opinion is updated in subsequent design phases, the accuracy range will narrow. This cost opinion is considered a Class 5 as defined by AACE. It is considered accurate to between a low of -50 percent to a high of +100 percent of the costs provided and would typically carry a 30 percent contingency on the costs provided based on AACE standards.

I.1.2.2 Approach

The cost option provided herein is intended to support WT's Lead Cost Firm (Hanscomb), who is completing the Master Cost Report for the project. As part of this larger exercise, CH2M is responsible for providing cost opinion for specific aspects of the environmental components of the project only. The costing provided by CH2M contains no bonding, insurance, escalation or costs for planning, submittals, and development of Requests for Proposals (no consulting of any kind). At Hanscomb's request, CH2M has removed the 30 percent contingency that would typically be provided, as they intend to include contingency in the rolled-up costing.

CH2M has used internal quality assurance/quality control procedures to record, check, review, and transmit the cost opinion. Detail- and summary-level costs are provided herein. For each cost assessment package (such as, soil remediation and soil management), an individual cost tab has been generated with a breakdown of major components.

The cost opinion has been prepared by environmental professionals with specific background and experience in environmental construction. These costs have then been further reviewed by CH2M Internal Senior Cost Estimators.

The following is a list of the various cost resources used in the development of this cost estimate:

- Cost experience on similar projects or project components
- Vendor quotes on equipment and materials, where appropriate
- Published unit costs for labour and commodities
- Estimator judgment

The interface description and bounds for our cost opinion are described in Table I1.

Table I1. Definition of Cost Estimating Interface with the Waterfront Toronto Cost Estimator

Item	Interface and Decision
Risk Management Measures Cost Opinion	CH2M has provided Hanscomb with volumes of soil needed for risk management measure barriers and Hanscomb will include the cost of haulage from the onsite soil processing facility and the placement of the risk management measure (i.e. barrier). CH2M is not providing a cost opinion for vapour mitigation measures, as it is assumed a future developer will be responsible for these costs and there are no other buildings being developed in parkland areas.
Predemolition Abatement Cost Opinion	CH2M is providing the cost as a placeholder on a lump sum basis for designated substance removal for seven buildings. Hanscomb is estimating all the other costs for demolition
Road and Infrastructure and Building Demolition	Hanscomb is developing conceptual costing for road, infrastructure, and building demolition. MMM Group is providing demolition plans and volumes and categories of excess demolition material (that is, volume of asphalt, volume aggregate, and volume concrete) so that CH2M can capture this volume in the excess fill quantities. At present, this information is not available. The opportunity cost should be added into the risk evaluation.
Soil Remediation and Amendment	Soil remediation and amendment is proposed to be set up temporarily in a soil processing facility adjacent to the River Valley excavation with a longer-term, soil-processing system in Cousins Quay. CH2M is including the cost of the mobilization/demobilization, facility preparation, power, sewerage fees in our \$/m ³ rate. Costs provided assume that soil is delivered to the soil processing facility. Hanscomb is costing soil haulage, soil excavation, and soil dredging.
Regulatory Approvals	CH2M is providing a cost and time estimate for Part V Soil Processing Environmental Compliance Approval, CBRA, Record of Site Condition (three likely required), and permit to take water (if required).
Soil Stockpiling	CH2M is including \$/m ³ for managing the soil stockpiling site, which includes internal soil movement from the soil processing facility to the soil stockpile. Hanscomb is estimating the haulage from the soil stockpile site to the fill site.
Dewatering	CH2M is estimating the dewatering associated with excavating the River Valley. CH2M has calculated dewatering rates for roads and infrastructure construction based on MMM Group preliminary reports. Dewatering rates are being provided to Hanscomb, who are estimating the dewatering cost associated with roads and infrastructure.

Note:

\$/m³ - dollar per cubic metre

Tables I2 to I10 include the CH2M cost opinion. Assumptions and details are provided in each table.

The costs have been summarized in the following categories:

- CBRA
- Soil amendment for geotechnical purposes, including:
 - Soil screening
 - Soil washing

- Soil remediation
- Offsite soil disposal
- Fill import costs
- Groundwater management & dewatering
- Groundwater remediation
- Other environmental management measures

I.1.3 Major Assumptions

CH2M has provided assumptions in developing costs directly within the individual cost Tables I2 to I10.

