



February 4, 2009

Dave Weinstein
Community & Economic Development Office
Room 32, City Hall
149 Church Street
Burlington, Vermont 05401

RE: Work Plan: Moran Plant Cleanup Activities
Moran Plant, Burlington, Vermont (SMS Site #2005-3357)

Dear Dave:

Waite Environmental Management, LLC (WEM) has developed a work plan/cost estimate for budgetary planning of the future cleanup activities at the Moran Plant. Alan Liptak at KAS provided valuable input, and several contractors provided estimates to help fine tune these numbers. The work has been separated into two categories: interior and exterior. The interior work will need to be done regardless of the future use of the building. The interior work described below does not include sampling of the concrete for the presence of PCBs, which if required based on visual inspection of the basement floor after it is dewatered and cleaned, will add significant costs. The exterior work is less clear, as the need for covering and removing of soil will be dependent on the future site design. Exterior cleanup costs may be reduced if future public exposure to shallow soil contamination can be minimized using engineering or institutional controls.

SCOPE OF WORK

The scope of work is described below with estimated costs. Refer to the attached spreadsheet for a more detailed cost analysis.

1. Reporting / Project Management / Meetings

WEM will document all cleanup activities and provide reports to describe the work that is completed. Reports will provide data collected and as-built drawings.

Project management duties will include planning/coordination, correspondence (City, regulators, and site developers), meetings/hearings, budgeting, etc.

Estimated Cost:

<i>Interior work</i>	<i>\$4,675</i>
<i>Exterior work</i>	<i><u>\$4,675</u></i>
<i>Total</i>	<i>\$9,350</i>

2. Interior Dewatering

WEM will install a pump in an appropriate low spot in the 96.0 ft elevation basement to attempt to dewater the basement in the spring. The pump will be connected to a temporary electrical service to be installed near the large overhead door on the east side of the building. Discharge hoses will extend from the building to the south over the Burlington Electric Department property to a manhole connected to the sanitary sewer system.

Pumping, limited to a flow of 5 gpm, is anticipated to take 10-14 days. This assumes that the water depth inside the basement does not increase beyond 1 foot (it is currently at approximately 9 inches) and that water infiltration into the building is minimal. WEM will be regularly checking on the pumping system to monitor the progress.

If water infiltration into the building is significant enough to hamper the ability of this pumping system to dewater the space, then a more aggressive technique will need to be utilized. A second pump will be installed for pumping to a temporary water storage tank (frac tank) to be set up in the yard east of the building. The water from this tank can then be discharged to the sanitary sewer over a longer period of time. This task involves frac tank mobilization, tank cleaning, and tank demobilization.

To manage infiltration into the building on a long-term basis, the sump pump used for dewatering will remain in use over the summer and fall months with continued discharge to the sanitary sewer system.

<i>Estimated Dewatering Cost:</i>	\$6,000
<i>Contingency: Second Pump / Frac Tank Cost:</i>	\$14,430
<i>Contingency: Long Term Sump Pump Operation:</i>	\$850

3. Interior Debris and Sediment Removal

After the basement has been successfully dewatered, WEM will work with a hazardous waste contractor to remove the scrap metal debris and gross clean the sediment from the basement. The debris will be removed by hand and lifted using a small excavator to be brought into the 1st floor space next to the large overhead door on the eastern side of the building. The scrap metal waste will be placed in a roll-off dumpster for eventual disposal at a scrap metal yard. The sediment will be scraped/swept up using hand tools and a small skid steer to be lowered into the basement. The sediment will be contained in a second roll-off dumpster for eventual disposal at an approved RCRA hazardous waste disposal facility. All personnel working in the basement will be in low level C personal protective gear (Tyvek suits, half-mask respirators, hard hats, eye protection, gloves). This work is estimated to be complete in 10 business days. WEM will coordinate the work and conduct checks on the progress but will not be conducting any of the cleanup activities.

