TABLE 1.1

SUMMARY OF TASKS FROM SCOPE OF WORK
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Task 1	-	Project Planning
Task 2	-	Community Relations
Task 3	-	Field Investigation
Task 4	-	Sample Analysis/Data Validation
Task 5	-	Data Evaluation
Task 6	-	Assessment of Risks
Task 7	-	Treatability Study/Pilot Testing
Task 8	-	Remedial Alternatives Screening
Task 9	-	Remedial Alternatives Evaluation
Task 10	-	RI/FS Reports

Source: RI/FS Work Plan
Dames and Moore
December 8, 1989

TABLE 1.2

SITE HISTORY
FORMER LAGOON SITE
TOWN OF HAMPTONBURGH, NEW YORK

Date		*Event*	*Description*
1952	October	Site purchased by Nepera Chemical Company, Inc.	Nepera Chemical is affiliated with the Pyridium Corporation.
1953	January	Permit to discharge wastes obtained Two (2) lagoons constructed	
1953 - 1967		Wastewater disposed at the Site in accordance with Permit	According to the report issued by Leggette, Brashears and Graham wastewater disposal averaged approximately 7,000 gallons a week.
1956		Construction of two (2) additional lagoons	
1963		Construction of two (2) final lagoons	
1967		Initial Investigation by Leggette, Brashears and Graham	Test wells T-1, T-2, and T-3 were constructed during the investigation and a report was issued to summarize the findings.
1968		Three (3) lagoons backfilled	Three (3) lagoons dried up upon discontinuance of disposal activities and fill materials were then placed into each as they dried.
1970's		Sporadic unauthorized dumping of domestic refuse	
1974		Remaining three (3) lagoons backfilled	
1980's		Several Investigations by the USEPA	
1983		Hydrogeological Investigation by Groundwater Technology	Monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and piezometers PZ-1, PZ-2 and PZ-3 were constructed during Site investigations.
1985		Site Investigation by C.A. Rich	Wells SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, SW-7, SW-8, SW-9, SW-10, DW-1 and DW-2 were constructed during investigations. Groundwater, surface water, soil and sediment samples were taken of the lagoons and surrounding area.
1986	March	Summary Report of Field Investigation Program completed by C.A. Rich	
1988	March	NYSDEC Stipulations Agreement	
1989	July	NYSDEC Comments received by Dames & Moore on RI/FS Draft Work Plan	
	December	Re-submission to RI/FS Work Plan to NYSDEC	
1990		Conditional approval of RI/FS Work Plan from NYSDEC	Nepera Inc. receives and accepts the conditions on the RI/FS Work Plan
1991	January	Submission of Data Management Plan, Health and Safety Plan, Site Operations Plan (SOP) and Quality Assurance Project Plan (QAPP) to NYSDEC by CRA	
	March	Submission of revised SOP and QAPP	
	March	Finalization of RI/FS Work Plan by Dames & Moore	
	April - Dec	RI Field Investigations	

TABLE 1.2

SITE HISTORY
FORMER LAGOON SITE
TOWN OF HAMPTONBURGH, NEW YORK

Date		*Event*	*Description*
1992	July	Submittal of RI Report	
1993	April	NYSDEC Comments on RI Report	NYSDEC requests additional field investigations and revisions to the RI.
	June	CRA Response to NYSDEC Comments on RI Report	
	July	NYSDEC reply to CRA response to comments	
	July	Submittal of Phase II RI Work Plan (Phase II WP)	Phase II WP submitted to address the additional field activities and revisions requested.
1994	June - Nov	Submittals/comments exchanged with NYSDEC	Multiple comments and responses were received and submitted on the Phase II WP and the RI Report.
	November	Submittal of Draft FS Report	FS report to be developed/submitted in three (3) phases.
1995	February	Re-submittal of Phase II RI WP	
	March	Meeting	
	March	NYSDEC Record of Understanding Letter	Letter regarding Phase II WP.
	April	NYSDEC Approval of Phase II WP	
	May - August	Phase II Field Investigations	Conversion of DW-1 and DW-2 to piezometers DW-1-95 and DW-2-95. Installation of -95 series monitoring wells. Groundwater, surface water, sediment and test pit soil samples taken from Site and surrounding area.
	May	NYSDEC request for submittal of Phase I FS Report	
	June	Submittal of Phase I FS Report	Initial screening of potentially available technologies.
	July	NYSDEC Letter outlining reasons for rejection of Phase I FS Report	
	July	Nepera/WLC Request that Phase I FS be reviewed by the NYSDEC	
	August	NYSDEC Comments on the Phase I FS Report	
	August	Response to NYSDEC Comments on the Phase I FS Report	
	August	Submittal of RI Report	
	September	Supplemental Response to NYSDEC Comments on the Phase I FS Report	
	October	NYSDEC Comments on the RI Report	
	October	Submittal of the Phase II FS Report	Selected media-specific response actions, technologies and process option retained were developed into complete alternatives.
	November	Response to NYSDEC Comments on the RI Report	
	December	NYSDEC Comments on the FS Report	NYSDEC requests a postponement in order to resolve certain key issues associated with the FS process.
1996	Jan - June	Ongoing Discussion with NYSDEC Re Issues and Treatability Study	NYSDEC, USEPA, and Nepera/WLC determine that a Treatability Study in support of soil vapor extraction (SVE) and biodegredation would be appropriate prior to the finalization of the FS Report.
	March	NYSDEC Approval of RI report	
	July	Submittal of SVE/Bioremediation Treatability Study Work Plan	
	August	NYSDEC Comments on the Treatability Study WP	
	September	Submittal of Final Treatability Study WP	
	November	NYSDEC Modifications Letter on Treatability Study WP	
	November	Field Activities for Treatability Study	
	December	NYSDEC Development of Interim Groundwater Monitoring Program	