I.1.4 Limitations and Exclusions

The Stage 2 Final Report (Report) (CH2M, 2016) submitted under the Environmental, Geotechnical, and Hydrogeological Environmental Strategy and Civil Engineering (Earthworks) scope by CH2M for the Port Lands Study Area located in Toronto, Ontario was prepared at the request of WT.

The findings and conclusions regarding environmental approaches for the Study Area are based solely on the extent of information gathered during the completion of this assessment. In preparing the Report, CH2M relied, in whole or in part, on data and information provided by WT and third parties, which information has not been independently verified by CH2M and which CH2M has assumed to be accurate, complete, reliable, timely, non-infringing and fit for the intended purpose. The documents submitted are based solely on information contained in existing reports or data provided by WT and its contractors, and did not include any intrusive sampling or analysis.

Soil, groundwater, and environmental conditions, events, and observations described in CH2M’s documents are based on data collected by others between 1991 to present and provided by WT. Chemistry data were provided by the Toronto and Region Conservation Authority (TRCA) in a Microsoft Access-based database. Survey elevations were provided in light detection and ranging (LIDAR) data. Final grading plans were provided in a two-dimensional plans by Michael Van Valkenburgh Associates Inc. (MVVA). Infrastructure plans were provided by the MMM Group. Additional interdependencies are provided in Table I11. Therefore, while CH2M has used its knowledge and experience in preparing this Report, CH2M does not warrant or guarantee the conclusions set forth in this Report that are dependent or based upon data, information, or statements supplied by third parties or WT.

Table I11. Interdependencies on Information Supplied by Project Partners and Project Consultants

CH2M Interdependency on Information from Others (Project Partners and Project Consultants)	Detail
Flood model	Cut/fill sequence developed currently being validated by TRCA.
LIDAR data	LIDAR data provided defined current conditions.
MVVA Grading Plan	Future grading plan provided by MVVA and together with LIDAR data defines cut/fill.
TPLC input	Identification of buildings for demolition.
TPLC reports	Limited knowledge of designated substances in buildings for demolition from TPLC updates.
YPDT dataset	YPDT database relied on for historical chemistry and geology; data transfer from source database potentially a concern and quality of database a concern.

CH2M Interdependency on Information from Others (Project Partners and Project Consultants)	Detail
YPDT dataset	Cut and fill of specific units based on YPDT borehole elevations and soil descriptions. Original borehole logs unavailable in some instances.
Stakeholder endorsement	Soil management strategy will be developed through risk management framework. Stakeholders and current and future land owners endorsement to be confirmed through CBRA.
Regulatory procedure	Quality of fill imported to Essroc Quay assumed through risk management framework. Regulatory/TRCA position to be confirmed.
Historical data provided by WT	Absent data in some blocks; incomplete Phase One and Phase Two Environmental Site Assessments. Relied on report set from WT/TRCA and assumptions made to fill gaps.
Thicknesses of soil provided by MVVA	Planning design from MVVA for wetlands, grass, and tree areas is part of overall RMM.
Construction of valley wall in MVVA plans	No unique soil has been identified as being required for the River Valley wall.
Thicknesses of armouring provided by MVVA	Flood armouring design from MVVA for River Valley channel to be part of overall RMM.
Preliminary precinct planning information	Geotechnical requirements assumed from understanding of preliminary redevelopment concept but no knowledge of specific requirements for buildings.
Precinct plan for location of heritage buildings	Heritage building are to remain in place and to continue to be serviced. Revised MVVA grading plan assumed to provide for keeping heritage buildings in place without additional specific flood protection measures.

Notes:

RMM - Risk Management Measure

TPLC - Total Product Life Cycle

Environmental site conditions are variable. Interpretations of groundwater levels and flow direction are based on water-level measurements that were either provided in existing reports or from data recently collected by WT’s consultant at selected monitoring well locations and are expected to fluctuate. Borehole and monitoring well observations indicate the approximate subsurface conditions only at those locations. Boundaries between zones are often not distinct, but rather may be transitional and have been interpreted. Subsurface conditions between boreholes, monitoring wells, and sampling locations have been inferred and may vary significantly from conditions encountered at those locations. Inaccuracies have been noted in the provided database. CH2M cannot confirm that all data in the database is correct. The evaluation has identified a number of data gaps in information and CH2M has made assumptions on the decided approach.