<i>Estimated Cost:</i>	\$82,000
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4. Interior Hazard Abatement: Lead Paint, Asbestos, and Guano

After the basement has been gross cleaned, stabilization of flaking lead paint, removal of asbestos containing materials, and removal of bird guano can proceed. The asbestos containing materials (corrugated transite panels, roof flashing, and window frame caulking) will be conducted by Vermont licensed asbestos abatement workers. The flaking lead paint, observed to present primarily on structural steel, will be removed in a lead safe manner by properly trained and licensed personnel. The guano will require initial gross cleaning with minimal usage of water followed by pressure washing. A containment system will be installed in the basement to contain and remove the washwater.

Once the guano is cleaned, there may need to be work done to close all of the large openings into the building to deter pigeons from using the space until the final construction is complete. The cost of pigeon deterrence is NOT included in this estimate.

Estimated Cost: **\$89,000**

5. Covering of Arsenic Contaminated Soil

Arsenic is ubiquitous in the shallow soil on the property, present both as a naturally occurring metal and as a trace component in the residual coal clasts/dust. Based on preliminary testing, there is a 16,000 ft² area in the north lawn under the footprint of the former coal storage pile that has concentrations in excess of a site specific guideline of 35 parts per million (ppm). To prevent public contact (dermal exposure and incidental ingestion) with this arsenic, it may need to be capped with a layer of clean soil. The scope of this work involves testing of topsoil sources, covering the area with a geotextile fabric followed by 6 inches of clean topsoil, grading and compacting the soil, and seeding/mulching. Silt fencing will be required around the work zone. Institutional controls (deed restriction) can be utilized to prevent future disturbance of the affected area.

Estimated Cost: **\$31,000**

6. Covering of PAH Contaminated Soil

Polycyclic aromatic hydrocarbons (PAHs) are ubiquitous in the shallow soil on the property, present as a by-product (airborne fallout) of the former coal burning operation. Based on preliminary testing, highest concentrations are immediately surrounding the building footprint. Lower concentrations are present in the north lawn. Based on the risk-based concentration for a hypothetical recreational user of 40 parts per billion for the PAH benzo(a)pyrene, an area in excess of 35,000 ft² may need to be capped to prevent public contact (dermal exposure and incidental ingestion) with PAHs. The scope of this work involves additional surficial soil testing to better define the capping area, testing of topsoil sources, covering the area with a geotextile fabric followed by 6 inches of clean topsoil (for lawn areas) or clean fill (for gravel areas), grading and compacting the soil, and seeding/mulching. Silt fencing will be required around the work zone. Institutional controls (deed restriction) can be utilized to prevent future disturbance of the affected area.

Estimated Cost: **\$65,000**

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7. Excavation of TCE Contaminated Soil

Chlorinated VOCs, specifically TCE, PCE and DCE are present in what has become known as the "hot spot" in the current boat storage yard immediately north of the building. These contaminants are assumed to be residual from the use of degreasing solvents on machinery located in this vicinity during the operation of the power plant. These contaminants are present in the soil that was tested at a depth of approximately 7 ft below grade, and are continually present in dissolved phase in the groundwater tested from this area. The TCE concentration in the soil from 7 ft depth is in excess of the EPA residential risk-based standard of 53 parts per billion. To mitigate risk of contact (public and construction worker) and remediate groundwater, a portion of this soil may need to be excavated. However, additional sampling will be required prior to any excavation to better characterize the vertical and horizontal extent of TCE. Further cost-benefit analysis will also be undertaken in the Corrective Action Plan, with consideration to a newer EPA risk-based standard of 2,800 ppb for TCE. For the purposes of estimating the cost of excavation, WEM is assuming a volume of 100 cubic yards. The scope of this work involves excavating the zone of contaminated soil, loading the soil into triaxle dump trucks for transport and disposal at the WTI-Moretown Landfill, and then backfilling the excavation with clean fill.

Estimated Cost:

\$36,500

BROWNFIELD REUSE INITIATIVE

The VT DEC provides financial assistance to qualified applicants for cleanup activities depending on specific project needs, available funding, and other considerations. This assistance is limited to \$200,000. As I understand, the VT DEC has indicated that the City may be able qualified for assistance. I suggest that we submit this budgetary estimate with an application for funding, with the hope that some of their funds would go toward the cleanup. I respectfully request that CEDO attempt to retain the services of WEM to orchestrate the cleanup activities, even though the VT DEC has their own list of approved Brownfield environmental contractors.

