MACTEC

September 23, 2004

Mr. Will Welling
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Program Management, 12th Floor
625 Broadway
Albany, New York 12233-7012

Dear Mr. Welling:

Subject: **Review of Remediation System Evaluation – SMS Instruments Site (152026)**
State Superfund Standby Contract
Work Assignment #D003826-10
RSO Pilot Project

As part of the Remedial System Optimization (RSO) Pilot Project, Harding Lawson Associates (HLA) was assigned to conduct a review of the December 9, 2003 Remediation System Evaluation (RSE) for SMS Instruments Superfund Site, Deer Park, New York. The RSE was conducted by the U.S. Environmental Protection Agency (EPA). The scope of this work is limited to reviewing the final report as prepared by EPA.

SITE OVERVIEW

SMS Instruments operated from about 1967 to1990 primarily overhauling military aircraft components. Operations consisted of cleaning, painting, degreasing, refurbishing, metal-machining, and testing of components. Until 1980, wastewater from the facility was discharged directly, without treatment to a leaching pool on the south side of the property. The leaching pool was cleaned and abandoned in 1980. In 1988 a leaking (jet fuel) underground storage tank was removed from the site. The site was listed on the National Priority List in June 1986. The U.S. Environmental Protection Agency performed a remedial investigation and feasibility study fro 1987 to 1989. Soil and groundwater contamination was concentrated in three areas: the former leaching pool, the vicinity of an excavated tank, and to a lesser extent, a drum storage area. The September 1989 Record of Decision called for the soil to be treated by soil vapor extraction and the groundwater to be extracted, treated, and injected into the ground. This was later revised to discharging the extracted groundwater to an onsite recharge basin. The soil vapor extraction system successfully operated from April 1992 to November 1993. The construction of the groundwater treatment system was completed in 1994.

MACTEC Engineering and Consulting, Inc.
511 Congress Street
P.O. Box 7050 • Portland, ME 04112-7050
207-775-5401 • Fax: 207-772-4762
Home Page: www.mactec.com

The following provides a summary of the pertinent information presented in the RSE.

1 Contaminants of Concern
- 1.1. 1,3-Dichlorobenzene
- 1.2. 1,2- and 1,4-Dichlorobenzene
- 1.3. Naphthalene
- 1.4. Chlorobenzene
- 1.5. 1,2-Dichloroethane
- 1.6. 1,1-Dichloroethane (upgradient source)
- 1.7. Ethyl benzene
- 1.8. Tetrachloroethane
- 1.9. Trichloroethene
- 1.10. Total Xylenes

2. Clean-up Objectives
- 2.1. Per the 1989 Record of Decision (ROD) "The ground water will be remediated by extraction, treatment, and reinjection to meet either Federal or State drinking water levels except in those cases where the upgradient concentrations are above such standards. In such a case, the contamination will be reduced to upgradient levels so as to eliminate any significant contribution from the SMS site."
- 2.2. The 1989 ROD expected the cleanup to be completed in four years of operation.

3. Soil Vapor Extraction System
- 3.1. Operated from April 1993 to September 1993
- 3.2. Treated approximately 1,250 cubic yards of soil (source area)

4. Groundwater Pump and Treat System
- 4.1. Began operation in 1994
- 4.2. Design and actual flow 90 gallons per minute (gpm)
- 4.3. Two extraction wells (EW-1 and EW-3) at 45 gpm each
- 4.4. 20 monitoring wells
- 4.5. Quarterly sampling conducted for metals, VOCs and semi-VOCs.
- 4.6. 7,300-gallon influent tank and pump
- 4.7. Sequestering agent addition
- 4.8. 50-foot tall packed tower air stripper
- 4.9. Vapor phase granular activated carbon adsorbers (two parallel lines with two (2), 2,000 pound adsorbers)
- 4.10. Glycol heat exchanger
- 4.11. All equipment installed outdoors. Insulation and heat tracing provided.
- 4.12. Discharge of treated groundwater to onsite infiltration basin (originally injection was the discharge location, however, the injection wells failed and were replaced with the infiltration basin)
- 4.13. System is monitored by telemetry (autodialer)

5. Current operating costs:
- 5.1. Chemical analysis currently done by EPA contract laboratory. Therefore no current project costs. Cost is estimated based on unit pricing and current analytical program.