This cost opinion has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on approach to the work, implementation schedule, market conditions affecting competition by Contractors, actual labour and material costs by the successful Contractor and other variable factors. As a result, the final project costs will vary from the estimate presented herein. Because of this, project feasibility and

funding needs must be carefully weighed and reviewed before making specific financial decisions to help confirm proper project evaluation and adequate funding.

All findings and conclusions stated in CH2M's submissions are based on facts and circumstances as they existed during the preparation of the documents. Should additional environmental or related information become available after the date of this report, CH2M reserves the right to review this new information and modify, as deemed necessary, any or all of the opinions presented in this Cost Opinion Report.

CH2M accepts no responsibility for damages, if any, incurred by a third party as a result of decisions made or actions taken based on this cost opinion and any associated reports prepared by CH2M.

I.1.5 References

AACE International (AACE). 2011. "Cost Estimate Classification System." Recommended Practice No. 17R-97.

CH2M HILL Canada Limited (CH2M). 2015. *Stage 1: Draft Preliminary Environmental Assessment and Geotechnical and Earthworks Report*. September 30.

CH2M HILL Canada Limited (CH2M). 2016. *Stage 2: Draft Preliminary Environmental Assessment and Geotechnical and Earthworks Report*. February 26.

Tables

Waterfront Toronto

Port Lands Flood Protection and Enabling Infrastructure

Table I2.

	Cost Item Description	Unit	Quantity	Rate	Total	Stage 1	Stage 2- Stage 1	Notes
I3	CBRA Costs	Ea	1	\$ 750,000	\$ 750,000	\$ 271,800	\$ 478,200	
	Soil Amendment Costs for Geotechnical Purposes							
I4	- Soil Screening	m ³	424,000	\$ 15	\$ 6,360,000	\$ 9,945,000	\$ (3,585,000)	Does not include cost to manage or process excess soil. Includes excavation volume from C4e.
	- Stockpile and manage excess soil within Port Lands	m ³	362,000	\$ -	\$ -		\$ -	Cost to be carried by others. Assumes excess soil generated will be stockpiled and managed for future use by WT.
	Soil Remediation Costs							
I5	- River Valley Soil Remediation	m ³	321,000	\$ 65	\$ 20,865,000	\$ 19,500,000	\$ 1,365,000	Includes excavation volume from C4e.
I6	Off-Site Soil Disposal of Contaminated Soil	m ³	164,000	\$ 120	\$ 19,680,000	\$ 26,460,000	\$ (6,780,000)	Assumed that maximum of 15% disposal target can be achieved. Excess soil generated will be stockpiled and managed for future use by WT.
I7	Fill Import Costs	m ³	100,000	\$ 30	\$ 3,000,000	\$ 3,000,000	\$ -	
	Groundwater Management and Dewatering Costs							
I8	- Dewatering of Sediments following Excavation (Vibratory/Shaker Screen, Hydro Cyclone, Geotubes)	m ³	609,000	\$ 38	\$ 23,142,000	\$ 14,820,000	\$ 8,322,000	Quantity include dredgeate from sediment basin (Area C4e). Assumed rate at \$38 to achieve overall reduction required by WT; considered feasible through value engineering, detailed design and alternative approaches such as purchase of hydrocyclone equipment for long term use by TRCA
	- Treatment of Water from Dewatering River Valley soils	m ³	913,500	\$ 24	\$ 22,000,000	\$ 20,740,000	\$ 1,260,000	Assumed rate at \$24 to achieve overall reduction required by WT; considered feasible through value engineering, detailed design and alternative approaches such as purchase of water treatment equipment for long term use by TRCA
	- Treatment of Water from Infrastructure Dewatering	m ³	1,169,714	\$ 10	\$ 11,698,000	\$ 5,809,000	\$ 5,889,000	Stage 2 estimate is based on revised infrastructure design.
	- Discharge to sewer (sum total of volume of two lines above)	m ³	2,083,214	\$ 1.82	\$ 3,792,000	\$ 2,491,000	\$ 1,301,000	Provisional - permit/fee charge if discharge to sewer is required and fees are applied
	Groundwater Remediation Costs							
I9	- Open Excavation Water Treatment (Skimming)	Litres	907,200	\$ 1.19	\$ 1,078,000	\$ 1,078,000	\$ -	Provisional - Cost may be required if discharge fees are required
I10	Other Environmental Management Measures Costs	LS	1	\$ 5,685,000	\$ 5,685,000	\$ 5,685,000	\$ -	