TABLE 1.2

SITE HISTORY
FORMER LAGOON SITE
TOWN OF HAMPTONBURGH, NEW YORK

Date		*Event*	*Description*
1997	Jan - Sept	Treatability Study Submissions	Numerous interim submission to NYSDEC/USEPA
	February	First Semi-annual Interim Groundwater Monitoring Event	
	September	Submittal of Treatability Study Report	
	October	Submittal of FS Report	
1998	March	Meeting with USEPA	Meeting with John LaPadula to discuss RI/FS Issues
	May	Consent Decree filed in US District Court	Maybrook & Harriman Environmental Trust established to remediate the Maybrook Site.
	July	USEPA Position Letter	From John LaPadula regarding RI/FS Issues
	August	Response to USEPA Position Letter	
	December	Submittal of Additional Investigation Work Plan	Submitted to satisfy requests of USEPA Position Letter
	December	NYSDEC Comments on Additional Investigation WP	
1999	January	USEPA Comments on Additional Investigations WP	
	February	Response to NYSDEC/USEPA Comments on Additional Investigations WP	
	April	NYSDEC/USEPA Request and Comments	Request for separate OU-1 and OU-2 Work Plans
	April	Submittal of Revised OU-1 WP	
	May	NYSDEC/USEPA Comments of OU-1 WP	
	July	Submittal of Revised OU-1 WP	
	August	Submittal of Revised OU-2 WP	
	August	NYSDEC/USEPA Approval of OU-1 WP	
	September	Submittal of Revised OU-2 WP	
	November	Submittal of Supplemental Investigation (SI) Report for OU-1	
	November	Submittal of FS for OU-1	
	November	NYSDEC/USEPA Comments on Revised OU-2 WP	
2000	February	NYSDEC/USEPA Comments on SI Report and FS Report - OU-1	
	February	Meeting with NYSDEC	
	March	Letter of Understanding Submitted to NYSDEC/USEPA	Based on events from February 2000 Meeting.
	March	Response to NYSDEC/USEPA Comments on SI Report and FS Report - OU-1	
	June	NYSDEC/USEPA Comments on Letter of Understanding	
	October	Submittal of Revised SI Report for OU-1	
	December	Meeting with NYSDEC/USEPA	
	December	Action Items and Schedule Letter Submitted to NYSDEC/USEPA	
2001	January	Submittal of revised RAGs Part D Tables series 1 to 4	
	February	Submittal of revised OU-2 WP	
	March	Submittal of revised RAGs Part D Tables series 5 to 8	
		Submittal of revised RAGs Part D Tables series 9 to 10 and other assorted tables	
		Submittal of Proposed Cleanup Goals for Inorganics	
	May	NYSDEC/USEPA Approval of OU-2 WP	

TABLE 1.2

SITE HISTORY
FORMER LAGOON SITE
TOWN OF HAMPTONBURGH, NEW YORK

Date		*Event*	*Description*
	June - July	Field Activities for OU-2 WP	Installation of -01 series wells and conversions of four - 91 series wells from open corehole bedrock wells to screened interval wells. The installation of additional groundwater monitoring wells was requested by the U.S. EPA and the NYSDEC during a meeting on February 17, 2000 to further investigate the groundwater contaminant plume in the overburden and bedrock at the Site. Additional Round of Groundwater Sampling conducted including Natural Attenuation Sampling.
	July	NYSDEC / USEPA Comment on March 2001 submittal regarding cleanup goals for inorganics.	
2001	September	Submittal of supplemental information pertaining to pesticides	
	Oct - Nov	Miscellaneous correspondence from USEPA addressing a number of issues.	
2002	January	Submittal of Trust Response regarding comments of USEPA from October to November 2001.	
	March	Meeting with USEPA and NYSDEC	Trust agrees to perform additional inorganic characterization of the lagoons, mercury speciation, and background sampling.
	May	Submittal of Soil Sampling Workplan and Quality Assurance Project Plan for OU-1	
	June	Second Round of Natural Attenuation Sampling	Selected wells sampled as outlined in the OU-2 WP.
	July - Dec	Additional Submittals and Clarification of Soil Sampling Workplan and Quality Assurance Project Plan	
2003	February	USEPA Approval of Soil Sampling Workplan	
	May	Additional Soil Sampling	Samples taken from lagoons and offsite (background) for inorganics, pesticides and Mercury.
	May	USEPA Sediment Sampling of Beaverdam Brook	26 samples are collected by the USEPA
	November	Submittal of Natural Attenuation Study for OU-2	
		Submittal of Soil Sampling results from May 2003	
		Submittal of Sediment Data to Trust by USEPA	
2004	January	Meeting with USEPA/NYSDEC	Agreement to complete SI Report for OU-1 and OU-2 (combined).
		Preliminary USEPA Comments regarding Natural Attenuation Study for OU-2	
	February	Submittal of Cultural Resource Survey	
		Submittal of Wetland Delineation Study	
	March	Submittal of Evaluation of Mercury Speciation Results	
	June	USEPA Approval and Comments on Mercury Speciation Results	
		Submittal of Potential Treatment Alternatives Whitepaper	
		Re-submittal of Natural Attenuation Study	
	September	USEPA Comments on Natural Attenuation Study and Potential Treatment Alternatives Whitepaper	
2005	March	Submittal of New RI Report	
	June	USEPA comments on RI Report	
	September	Meeting with the USEPA	ERA revisions discussed
	November	Submittal of Revised RI Report	
2006	April	USEPA final comments on the RI Report and Conditional Approval Letter	
	June	Final RI Report submitted to agencies.	