TABLE 1
SUMMARY OF EXISTING ANNUAL COSTS

ITEM DESCRIPTION			
NO.	CATEGORY	DESCRIPTION	ESTIMATED CURRENT COST
1	Labor	Project management, technical support, reporting	$150,000
2	Labor	Plant operator – Full-time	$130,000
3	Labor	Groundwater monitoring	$36,000
4	Utilities	Electricity	$30,000
5	Non-utility	Granular activated carbon	
6	Non-utility	Chemicals and supplies for non-routine maintenance	$20,000
7	Waste Disposal		$1,000
8	Chemical Analysis	Estimated based on unit pricing	$45,000
	TOTAL		$423,000

6. Treatment facility currently removing an estimated 0.2 pounds per day of VOCs or 73 pounds per year. At 90 gpm and 90% operating time (estimated), the facility is treating about 42.57 million gallons per year.
7. The annualized costs are:
   7.1. $5,794 per pound of VOC removed
   7.2. $9.94 per 1,000 gallons treated

RSE RECOMMENDATIONS

The following paragraphs summarize the recommendations from the RSE and provide our evaluation of these recommendations. Details on each recommendation can be found in the RSE Report.

RECOMMENDATION:	6.1.1 IMPROVE REPORTING AND DATA ANALYSIS (INCLUDING EVALUATING PLUME CAPTURE)
Description:	1. Current quarterly reports do not include figures, water level data, and system operating data including flow rates mass removal, discharge quality and major maintenance. 2. Improve quarterly reports 3. Submit quarterly reports in timely manner
Reason:	Improve efficiency
Schedule:	Implement immediately
Capital Cost:	$5,000 – generate base maps and figures
Annual Costs:	$40,000 – $10,000 per quarterly report
MACTEC's REVIEW	
Evaluation:	1. We agree with the recommendation and the estimated costs; and support this recommendation
Additional Recommendations:	1. Given the size of this facility we recommend that reporting be revised from quarterly to semi-annual. This would result in an additional $20,000 per year savings. 2. Capture zone analysis may indicate lower pumping rate may achieve capture. This may support discontinuing vapor phase GAC. General guidance is that air emissions of less than 0.5 pounds per hour of VOCs do not require treatment.

RECOMMENDATION:	6.2.1 REDUCE OPERATOR AND PROJECT MANAGEMENT/TECHNICAL SUPPORT/REPORTING LABOR
Description:	1. The RSE report identified costs for project management labor, reporting labor and technical support labor to be $150,000 per year. 2. Operator Labor a. Reduce operator labor from 40 hours to an estimated 16 hours per week. b. Include 80 hours per year other maintenance activities 3. Reporting Labor a. See 6.1.1 4. Project Management Labor a. Estimate project management labor at $3,000 per month 5. Technical Support Labor a. Estimate technical support labor at 200 to 300 hours of senior staff per year at a cost of $30,000
Reason:	Cost Savings
Schedule:	Implement immediately
Capital Cost:	None
Annual Costs:	1. Operator Labor – reduce from $130,000 to $57,000 per year 2. Reporting Labor – see 6.1.1 3. Project Management Labor - $36,000 per year 4. Technical Support Labor - $30,000 per year
MACTEC's REVIEW	
Evaluation:	1. Operator Labor - We agree with the recommendation and estimated costs; and support this recommendation. System is monitored by telemetry (autodialer). 2. Reporting Labor – see 6.1.1 3. Project Management Labor –We agree with the recommendation. However, we believe that the project management costs are conservatively high. We believe a more realistic estimate is $1,500 per month or $18,000 per year. 4. Technical Support Labor – This level of effort and cost maybe appropriate for the first year or two of operation. However, this should not be a long-term annual cost.
Additional Recommendations:	1. Decrease level of effort and costs for project management. 2. Conduct annual reviews on technical support costs.