Note:

1. Refer to soil management plan (Tab F) for details on the cut/fill volume calculations and description of the work process
2. Cost to manage, process or transport excess soil is not included
3. Refer to tables I3 - I10 for additional details related to cost items

Table I3. Detailed Breakdown: Community Based Risk Assessm

Breakdown Item Description	Labour Hours	Total
Project Management	800	\$95,000
Preconsultation (spring/summer 2016)		
a-1) Development of Technical Memorandums Site Characterization TM VI Assessment Approach TM Human Health Exposure Assumptions Future RSC Approach for Relevant Areas	2,000	\$205,000
Preconsultation (summer/fall 2016)	1,700	\$180,000
Preconsultation (summer/fall 2016)		
b) Stakeholder Meetings/Workshops/PIC i) Preconsultation Workshops ii) Public Information Centres iii) Small Group Meetings Meetings with WT and Contingency	800	\$95,000
CBRA Document Development	1,200	\$130,000
Contingency	450	\$45,000
Community Based Risk Assessment (CBRA) Costs	6,950	\$750,000

Table I3: Major Assumptions

- 1 Additional updates may be required to the SMP, GMP, remediation and RMM reports
- 2 Three public meetings. We would prepare presentation boards and power point presentation.
- 3 Ten stakeholder meetings (roughly biweekly) attended by two staff
- 4 Consolidated comments would be provided on the draft and a revised draft would be issued
Additional data collection is included in the data gap assessment. No additional cost for data collection is
- 5 included in the CBRA cost estimate.
- 6 Weekly one hour meetings with Waterfront Toronto

Table I4. Detailed Breakdown: Soil Amendment Costs

Breakdown Item Description	Unit	Quantity	Rate	Total
Dry soil geotechnical ammendment (Screening)	m ³	424,000	\$ 15	\$ 6,360,000
Excess soil	m ³	362,000		\$ -
Soil Amendment Costs				\$ 6,360,000

Table I4: Major Assumptions

Screening Assumptions

- 1 Assumes that all dry soil will require screening to separate oversize soil, garbage, debris, and inert materials
- 2 Cost does not include transportation of soils from the excavation area to the screening area
- 3 Costs do not include any disposal or transportation costs associated with the screened material
- 4 It is expected that more than one screening operation will be required to address the various types of fill material present at the site. The unit rate costs represents an average costs for the multiple operations.
- 5 Assumes large oversize materials will be separated during the excavation process
- 6 Excess soil is not screened

Table 15. Detailed Breakdown: Soil Remediation Costs

Breakdown Item Description	Unit	Quantity	Rate	Total
Ex-Situ Bioremediation or Soil Washing	m ³	321,000	\$ 65	\$ 20,865,000
Soil Remediation Costs	m³	321,000	\$ 65	\$ 20,865,000

Table 15: Major Assumptions

- 1 Cost to move soil from excavation to soil processing area have not been included
- 2 Costs are based on an active approach to biopile treatment with the addition of biodegradation enhancing amendments
- 3 Costs are based on a minimum of 6 turns per biopile for aeration
- 4 Suitable space is available to create manage bio piles varying in size between 200-300 m³ each
- 5 Assumes the total volume of soil required biopile treatment will be completed over multiple years based on the phases of the project and available space and time during each construction season
- 6 Costs to haul treated soils away from the treatment site are not included
- 7 Basic soil sampling cost to monitor treatment progress area included
- 8 Assumes the work will be completed under an existing mobile ECA. Cost for a site specific ECA are included in the environmental management costs
- 9 Assumes soils are suitable for bioremediation and pre-screened for a determination
- 10 Treatment only to be completed during optimal weather conditions during late spring to early fall
- 11 Soils are free of debris
- 12 Soils are suitably dewatered
- 13 Water is available on site for use, as required to moisten or mix amendments, either from the municipal water system of uncontaminated recycled process water
- 14 Soils will be treated to meet Table 3 Residential/Parkland criteria or S-GW3 risk based values for re-use