Do not hesitate to call me if you have questions or concerns. Please let me know whether you need any further assistance with the application.

Sincerely,

Miles E. Waite, PhD

Principal Hydrogeologist

Attachment



ATTACHMENT

COST ESTIMATES

**MORAN GENERATING PLANT
BURLINGTON, VERMONT
COST ESTIMATE: INTERIOR MORAN CLEANUP**

February 4, 2009

WORK ELEMENT / TASK	UNITS	CATEGORY	QTY	RATE	ELEMENT	COST
REPORTING / PROJECT MANAGEMENT / MEETINGS						
AS-BUILT REPORTING	HR	WEM -PRINCIPAL	4.0	\$90.00	\$360.00	
AS-BUILT REPORTING	HR	WEM -HYDROGEOLOGIST	16.0	\$75.00	\$1,200.00	
AS-BUILT REPORTING	HR	WEM - DRAFTING	5.0	\$65.00	\$325.00	
GENERAL PROJECT MANAGEMENT	HR	WEM -PRINCIPAL	15.0	\$90.00	\$1,350.00	
GENERAL CONSULTATION	HR	KAS - SENIOR	10.0	\$99.00	\$990.00	
ADMINISTRATIVE	HR	WEM - ADMIN	10.0	\$45.00	\$450.00	\$4,675
INTERIOR DEWATERING						
COORDINATION / SITE PREPARATION	HR	WEM -PRINCIPAL	12.0	\$90.00	\$1,080.00	
EQUIPMENT SETUP/MAINTENANCE	HR	WEM -HYDROGEOLOGIST	20.0	\$75.00	\$1,500.00	
EQUIPMENT SETUP/MAINTENANCE	HR	KAS- FIELD TECH	20.0	\$60.50	\$1,210.00	
PUMP, HOSES, SUMP BASIN	EA	ESTIMATE	1.0	\$600.00	\$600.00	
REPORTING	HR	WEM -PRINCIPAL	6.0	\$90.00	\$540.00	
TEMPORARY ELECTRICAL SERVICE	LUMP	ESTIMATE	1.0	\$1,000.00	\$1,000.00	
ELECTRICAL CONSUMPTION	LUMP	ESTIMATE	1.0	\$50.00	\$50.00	\$5,980
FRAC TANK CONTINGENCY (21,000 GALLON)						
COORDINATION / SITE PREP	HR	WEM -PRINCIPAL	6.0	\$90.00	\$540.00	
OVERSIGHT / DOCUMENTATION	HR	WEM - HYDROGEOLOGIST	40.0	\$75.00	\$3,000.00	
FRAC TANK MOB/DEMOB	EA	BAKER QUOTE	1.0	\$2,420.00	\$2,420.00	
FRAC TANK RENTAL	DAY	BAKER QUOTE	60.0	\$49.50	\$2,970.00	
PUMP RENTAL, HOSES, PLUMBING	EA	BAKER QUOTE	1.0	\$1,100.00	\$1,100.00	
FRAC TANK CLEANING	EST	EP&S	1.0	\$4,400.00	\$4,400.00	\$14,430
LONG TERM SUMP OPERATION						
OPERATION AND MAINTENANCE	HR	WEM -HYDROGEOLOGIST	10.0	\$75.00	\$750.00	
ELECTRICAL CONSUMPTION	LUMP	ESTIMATE	1.0	\$100.00	\$100.00	\$850
INTERIOR DEBRIS & SEDIMENT REMOVAL / DISPOSAL						
COORDINATION / SITE PREPARATION	HR	WEM -PRINCIPAL	8.0	\$90.00	\$720.00	
LABOR (LEVEL C PROTECTION)	LUMP	EP&S QUOTE	1.0	\$42,570.00	\$42,570.00	
VEHICLES/EQUIPMENT	LUMP	EP&S QUOTE	1.0	\$17,050.00	\$17,050.00	
MATERIALS	LUMP	EP&S QUOTE	1.0	\$7,150.00	\$7,150.00	
RCRA HAZARDOUS WASTE DISPOSAL	ROLLOFF	EP&S QUOTE	1.0	\$10,560.00	\$10,560.00	
SCRAP METAL DISPOSAL	ROLLOFF	EP&S QUOTE	1.0	\$2,750.00	\$2,750.00	
OVERSIGHT / DOCUMENTATION	HR	WEM -HYDROGEOLOGIST	20.0	\$75.00	\$1,500.00	\$82,300
INTERIOR HAZARD ABATEMENT: LEAD PAINT, ASBESTOS, GUANO						
COORDINATION / SITE PREP	HR	WEM -PRINCIPAL	8.0	\$90.00	\$720.00	
ASBESTOS ABATEMENT	LUMP	KD QUOTE	1.0	\$15,400.00	\$15,400.00	
LEAD PAINT ABATEMENT	LUMP	KD QUOTE	1.0	\$13,200.00	\$13,200.00	
GUANO ABATEMENT	LUMP	KD QUOTE	1.0	\$52,800.00	\$52,800.00	
STAGING RENTAL/SETUP	LUMP	TO BE DETERMINED	1.0	\$6,000.00	\$6,000.00	
OVERSIGHT / DOCUMENTATION	HR	WEM -HYDROGEOLOGIST	20.0	\$75.00	\$1,500.00	\$89,620
CONTINGENCY (10%)						\$19,790
TOTAL						\$217,645