RECOMMENDATION: 6.2.2 OPTIMIZE MONITORING PROGRAM	
Description:	Sampling is performed quarterly on 2 extraction wells, treatment facility influent and effluent (2), and 20 monitoring wells for VOCs, semi-VOCs, and metals. 2. Eliminate analytical work for metals and semi-VOCs. 3. Revise sampling frequency of 7 monitoring wells to annual.
Reason:	Cost savings
Schedule:	Implement immediately
Capital Cost:	None
Annual Costs:	1 Current analytical is done by laboratory at no project costs. Existing analytical costs are estimated to be $45,000 per year. 2. Revising program will decrease estimated costs to $9,100 per year. 3 Current labor costs for sampling and monitoring are estimated at $36,000 per year. 4. Revising program will decrease estimated costs to $27,000 per year.

MACTEC's REVIEW	
Evaluation:	We agree with the recommendation and the estimated costs; and support this recommendation
Additional Recommendations:	Once trends are developed decrease sampling frequency to semi-annual. This would decrease costs by an additional 50%.

RECOMMENDATION:	6.2.3 CONSIDER DECREASING THE FREQUENCY OF VAPOR PHASE GAC REPLACEMENTS
Description:	1 The existing air stripper is currently removing an average of 0.2 pounds of VOCs per day. This is significantly lower than the design values estimated during the Remedial Investigation 2. Currently activated carbon is being replaced every 18 months without any testing.
Reason:	Cost savings
Schedule:	Implement immediately
Capital Cost:	None
Annual Costs:	1 By reducing the change out frequency to once every two to three years a savings of $3,000 to $5,000 per year can be achieved 2 There would be an unquantifiable savings in electrical costs with the elimination of the heat exchanger.

MACTEC's REVIEW	
Evaluation:	1 We agree with the recommendation and the estimated costs; and support this recommendation 2. Eliminate use of vapor phase GAC considering the low discharge.
Additional Recommendations:	Given the estimated 0.2 pounds per day of VOC discharge, eliminate the use of vapor phase carbon.

RECOMMENDATION: 6.4.1 DEVELOP AN EXIT STRATEGY

Description:	This recommendation consisted of three potential approaches for developing an exit strategy considering that the risks identified in the ROD are no longer present. The RSE considered: 1) continue the pump and treat system; 2) discontinue the pump and treat system to determine if contamination will migrate offsite above specified concentration; or 3) pilot an alternative technology and determine if either that technology or another approach should replace the pump and treat system. 2. The RSE recommended either Approach 2 or 3.
Reason:	Risks identified in ROD are no longer present.
Schedule:	Not identified
Capital Cost:	Approach 2 - $20,000 for developing exit strategy 2. Approach 3 - $145,000 for developing exit strategy and conducting pilot study.
Annual Costs:	Approach 2 - $100,000 per year 2. Approach 3 - $150,000 first year, $100,000 per year after

MACTEC's REVIEW

Evaluation:	Approach 2 – Discontinue pump and treat 1. Most cost-effective 2. RSE noted possible zone of stagnation between EW-1 and EW-3, discontinuing the pump and treat may allow this zone of contamination to move and erroneously lead to interpret high concentrations as a rebound. 3. Need to establish criteria for determining if and when to begin pumping again. 4. The estimated cost for developing exit strategy maybe low depending on the effort required to determine the reactivation criteria of the pump and treat system. Approach 3 – Replace pump and treat with alternate technology 1. Implement air sparging or using oxygen releasing compound (ORC) 2. Both technologies will require additional site characterization, although ORC would require less since it can injected over a wider area. For the air sparge system the extent of contamination needs to be defined more.
Additional Recommendations:	Approach 2 – Discontinue pump and treat 1. Aggressively pump EW-3 while decreasing pumping at EW-1 to eliminate zone of stagnation between the two wells.