Soil Washing Assumptions

- 1 Assumes a cold washing operation
- 2 The fines will be dewatered via geotube bags
- 3 Wash water will be treated via mobile carbon treatment system
- 4 Fines will be stockpiled for relocation by others
- 5 It is assumed that wash water is available at the site via either municipal water system or recycled water from other treatment process onsite.
- 6 Cost are based on an average production rate of 500 m³ per day

Table I6. Detailed Breakdown: Offsite Disposal Costs

Breakdown Item Description	Unit	Quantity	Rate	Total
Non-Hazardous Contaminated Soil Cost	m ³	164,000	\$ 120	\$ 19,680,000
Offsite Disposal Costs				\$ 19,680,000

Table I6: Major Assumptions

- 1 Non-hazardous soil disposal rate assumes soil meets slump test for acceptance at the landfill
- 2 Conversion factor of 2 metric tonne per cubic meter of soil was used
- 3 Cost includes transportation and disposal to a licensed waste disposal facility
- 4 Excavation and loading costs are not included

Table 17. Detailed Breakdown: Fill Import Costs

Breakdown Item Description	Unit	Quantity	Rate	Total
Clean Fill (Table 3 R/P) Import Costs	m ³	100,000	\$ 30	\$ 3,000,000
Fill Import Costs Costs	m³	100,000	\$ 30	\$ 3,000,000

Table 17: Major Assumptions

- 1 Assumes clean fill is available within the City of Toronto (50 km radius)
- 2 Assumes clean fill provider has complete environmental screening
- 3 Environmental sampling and screening costs not included
- 4 Assumes fill meets Table 3 Residential/Parkland requirements
- 5 Costs include the transportation of clean fill to the site in trailer dump trucks (35-40 mt/load)

Table I8. Detailed Breakdown: Groundwater Management and Dewatering Costs

Breakdown Item Description	Unit	Quantity	Rate	Total
Dewatering Treatment				
Treatment of Water from Infrastructure Dewatering to manage contaminants	m ³	1,169,714	\$ 10	\$ 11,697,140
GW Management				
Mobile Water Treatment Unit (Labour and Equipment)	month	63	\$ 200,000	\$ 12,600,000
Water Treatment Effluent Sampling	week	252	\$ 1,000	\$ 260,000
Water Treatment Consumables	m ³	913,500	\$ 10	\$ 9,140,000
	m ³		\$ 24	\$ 22,000,000
Dewatering				
Shaker Screen	m ³	609,000	\$ 20	\$ 12,180,000
Hydro Cyclone System	m ³	182,700	\$ 40	\$ 7,308,000
Geotube Dewatering (Fines)	m ³	60,900	\$ 60	\$ 3,654,000
	m ³		\$ 38	\$ 23,142,000
Sewer Disposal Fee				
Sewer Disposal Fee	m ³	2,083,214	\$ 1.82	\$ 3,792,000
				\$ 3,792,000
Groundwater Management and Dewatering Costs				\$ 48,934,000

Table I8: Major Assumptions

- 1 Assume weekly sampling for TSS, VOC, PAH, PHC only based on contaminants of concern, on a regular turn around time.
- 2 Effluent treatment criteria to meet Sanitary Sewer by-law
- 3 Cost for PPTW is not included
- 4 It is assumed that 1 unit will be required to treat GW and it will be used for water at various locations
- 5 Dredged material will be dewatered through a hydro cyclone technology
- 6 The fines fraction separated from the hydro cyclone will be further dewatered via geotube bag technology.
- 7 The process water from the geotube and centrifuge will be treated via the mobile treatment system.
- 8 It is assumed that 80% of the dredged material will be separated as sand and 20% will be separated as fines
- 9 The dewatering process is expected to require the use of some polymer or flocculants
- 10 The dredging approach is assumed to be via clamshell bucket with an approximate solids to water ratio of 30 to 50 percent.
- 11 Should additional water be required to dilute the dredgeate prior to the hydro cyclone, process water will be recycled into the system
- 12 All dredged material will be process through shaker screen to remove oversize material prior to entry into the hydro cyclone
- 13 Monthly rate for the water treatment unit includes basic operation and maintenance
- 14 Water treatment system includes bag filters, sand filters, and carbon vessels with a capacity of approximately 12,000 L/min
- 15 Cost include basic ECA reporting requirements such as monthly review and sharing of sampling results
- 16 Cost for an ECA is included in the environmental management costs
- 17 Sewer disposal fee was obtained from the City of Toronto and is a current rates of September 30, 2015
- 18 The unit rate costs for treatment of water from the dewatering activities associated with the infrastructure installation is assumed to be the same for the treatment of water from the river valley dredging work.
- 19