TABLE 2.1

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SURFACE SOIL
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location: / *Sample Date:* / *Parameter*	*NYSDEC Soil Cleanup Objectives* (1)	*SSII-1* 06/02/1995	*SSII-2* 06/02/1995	*SSII-3* 06/02/1995	*SSII-4* 06/02/1995	*SSII-5* 06/02/1995	*SSII-6* 06/02/1995	*SSII-6* 06/02/1995 Duplicate	*SSII-7* 06/02/1995	*SSII-8* 06/02/1995
TCL Volatiles (ug/kg)										
Acetone	200	11U	**18**	11U	11U	**1J**	10U	**8J**	11U	11U
Benzene	60	11U	11U	11U	11U	11U	10UJ	11UJ	11UJ	11U
Chlorobenzene	1,700	11U	11UJ	11U	11UJ	11UJ	R	11UJ	11UJ	11U
Ethylbenzene	5,500	11U	11UJ	11U	11UJ	11UJ	R	11UJ	11UJ	11U
Toluene	1,500	11U	11UJ	11U	11UJ	11UJ	R	11UJ	11UJ	11U
Xylene (total)	1200	11U	11UJ	11U	11UJ	11UJ	R	11UJ	**2J**	11U
TCL Semi-Volatiles (ug/kg)										
2-Aminopyridine	400 (2)	350U	360U	360U	370U	360UJ	360U	3600U	360UJ	350UJ
2-Picoline	575 (2)	350U	360U	360U	370U	360U	360U	3600U	360U	350U
Aniline	1510	-	-	-	-	-	-	-	-	-
Pyridine	400 (2)	350U	360U	360U	370U	360U	360U	3600U	360U	350U

Notes:

[ ] - Exceeds NYSDEC Soil Cleanup Objective.
J - The reported value is an estimated quanitiy.
U - Non- detect at associated value.
UJ - The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
R - Value has been rejected.
-- - Parameter is not analysed.
TCL - Target Compound List
(1) - Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
(2) - Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.2

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SUBSURFACE SOIL
SUBSURFACE SOIL SAMPLING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

							Lagoon 1					
Sample Location:		*L-1*	*TP-11A*	*TP-12*	*TP-15*	*TP-46*	*TP-46*	*L1-TP1*	*L1-TP1*	*L1-TP3*	*L1-TP3*	*L1-TP3*
Sample Date:		*08/20/1985*	*07/09/1991*	*07/08/1991*	*07/08/1991*	*12/04/1991*	*12/04/1991*	*11/25/1996*	*11/25/1996*	*11/25/1996*	*11/25/1996*	*11/25/1996*
Sample Depth:		*[6-8]*	*[1-3]*	*[3-8]*	*[3-3]*	*[2-8]*	*[2-8]*	*[9-9]*	*[12-14]*	*[4-4]*	*[8-10]*	*[8-10]*
							Duplicate					*Duplicate*
Parameter	*NYSDEC Soil Cleanup Objective* [1]											
TCL Volatiles (ug/kg)												
Acetone	200	3	300J	450	110J	91	110	28J	11J	12U	19J	62J
Benzene	60	--	210	120	160J	330JD	300	3J	120	3J	160	190
Chlorobenzene	1,700	--	32	32	640	97	190	6J	17	12U	31J	41J
Ethylbenzene	5,500	--	4,000	500J	610J	890D	1,900	11U	75	12U	820	680
Toluene	1,500	2	26,000	1,200	1,100	1,000D	990	11U	4J	5J	87J	160J
Xylene (total)	1,200	4	4,500	2100	810	3,800D	7,700	3J	170	5J	1300	1100
TCL Semi-Volatiles (ug/kg)												
2-Aminopyridine	400 [2]	1U	R	260J	170J	240J	750	380UJ	2900J	390UJ	610J	720J
2-Picoline	575 [2]	1U	7,600J	89J	370U	750U	730U	380UJ	78J	180J	150J	210J
Aniline	1510	1U	--	--	--	--	--	--	--	--	--	--
Pyridine	400 [2]	6.24	3,300J	52J	370U	750U	730U	380UJ	380UJ	390UJ	160J	170J

Notes:

- Exceeds NYSDEC Soil Cleanup Objective.
J - Estimated.
U - Non- detect at associated value.
UJ - The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
R - Value has been rejected.
-- - Parameter is not analysed.
TCL - Target Compound List
(1) - Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
(2) - Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.2

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SUBSURFACE SOIL
SUBSURFACE SOIL SAMPLING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

		Lagoon 2				
Sample Location:		*L-2*	*L2-TP1*	*L2-TP1*	*L2-TP1*	*L2-TP2*
Sample Date:		*08/20/1985*	*11/26/1996*	*11/26/1996*	*11/26/1996*	*11/25/1996*
Sample Depth:		*[6.5-7]*	*[4-4]*	*[4-6]*	*[4-6]*	*[4-6]*
					Duplicate	
Parameter	*NYSDEC Soil Cleanup Objective* [1]					
TCL Volatiles (ug/kg)						
Acetone	200	1U	11U	**66J**	6600U	**39J**
Benzene	60	--	11U	**1200J**	**1300J**	**13000**
Chlorobenzene	1,700	--	11U	**5600J**	**3900J**	**12000**
Ethylbenzene	5,500	--	**3J**	**32000**	**22000**	**13000**
Toluene	1,500	**4**	11U	**7700**	**7700**	**7200**
Xylene (total)	1,200	**32**	**12**	**300000**	**240000**	**43000**
TCL Semi-Volatiles (ug/kg)						
2-Aminopyridine	400 [2]	**57**	380UJ	**19000J**	4400UJ	**2200J**
2-Picoline	575 [2]	1U	380UJ	4100UJ	4400UJ	380UJ
Aniline	1510	1U	--	--	--	--
Pyridine	400 [2]	**24.95**	380UJ	4100UJ	4400UJ	380UJ

Notes:

[ ] - Exceeds NYSDEC Soil Cleanup Objective.
J - Estimated.
U - Non- detect at associated value.
UJ - The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
R - Value has been rejected.
-- - Parameter is not analysed.
TCL - Target Compound List
(1) - Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
(2) - Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.2

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SUBSURFACE SOIL
SUBSURFACE SOIL SAMPLING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