SUMMARY

Given the scope of work and limited data on the operation of the existing system, we found the RSE to accurately identify the significant cost savings and improvements to the operation and performance of the pump and treat system. In general, there are substantial savings that can be achieved at this site if the system is required to continue to operate. These savings are presented on Table 2 which shows current annual costs, RSE recommended costs, and our cost estimates.

Of the RSE recommendations, the most important recommendation is the development of an exit strategy. As presented in the RSE, the risks identified in the ROD are no longer present. Furthermore, the monitoring data indicate that contaminants have reached asymptotic conditions. This supports the concept of discontinuing the pump and treat system or considering another technology or approach. The preferred option is discontinuing the pump and treat system. Prior to shutting down the system we suggest decreasing the pumping rate of EW-1 and increasing the pumping rate of EW-3 to decrease the influence of the stagnation zone on the concentrations of contaminants leaving the site.

We concur that the primary focus at this site should be the development of an exit strategy and discontinuing the pump and treat system. We estimate the initial cost of this effort to be approximately $20,000 to $35,000 in addition to long-term monitoring costs. During the development of the exit strategy, the pump and treat system should be adjusted to diminish the stagnation zone between EW-1 and EW-3. If the pump and treat system is to continue we concur with the recommendations of the RSE and we have provided additional recommendations for further cost savings.

Please feel free to contact us if you have any questions.

Sincerely,

Harding Lawson Associates

William J. Weber, P.E.
Program Manager

Randy E. Talbot, P.E.
Principal Engineer

TABLE 2
COMPARISION OF ANNUAL COSTS

ITEM DESCRIPTION			ESTIMATED CURRENT COST (1)	ESTIMATED COST BASED ON RSE RECOMMENDATIONS	ESTIMATED COST BASED ON ADDITIONAL RECOMMENDATIONS
NO.	CATEGORY	DESCRIPTION			
1	Labor	Project management, technical support, reporting	$150,000	$106,000 (4)	$68,000 (5)
2	Labor	Plant operator	$130,000	$57,000	$57,000
3	Labor	Groundwater monitoring	$36,000	$27,000	$13,500 (6)
4	Utilities	Electricity	$30,000	$30,000	$30,000 (7)
5	Non-utility	Granular activated carbon	$11,000	$7,000	$0
6	Non-utility	Chemicals and supplies for non-routine maintenance	$20,000	$20,000	$20,000
7	Waste Disposal		$1,000	$1,000	$1,000
8	Chemical Analysis		$45,000 (2)	$9,100 (3)	$9,100 (3)
	TOTAL		**$423,000**	**$257,100**	**$198,600**

Notes:

(1) Estimated cost from December 9, 2003 Remediation System Evaluation

(2) Currently done by contract laboratory at no cost to project, Estimated cost from December 9, 2003 Remediation System Evaluation

(3) Estimated cost from December 9, 2003 Remediation System Evaluation - Laboratory costs based on reduced sampling and analytical parameters
Change seven monitoring wells from quarterly to annual, eliminate SVOC and Metals from all sampling

(4) Based on:
- Quarterly report ($10,000 per report) = $40,000
- Project management ($3,000 per month) = $36,000
- Technical support (200 to 300 hours per year) = $30,000

(5) Based on:
- Semi-annual report ($10,000 per report) = $20,000
- Project management ($1,500 per month) = $18,000
- Technical support (200 to 300 hours per year) = $30,000

(6) Quarterly sampling to semi-annual sampling

(7) Does not include additional savings resulting from heat exchanger not operating