**MORAN GENERATING PLANT
BURLINGTON, VERMONT
COST ESTIMATE: EXTERIOR MORAN CLEANUP**
February 4, 2009

WORK ELEMENT / TASK	UNITS	CATEGORY	QTY	RATE	ELEMENT	COST
REPORTING / PROJECT MANAGEMENT / MEETINGS						
AS-BUILT REPORTING	HR	WEM -PRINCIPAL	4.0	\$90.00	\$360.00	
AS-BUILT REPORTING	HR	WEM -HYDROGEOLOGIST	16.0	\$75.00	\$1,200.00	
AS-BUILT REPORTING	HR	WEM - DRAFTING	5.0	\$65.00	\$325.00	
GENERAL PROJECT MANAGEMENT	HR	WEM -PRINCIPAL	15.0	\$90.00	\$1,350.00	
GENERAL CONSULTATION	HR	KAS - SENIOR	10.0	\$99.00	\$990.00	
ADMINISTRATIVE	HR	WEM - ADMIN	10.0	\$45.00	\$450.00	\$4,675
ARSENIC SOIL CORRECTIVE ACTION						
SOIL COVERING W/ 6" CLEAN FILL: 16,000 FT2 (300 YARDS)						
COORDINATION	HR	WEM -PRINCIPAL	8.0	\$90.00	\$720.00	
QAPP ADDENDUM	HR	WEM -PRINCIPAL	4.0	\$90.00	\$360.00	
TOPSOIL TESTING (ARSENIC AND PAH)	HR	WEM - HYDROGEOLOGIST	4.0	\$75.00	\$300.00	
TOPSOIL TESTING (ARSENIC AND PAH)	SAMPLE	ENDYNE LAB	2.0	\$210.00	\$420.00	
DATA VALIDATION	LUMP	KAS	1.0	\$220.00	\$220.00	
SITE PREPARATION / SILT FENCING	LUMP	TO BE DETERMINED	1.0	\$7,700.00	\$7,700.00	
TOPSOIL -IN PLACE	YD	TO BE DETERMINED	300.0	\$55.00	\$16,500.00	
SEED, MULCH -IN PLACE	YD	TO BE DETERMINED	300.0	\$13.20	\$3,960.00	
OVERSIGHT / DOCUMENTATION	HR	WEM -HYDROGEOLOGIST	16.0	\$75.00	\$1,200.00	\$31,380
PAH SOIL CORRECTIVE ACTION						
CONFIRMATORY SURFACE SOIL TESTING						
QAPP ADDENDUM	HR	WEM -PRINCIPAL	4.0	\$90.00	\$360.00	
CONFIRMATORY SOIL SAMPLING	HR	WEM -HYDROGEOLOGIST	6.0	\$75.00	\$450.00	
LAB - PAHS BY 8270C (SOIL)	SAMPLE	ENDYNE LAB	8.0	\$170.00	\$1,360.00	
DATA VALIDATION	LUMP	KAS	1.0	\$330.00	\$330.00	
REPORTING	HR	WEM - HYDROGEOLOGIST	6.0	\$90.00	\$540.00	\$3,040
SOIL COVERING W/ 6" CLEAN FILL: 35,000 FT2 (650 YARDS)						
CONTRACTOR COORDINATION	HR	WEM -PRINCIPAL	16.0	\$90.00	\$1,440.00	