		Lagoon 3								
Sample Location:		*L-3*	*TP-6*	*L3-TP1*	*L3-TP2*	*L3-TP2*	*L3-TP2*	*L3-TP3*	*L3-TP3*	*L3-TP3*
Sample Date:		*08/20/1985*	*07/10/1991*	*11/22/1996*	*11/22/1996*	*11/22/1996*	*11/22/1996*	*11/22/1996*	*11/22/1996*	*11/22/1996*
Sample Depth:		*[10-12]*	*[4-6]*	*[8-12]*	*[5-7]*	*[3-5]*	*[3-5]*	*[5-10]*	*[3-5]*	*[12-12]*
Parameter	*NYSDEC Soil Cleanup Objective* [1]									
TCL Volatiles (ug/kg)										
Acetone	200	1U	**240**	12U	**16J**	11U	12U	**90**	11U	**8J**
Benzene	60	--	6U	12U	11U	11U	12U	**67J**	11U	**17**
Chlorobenzene	1,700	--	**13**	12U	11U	11U	12U	**18**	11U	12U
Ethylbenzene	5,500	--	6U	12U	11U	11U	12U	**57**	11U	12U
Toluene	1,500	10	**410**	12U	11U	11U	**1J**	**7J**	11U	12U
Xylene (total)	1,200	1U	**39**	12U	11U	11U	12U	**200**	11U	**3J**
TCL Semi-Volatiles (ug/kg)										
2-Aminopyridine	400 [2]	1U	**720**	**12000J**	**74000**	380U	390U	**17000**	380UJ	**30000J**
2-Picoline	575 [2]	**3.4**	410U	390U	370UJ	380U	390U	**110J**	380UJ	390UJ
Aniline	1510	**2.9**	--	--	--	--	--	--	--	--
Pyridine	400 [2]	**8.44**	410U	390UJ	370UJ	380UJ	390UJ	440UJ	380UJ	390UJ

Notes:

- [ ] - Exceeds NYSDEC Soil Cleanup Objective.
J - Estimated.
U - Non- detect at associated value.
UJ - The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
R - Value has been rejected.
-- - Parameter is not analysed.
TCL - Target Compound List
(1) - Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
(2) - Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.2

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SUBSURFACE SOIL
SUBSURFACE SOIL SAMPLING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

		Lagoon 4										
Sample Location:		*L-4*	*TP-20/TP-29*	*TP-22/TP-26*	*TP-23/TP-24*	*TP-28*	*L4-TP1*	*L4-TP1*	*L4-TP1*	*L4-TP2*	*L4-TP2*	*L4-TP2*
Sample Date:		*08/20/1985*	*07/01/1991*	*07/02/1991*	*07/03/1991*	*06/28/1991*	*11/22/1996*	*11/22/1996*	*11/22/1996*	*11/21/1996*	*11/21/1996*	*11/21/1996*
Sample Depth:		*[12-15]*	*[5-7]*	*[6-7]*	*[5-7]*	*[3.5-3.5]*	*[2-4]*	*[4-6]*	*[4-6]* *Duplicate*	*[5-6]*	*[3-4]*	*[3-3]*
Parameter	*NYSDEC Soil Cleanup Objective* [1]											
TCL Volatiles (ug/kg)												
Acetone	200	1U	160	11U	63	**210**	**10J**	**140**	**100J**	**15**	**15**	11U
Benzene	60	–	22U	6U	6U	7U	11U	**6J**	**2J**	12U	12U	11U
Chlorobenzene	1,700	–	**58**	6U	6U	**24J**	11U	25UJ	**2J**	12U	12U	11U
Ethylbenzene	5,500	–	**130**	6U	6U	7UJ	11U	**4J**	12U	12U	12U	11U
Toluene	1,500	10	**63**	**120**	**25**	**94J**	11U	**15J**	**2J**	12U	12U	11U
Xylene (total)	1,200	1U	**1,200**	6U	6U	**1000E**	**3J**	**20J**	12U	12U	12U	11U
TCL Semi-Volatiles (ug/kg)												
2-Aminopyridine	400 [2]	1U	**260J**	**4,700J**	400U	**5,800J**	**11000J**	**99000J**	**82000J**	**4200J**	**390J**	370U
2-Picoline	575 [2]	1U	360U	390U	400U	400U	380U	410U	400U	390U	390U	370U
Aniline	1510	1U	–	–	–	–	–	–	–	–	–	–
Pyridine	400 [2]	**8.77**	360U	390U	400U	400U	380UJ	410UJ	400UJ	390UJ	390UJ	370UJ

Notes:

- Exceeds NYSDEC Soil Cleanup Objective.
J - Estimated.
U - Non- detect at associated value.
UJ - The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
R - Value has been rejected.
– - Parameter is not analysed.
TCL - Target Compound List
(1) - Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
(2) - Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.2

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SUBSURFACE SOIL
SUBSURFACE SOIL SAMPLING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

		Lagoon 5							Lagoon 6	
Sample Location:		*L-5*	*TP-2*	*TP-2*	*TP-4*	*L5-TP1*	*L5-TP2*	*L5-TP2*	*TP-41*	*L6-TP3*
Sample Date:		*08/20/1985*	*07/12/1991*	*07/12/1991*	*07/11/1991*	*11/21/1996*	*11/21/1996*	*11/21/1996*	*06/26/1991*	*11/21/1996*
Sample Depth:		*[14-14.5]*	*[5-7]*	*[5-7]*	*[5-6]*	*[5-6]*	*[4-6]*	*[2-4]*	*[1-1]*	*[3-3]*
				Duplicate						
Parameter	*NYSDEC Soil Cleanup Objective* [1]									
TCL Volatiles (ug/kg)										
Acetone	200	1U	**43J**	**31 J**	**55**	**20J**	**23J**	12U	11UJ	11U
Benzene	60	--	6U	6U	5U	**16J**	**190**	12U	6UJ	11U
Chlorobenzene	1,700	--	**77**	**72**	**760**	**280**	**6900**	**8J**	6UJ	11U
Ethylbenzene	5,500	--	6U	6U	**24**	**120**	**12000**	**9J**	6UJ	11U
Toluene	1,500	1U	**160J**	**330**	**2,200**	**87**	**52000**	**34**	**1,800J**	11U
Xylene (total)	1,200	1U	**7**	6U	**99**	**240**	**120000**	**72**	6UJ	11U
TCL Semi-Volatiles (ug/kg)										
2-Aminopyridine	400 [2]	1U	**350J**	**470J**	**570J**	**1800**	**1200**	400U	730U	370U
2-Picoline	575 [2]	1U	390U	750U	720U	780U	390U	400U	730U	370U
Aniline	1510	**134**	--	--	--	--	--	--	--	--
Pyridine	400 [2]	**6.1**	390U	750U	720U	780UJ	390UJ	400UJ	730U	370UJ