The volume of groundwater generated from the dewatering for infrastructure installation was estimated to be 83,551 m³ per day of trenching. It is assumed that the trenching will be completed in section; however, over the life of the work, each section will require dewatering for approximately 14 days to allow for soils to dewater appropriately to provide dry conditions. Assumes only 25% of groundwater will require filtration to manage petroleum hydrocarbon contamination.

- 20 Consumable costs have been included at an assumed cost of \$10 per m³

Table I9. Detailed Breakdown: Groundwater Remediation Costs

Breakdown Item Description	Unit	Quantity	Rate	Total
Free product disposal	litres	907,200	\$ 0.18	\$ 164,000
Skimming Operations	month	63	\$ 5,000	\$ 315,000
Weir tank (2)	month	63	\$ 4,000	\$ 252,000
Labour	hr/month	6,300	\$ 55	\$ 347,000
Groundwater Remediation Costs	Litres	907,200	\$ 1.19	\$ 1,078,000

Table I9: Major Assumptions

- 1 Assumes the collection of 100 Litres of free phase product per day, 6 days per week, 9 months per year for 7 years
- 2 Free phase product to be collected through weir tanks and removed by a Vac truck
- 3 Free phase product to be disposed of off site at a licenses disposal facility
- 4 Assumes skimming operations is required for the duration of the project
- 5 Groundwater separated from free phase product will be treated onsite via a mobile water treatment system
- 6 No sample analyses is included
- 7 A separate ECA is not required to complete this work
- 8 It is assume the work can be overseen by one part time labourer

Table I10. Detailed Breakdown: Environmental Management Costs

Breakdown Item Description	Unit	Quantity	Rate	Total
Designated Substance Abatement	LS	1	\$ 1,100,000	\$ 1,100,000
Air Monitoring	year	7	\$ 230,000	\$ 1,610,000
PTTW	Ea	1	\$ 100,000	\$ 100,000
ECA Application	Ea	1	\$ 100,000	\$ 100,000
Pilot Tests	Ea	4	\$ 150,000	\$ 600,000
Record of Site Conditions	Ea	3	\$ 386,667	\$ 1,160,000
Data Gap	Ea	1	\$ 1,015,000	\$ 1,015,000
Environmental Management Costs				\$ 5,685,000

Table I10: Major Assumptions

DSS Abatement

- 1 It's assumed that only seven buildings require demolition: 75, 95, 97 and 99 Commissioners Street; 222, 242 and 312 Cherry Street
- 2 Abatement cost is provided as a placeholder only. CH2M has been provided data for 5 buildings. The data provided is not currently sufficient to provide a determination of abatement cost
- 3 Abatement pricing is based on \$100,000 per building for 6 of the buildings and \$500,000 for 242 Cherry Street

Air Monitoring Assumptions

- 4 Air monitoring based on monitoring for VOCs at 6 sites; PAHs at 4 sites; and continues PM10 at 4 sites
- 5 Each site would be sampled every 12th day, 30 samples per year, for 7 years
- 6 Air monitoring is required only for 7 years.
- 7 Costs are based on purchasing Tisch samplers and BAM samplers, renting Canisters for VOC analysis
- 8 Includes lab costs for VOC and PAH sampling
- 9 Includes calibration costs
- 10 Includes labour to complete monthly reporting, installation, collection, travel and misc. expenses

PTTW

- 11 Category 3 permit to take water is assumed to be required and standard costs for permit applications are included.

ECA Application

- 12 An ECA Application is expected to be required for the soil processing facilities; air and noise from environmental operations; industrial sewage discharge; and standard costs for permit applications are included including fees.

Pilot Tests

- 13 Several pilots are anticipated: soil dewatering; soil screening and washing; compaction tests; LNAPL skimming; bioremediation

Record of Site Condition

- 14 Assumed that three RSCs will be required and each will need a formal Phase One ESA, Phase Two ESA, and RA

Data Gaps

- 15 A data gap program was developed from the data gap tabulated in Tab A Conceptual Site Model