SITE PREPARATION / SILT FENCING	LUMP	TO BE DETERMINED	1.0	\$7,700.00	\$7,700.00	
ASPHALT REMOVAL/DISPOSAL	LUMP	TO BE DETERMINED	1.0	\$15,400.00	\$15,400.00	
MOB/DEMOB	LUMP	TO BE DETERMINED	1.0	\$2,200.00	\$2,200.00	
COMMON FILL - IN PLACE	YD	TO BE DETERMINED	250.0	\$19.80	\$4,950.00	
TOPSOIL -IN PLACE	YD	TO BE DETERMINED	400.0	\$55.00	\$22,000.00	
SEED, MULCH -IN PLACE	YD	TO BE DETERMINED	400.0	\$13.20	\$5,280.00	
OVERSIGHT / DOCUMENTATION	HR	WEM - HYDROGEOLOGIST	40.0	\$75.00	\$3,000.00	\$61,970
TCE SOIL CORRECTIVE ACTION						
CONFIRMATORY TEST PIT INVESTIGATION						
COORDINATION / SITE PREP	HR	WEM -PRINCIPAL	4.0	\$90.00	\$360.00	
QAPP ADDENDUM	HR	WEM -PRINCIPAL	4.0	\$90.00	\$360.00	
MOB/DEMOB	LUMP	TO BE DETERMINED	1.0	\$440.00	\$440.00	
EXCAVATOR / OPERATOR	HR	TO BE DETERMINED	6.0	\$154.00	\$924.00	
OVERSIGHT & CONFIRMATORY SAMPLING	HR	WEM - HYDROGEOLOGIST	6.0	\$75.00	\$450.00	
LAB - VOCS BY 8260 (SOIL)	SAMPLE	TESTAMERICA LAB	14.0	\$154.00	\$2,156.00	
DATA VALIDATION	LUMP	KAS	1.0	\$330.00	\$330.00	\$5,020
SOIL EXCAVATION ALONG NORTH WALL: 600 FT2 (150 YD)						
COORDINATION / SITE PREP	HR	WEM -PRINCIPAL	6.0	\$90.00	\$540.00	
MOB/DEMOB	LUMP	TO BE DETERMINED	1.0	\$660.00	\$660.00	
EXCAVATOR / OPERATOR	HR	TO BE DETERMINED	16.0	\$154.00	\$2,464.00	
LABORER	HR	TO BE DETERMINED	16.0	\$38.50	\$616.00	
TRANSPORT (TRIAxLE)	LOAD	TO BE DETERMINED	12.0	\$440.00	\$5,280.00	
DISPOSAL	TON	MORETOWN LANDFILL	225.0	\$66.00	\$14,850.00	
BACKFILL - IN PLACE	YD	TO BE DETERMINED	150.0	\$22.00	\$3,300.00	
OVERSIGHT & CONFIRMATORY SAMPLING	HR	WEM - HYDROGEOLOGIST	16.0	\$75.00	\$1,200.00	
MONITORING WELL REPLACEMENT	EA	TO BE DETERMINED	2.0	\$550.00	\$1,100.00	
MONITORING WELL REPLACEMENT	EA	WEM - HYDROGEOLOGIST	5.0	\$75.00	\$375.00	\$30,385
CONTINGENCY (10%)						\$13,650
TOTAL						\$150,120