Notes:

- [ ] - Exceeds NYSDEC Soil Cleanup Objective.
J - Estimated.
U - Non- detect at associated value.
UJ - The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
R - Value has been rejected.
-- - Parameter is not analysed.
TCL - Target Compound List
(1) - Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
(2) - Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.2

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SUBSURFACE SOIL
SUBSURFACE SOIL SAMPLING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*BH-1-91*			*BH-3-91*	*BH-4-91*		*BH-5-91*			*MW-1D-91*	
Sample Date:		*EH30*	*EH31*	*EH32*	*EH43*	*EH33*	*EH34*	*EH36*	*EH37*	*EH38*	*RF01*	*RF02*
Sample Depth:		*06/25/1991*	*06/25/1991*	*06/25/1991*	*06/27/1991*	*06/25/1991*	*06/25/1991*	*06/25/1991*	*06/25/1991*	*06/25/1991*	*06/25/1991*	*06/25/1991*
		[0-2]	*[4-6]*	*[8-10]*	*[0-2]*	*[0-2]*	*[4-6]*	*[0-2]*	*[4-6]*	*[8-10]*	*[0-2]*	*[4-8]*
Parameter	*NYSDEC Soil Cleanup Objective* [1]											
TCL Volatiles (ug/kg)												
Acetone	200	12U	12U	13U	11U	12U	13U	12U	11U	12U	11U	10U
Benzene	60	6U	6U	7U	5U	6U	6U	6U	6U	6U	5U	5U
Chlorobenzene	1,700	6U	6U	**22**	5U	6U	6U	6U	6U	6U	5U	5U
Ethylbenzene	5,500	6U	6U	7U	5U	6U	6U	6U	6U	6U	5U	5U
Toluene	1,500	6U	6U	7U	5U	6U	6U	6U	6U	6U	5U	5U
Xylene (total)	1,200	6U	6U	7U	5U	6U	6U	6U	6U	6U	5U	5U
TCL Semi-Volatiles (ug/kg)												
2-Aminopyridine	400 [2]	360U	**390J**	**3600**	360U	370U	350U	370U	360U	**150J**	360U	340U
2-Picoline	575 [2]	360U	400U	410U	360U	370U	350U	370U	360U	400U	360U	340U
Aniline	1510	–	–	–	–	–	–	–	–	–	–	–
Pyridine	400 [2]	360U	400U	410U	360U	370U	350U	370U	360U	400U	360U	340U

Notes:

[ ]	- Exceeds NYSDEC Soil Cleanup Objective.
J	- Estimated.
U	- Non- detect at associated value.
UJ	- The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
R	- Value has been rejected.
–	- Parameter is not analysed.
TCL	- Target Compound List
(1)	- Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
(2)	- Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.2

EXCEEDANCES OF NYSDEC SOIL CLEANUP OBJECTIVES FOR COCs - SUBSURFACE SOIL
SUBSURFACE SOIL SAMPLING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*MW-1U-91*			*MW-2D-91*	*Curtain Drain*			
		RF06	*RF07*	*RF08*	*EH39*	*TP-49*	*TP-51*		*TP-52*
Sample Date:		*06/28/1991*	*06/28/1991*	*06/28/1991*	*06/25/1991*	*06/29/1995*	*06/29/1995*	*06/29/1995*	*06/29/1995*
Sample Depth:		*[0-2]*	*[8-10]*	*[8-10]* *Duplicate*	*[0-2]*	*[-]*	*[-]*	*[-]* *Duplicate*	*[-]*
Parameter	*NYSDEC Soil Cleanup Objective* [1]								
TCL Volatiles (ug/kg)									
Acetone	200	11U	11U	**19**	11U	12UJ	12UJ	12UJ	12UJ
Benzene	60	5U	5U	5U	5U	12U	12U	12U	12U
Chlorobenzene	1,700	5U	5U	5U	5U	12U	12U	12U	12U
Ethylbenzene	5,500	5U	5U	5U	5U	12U	12U	12U	12U
Toluene	1,500	5U	5U	5U	5U	12U	12U	12U	12U
Xylene (total)	1,200	5U	5U	5U	5U	12U	12U	12U	12U
TCL Semi-Volatiles (ug/kg)									
2-Aminopyridine	400 [2]	360U	**2,100J**	**3,500J**	360U	390U	400U	400U	380U
2-Picoline	575 [2]	360U	370U	360U	360U	390U	400U	400U	380U
Aniline	1510	--	--	--	--	--	--	--	--
Pyridine	400 [2]	360U	370U	360U	360U	390U	400U	400U	380U

Notes:

- ☐ - Exceeds NYSDEC Soil Cleanup Objective.
- J - Estimated.
- U - Non- detect at associated value.
- UJ - The analyte was detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
- R - Value has been rejected.
- -- - Parameter is not analysed.
- TCL - Target Compound List
- (1) - Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, HWR-94-4046, NYSDEC, January 24, 1994.
- (2) - Soil cleanup objective for the pyridine compounds determined by NYSDEC and USEPA in letter dated August 14, 1996.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*DW-1-95*		*DW-2-95*		*MW-1*		*MW-1D-91*		
Sample Date:		*07/09/2001*	*06/04/2002*	*07/10/2001*	*06/06/2002*	*07/05/2001*	*06/05/2002*	*07/10/2001*	*06/05/2002*	*06/05/2002 Duplicate*
Parameter	*Preliminary Remediation Goals* [1]									
TCL Volatiles (ug/L)										
1,2-Dichloroethane	0.6	1U	**1.3**	1U	1U	1U	1U	1U	1U	**1.4**
Acetone	50 (G)	**110J**	230UJ	**290J**	**640J**	**6J**	5UJ	R	5UJ	5UJ
Benzene	1	**130**	**100**	**11**	**13**	**0.7J**	1U	**67**	**91**	**94**
Chlorobenzene	5	**0.5J**	1U	1U	**0.6J**	1U	1U	**7.1**	**5.6**	**5.9**
Ethylbenzene	5	**2.6J**	**1**	1U	1U	1U	1U	1U	1U	1U
Toluene	5	**0.7J**	1.4U	**1J**	**2.1**	**4**	1U	1U	1U	1U
Xylene (total)	5	**1J**	**0.9J**	2U	**0.9J**	**4**	2U	2U	2U	2U
TCL Semi-volatiles (ug/L)										
2-Aminopyridine	1 (G)	10U	**10J**	10U	10U	10U	10U	**2J**	**3J**	**3J**
2-Picoline	50 [2] (G)	10U	10U	10U	10U	10U	10U	10U	10U	10U
Pyridine	50 (G)	10U	10UJ	10U	10U	10U	10U	10U	10U	10U
Semi-volatiles TICs										
Aniline A	5	--	--	--	--	--	--	--	--	--

Notes:

[ ] - Exceeds Preliminary Remediation Goals.
U - Not detected at associated detection limit.
J - Indicates an estimated value.
UJ - The analyte was detected above the sample quanitation limit. The reported quantitation limit is an estimated quantity.
R - Indicates the value has been rejected.
NJ - TIC was identified by name, at an estimated value.
-- - Parameter was not analyzed.
TCL - Target Compound List.
TIC - Tentatively Identified Compound
(1) - As defined in Section 10 of the Remedial Investigation Report.
(2) Alpha-picoline does not have a standard or guidance value. Due to lack of information for this analyte, pyridine was substituted as per the HHRA.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*MW-1U-91*			*MW-2*	*MW-2D-91*		*MW-3*	
Sample Date:		*07/10/2001*	*06/03/2002*	*06/03/2002 Duplicate*	*07/06/2001*	*07/10/2001*	*06/04/2002*	*07/10/2001*	*06/05/2002*
Parameter	*Preliminary Remediation Goals* [1]								
TCL Volatiles (ug/L)									
1,2-Dichloroethane	0.6	1U	**1.7**	**1.6**	1U	1U	1U	1U	1U
Acetone	50 (G)	R	5U	5U	R	R	5U	R	5UJ
Benzene	1	**190**	**170**	**170**	**96**	**59**	**90**	**96**	**110**
Chlorobenzene	5	**9.3**	**8.1**	**7.7**	**22**	**16**	**9.3**	**84**	**110**
Ethylbenzene	5	1UJ	1U	1U	**1**	**150**	**53**	**23J**	**22**
Toluene	5	1U	1U	1U	1U	**1.5**	1U	**1.2**	**1.2**
Xylene (total)	5	2U	2U	2U	**2**	**120**	**49**	**15**	**18**
TCL Semi-volatiles (ug/L)									
2-Aminopyridine	1 (G)	**20**	10UJ	**14J**	**520**	**5J**	10U	**5J**	**9J**
2-Picoline	50 [2] (G)	10U	10U	10U	**10**	10U	10U	10U	10U
Pyridine	50 (G)	10U	10UJ	10UJ	**3J**	10U	10U	10U	10U
Semi-volatiles TICs									
Aniline A	5	--	--	--	**12NJ**	--	--	--	--

Notes:

[ ]	- Exceeds Preliminary Remediation Goals.
U	- Not detected at associated detection limit.
J	- Indicates an estimated value.
UJ	- The analyte was detected above the sample qua
R	- Indicates the value has been rejected.
NJ	- TIC was identified by name, at an estimated val
--	- Parameter was not analyzed.
TCL	- Target Compound List.
TIC	- Tentatively Identified Compound
(1)	- As defined in Section 10 of the Remedial Investi
(2)	Alpha-picoline does not have a standard or gui substituted as per the HHRA.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*MW-3D-91*			*MW-4*		*MW-4D-91*		*MW-5D-95*	
Sample Date:		*07/09/2001*	*07/09/2001 Duplicate*	*06/03/2002*	*07/10/2001*	*06/05/2002*	*07/09/2001*	*06/04/2002*	*07/05/2001*	*06/04/2002*
Parameter	*Preliminary Remediation Goals* [1]									
TCL Volatiles (ug/L)										
1,2-Dichloroethane	0.6	1U	1U	1U	1U	**1.5**	1U	1U	1U	1U
Acetone	50 (G)	R	R	5U	**16J**	**37J**	R	5U	**9J**	5U
Benzene	1	1U	1U	1U	**27**	**72**	1U	1U	**0.6J**	1U
Chlorobenzene	5	1U	1U	1U	**2.2**	**4.6**	1U	1U	1U	1U
Ethylbenzene	5	1UJ	1UJ	1U	1UJ	1U	1UJ	1U	1U	1U
Toluene	5	1U	1U	1U	1U	1U	1U	1U	**12**	1U
Xylene (total)	5	2U	2U	2U	2U	2U	2U	2U	**5**	**1J**
TCL Semi-volatiles (ug/L)										
2-Aminopyridine	1 (G)	10U	10U	10UJ	**3J**	10U	10U	10UJ	10U	10U
2-Picoline	50 [2] (G)	10U	10U	10U	10U	10U	10U	10U	10U	10U
Pyridine	50 (G)	10U	10U	10UJ	10U	10U	10U	10UJ	10U	10U
Semi-volatiles TICs										
Aniline A	5	–	–	–	–	–	–	–	–	–

Notes:

[ ]	- Exceeds Preliminary Remediation Goals.
U	- Not detected at associated detection limit.
J	- Indicates an estimated value.
UJ	- The analyte was detected above the sample qua
R	- Indicates the value has been rejected.
NJ	- TIC was identified by name, at an estimated val
–	- Parameter was not analyzed.
TCL	- Target Compound List.
TIC	- Tentatively Identified Compound
(1)	- As defined in Section 10 of the Remedial Investi
(2)	Alpha-picoline does not have a standard or gui substituted as per the HHRA.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*MW-5U-95*			*MW-6D-95*		*MW-7*		
Sample Date:		*07/05/2001*	*07/05/2001 Duplicate*	*06/03/2002*	*07/09/2001*	*06/03/2002*	*07/10/2001*	*07/10/2001 Duplicate*	*06/04/2002*
Parameter	*Preliminary Remediation Goals* [1]								
TCL Volatiles (ug/L)									
1,2-Dichloroethane	0.6	1U	1U	1U	1U	1U	1U	1U	**4.3**
Acetone	50 (G)	R	R	5U	**22J**	5U	R	R	5U
Benzene	1	1U	1U	1U	1U	1U	**1100**	**940**	**790**
Chlorobenzene	5	1U	1U	1U	1U	1U	**23**	**23**	**14**
Ethylbenzene	5	1U	1U	1U	1UJ	1U	**150**	**130**	**70**
Toluene	5	**2**	**2**	1U	1U	1U	**23**	**23**	**19**
Xylene (total)	5	2U	2U	2U	2U	2U	**520**	**450**	**210**
TCL Semi-volatiles (ug/L)									
2-Aminopyridine	1 (G)	10U	10U	10UJ	10U	10UJ	**94**	**130**	**300**
2-Picoline	50 [2] (G)	10U	10U	10U	10U	10U	**14**	**14**	**28**
Pyridine	50 (G)	10U	10U	10UJ	10U	10UJ	**8J**	**8J**	**15J**
Semi-volatiles TICs									
Aniline A	5	--	--	--	--	--	**16NJ**	**9.2NJ**	--

Notes:

[ ] - Exceeds Preliminary Remediation Goals.
U - Not detected at associated detection limit.
J - Indicates an estimated value.
UJ - The analyte was detected above the sample qua
R - Indicates the value has been rejected.
NJ - TIC was identified by name, at an estimated val
-- - Parameter was not analyzed.
TCL - Target Compound List.
TIC - Tentatively Identified Compound
(1) - As defined in Section 10 of the Remedial Investi
(2) Alpha-picoline does not have a standard or gui substituted as per the HHRA.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*MW-8U-95*		*MW-9D-01*		*MW-9U-01*		*MW-10D-01*	*MW-10U-01*
Sample Date:		*07/05/2001*	*06/03/2002*	*07/07/2001*	*06/05/2002*	*07/07/2001*	*06/05/2002*	*07/06/2001*	*07/06/2001*
Parameter	*Preliminary Remediation Goals* [1]								
TCL Volatiles (ug/L)									
1,2-Dichloroethane	0.6	1U	1U	1U	1U	1U	1U	1U	1U
Acetone	50 (G)	R	5U	R	5UJ	R	5UJ	R	R
Benzene	1	**1**	**40**	**0.7J**	1U	1U	1U	1U	1U
Chlorobenzene	5	1U	**1**	1U	1U	1U	1U	1U	1U
Ethylbenzene	5	1U	**0.7J**	1UJ	1U	1U	1U	1U	1U
Toluene	5	**0.6J**	1U	**1.5**	1U	1U	1U	1U	1U
Xylene (total)	5	2U	**1J**	2U	2U	2U	2U	2U	2U
TCL Semi-volatiles (ug/L)									
2-Aminopyridine	1 (G)	**2J**	10UJ	10U	-	10U	-	10U	10U
2-Picoline	50 [2] (G)	10U	10U	10U	-	10U	-	10U	10U
Pyridine	50 (G)	10U	10UJ	10U	-	10U	-	10U	10U
Semi-volatiles TICs									
Aniline A	5	--	--	--	--	--	--	--	--

Notes:

- Exceeds Preliminary Remediation Goals.
U - Not detected at associated detection limit.
J - Indicates an estimated value.
UJ - The analyte was detected above the sample qua
R - Indicates the value has been rejected.
NJ - TIC was identified by name, at an estimated val
-- - Parameter was not analyzed.
TCL - Target Compound List.
TIC - Tentatively Identified Compound
(1) - As defined in Section 10 of the Remedial Investi
(2) Alpha-picoline does not have a standard or gui substituted as per the HHRA.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*MW-11D-01*	*MW-11U-01*		*MW-12D-01*	*MW-13D-01*	*SW-2*		*SW-3*
Sample Date:		*07/06/2001*	*07/06/2001*	*07/06/2001 Duplicate*	*07/06/2001*	*07/06/2001*	*07/10/2001*	*06/06/2002*	*07/06/2001*
Parameter	*Preliminary Remediation Goals* [1]								
TCL Volatiles (ug/L)									
1,2-Dichloroethane	0.6	1U	1U	1U	1U	1U	1U	**1.6**	1U
Acetone	50 (G)	R	R	R	R	R	R	5UJ	R
Benzene	1	1U	1U	1U	1U	1U	**55**	**55**	**18**
Chlorobenzene	5	1U	1U	1U	1U	1U	**14**	**8.6**	**2**
Ethylbenzene	5	1U	1U	1U	1U	1U	**1.1J**	**0.7J**	1U
Toluene	5	1U	1U	1U	1U	**1**	**0.5J**	**0.7J**	**1**
Xylene (total)	5	2U	2U	2U	2U	2U	**1J**	**1J**	2U
TCL Semi-volatiles (ug/L)									
2-Aminopyridine	1 (G)	10U	10U	10U	10U	10U	**8J**	**42**	**1J**
2-Picoline	50 [2] (G)	10U	10U	10U	10U	10U	10U	10U	10U
Pyridine	50 (G)	10U	10U	10U	10U	10U	10U	10U	10U
Semi-volatiles TICs									
Aniline A	5	--	--	--	--	--	--	--	--

Notes:

[ ]	-	Exceeds Preliminary Remediation Goals.
U	-	Not detected at associated detection limit.
J	-	Indicates an estimated value.
UJ	-	The analyte was detected above the sample qua
R	-	Indicates the value has been rejected.
NJ	-	TIC was identified by name, at an estimated val
--	-	Parameter was not analyzed.
TCL	-	Target Compound List.
TIC	-	Tentatively Identified Compound
(1)	-	As defined in Section 10 of the Remedial Investi
(2)		Alpha-picoline does not have a standard or gui substituted as per the HHRA.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*SW-4*		*SW-6*	*SW-7*		*SW-8*	*SW-9*	
Sample Date:		*07/10/2001*	*06/04/2002*	*06/05/2002*	*07/09/2001*	*06/04/2002*	*07/06/2001*	*07/09/2001*	*06/04/2002*
Parameter	*Preliminary Remediation Goals* [1]								
TCL Volatiles (ug/L)									
1,2-Dichloroethane	0.6	1U	1U	1U	1U	1U	1U	1U	1U
Acetone	50 (G)	R	5U	5UJ	R	5U	R	R	5U
Benzene	1	**37**	**2.8**	**25**	1U	1U	**63**	**1.5**	1U
Chlorobenzene	5	1U	1U	**1.4**	1U	1U	1U	1U	1U
Ethylbenzene	5	**25**	**1.4**	1U	1UJ	1U	1U	1U	1U
Toluene	5	**3.7**	1U	1U	1U	1U	1U	1U	1U
Xylene (total)	5	**45**	**3.2**	2U	2U	2U	2U	2U	2U
TCL Semi-volatiles (ug/L)									
2-Aminopyridine	1 (G)	**41**	**5J**	**3J**	10U	10UJ	**26**	10U	10UJ
2-Picoline	50 [2] (G)	**5J**	10U	10U	10U	10U	10U	10U	10U
Pyridine	50 (G)	10U	10U	10U	10U	10UJ	10U	10U	10UJ
Semi-volatiles TICs									
Aniline A	5	--	--	--	--	--	--	--	--

Notes:

[ ] - Exceeds Preliminary Remediation Goals.
U - Not detected at associated detection limit.
J - Indicates an estimated value.
UJ - The analyte was detected above the sample qua
R - Indicates the value has been rejected.
NJ - TIC was identified by name, at an estimated val
-- - Parameter was not analyzed.
TCL - Target Compound List.
TIC - Tentatively Identified Compound
(1) - As defined in Section 10 of the Remedial Investi
(2) Alpha-picoline does not have a standard or gui substituted as per the HHRA.

TABLE 2.3

EXCEEDANCES OF PRELIMINARY REMEDIATION GOALS FOR COCs - GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Sample Location:		*SW-10*	*T-2*		*T-3*	
Sample Date:		*06/04/2002*	*07/05/2001*	*06/05/2002*	*07/05/2001*	*06/05/2002*
Parameter	*Preliminary Remediation Goals* [1]					
TCL Volatiles (ug/L)						
1,2-Dichloroethane	0.6	1U	1U	1U	1U	1U
Acetone	50 (G)	5U	R	5UJ	R	5UJ
Benzene	1	1U	1U	1U	1U	1U
Chlorobenzene	5	1U	1U	1U	1U	1U
Ethylbenzene	5	1U	1U	1U	1U	1U
Toluene	5	1.5U	1	1U	1U	1U
Xylene (total)	5	2	2U	2U	2U	2U
TCL Semi-volatiles (ug/L)						
2-Aminopyridine	1 (G)	10U	10U	10U	10U	10U
2-Picoline	50 [2] (G)	10U	10U	10U	10U	10U
Pyridine	50 (G)	10U	10U	10U	10U	10U
Semi-volatiles TICs						
Aniline A	5	--	--	--	--	--

Notes:

[ ] - Exceeds Preliminary Remediation Goals.
U - Not detected at associated detection limit.
J - Indicates an estimated value.
UJ - The analyte was detected above the sample qua
R - Indicates the value has been rejected.
NJ - TIC was identified by name, at an estimated val
-- - Parameter was not analyzed.
TCL - Target Compound List.
TIC - Tentatively Identified Compound
(1) - As defined in Section 10 of the Remedial Investi
(2) Alpha-picoline does not have a standard or gui substituted as per the HHRA.

TABLE 2.4

SUMMARY OF CALCULATED ADDITIONAL LIFETIME CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

Media/Exposure Scenarios	*Present/Future*		*Lifetime Cancer Risks* CT	*Lifetime Cancer Risks* RME	*Non-Carcinogenic Hazard Index* CT	*Non-Carcinogenic Hazard Index* RME
I. Surface Soils/Surface Soils TICs						
a) Trespassers/Hikers	Present	TCL/TAL	8.80E-08	1.90E-07	1.10E-02	2.20E-02
		TICs	NC	NC	7.80E-06	1.60E-05
		Total	8.80E-08	1.90E-07	1.10E-02	2.20E-02
		Lagoon 6 TCL/TAL	5.30E-07	1.20E-06	3.80E-02	8.90E-02
		Lagoon 6 TICs	NC	NC	3.50E-04	6.90E-04
		Total	5.30E-07	1.20E-06	3.84E-02	8.97E-02
b) Parkland Users	Future					
Child		TCL/TAL	2.80E-07	6.60E-07	4.30E-02	9.20E-02
		TICs	NC	NC	3.00E-05	5.90E-05
		Total	2.80E-07	6.60E-07	4.30E-02	9.21E-02
Adult		TCL/TAL	2.50E-08	9.00E-07	8.40E-03	1.80E-02
		TICs	NC	NC	5.90E-06	1.20E-05
		Total	2.50E-08	9.00E-07	8.41E-03	1.80E-02
Child+Adult		TCL/TAL	3.05E-07	1.56E-06		
		TICs	NC	NC		
		Total	3.05E-07	1.56E-06		
Child		Lagoon 6 TCL/TAL	1.80E-06	6.40E-06	2.50E-01	9.70E-01
		Lagoon 6 TICs	NC	NC	1.30E-03	2.60E-03
		Total	1.80E-06	6.40E-06	2.51E-01	9.73E-01
Adult		Lagoon 6 TCL/TAL	1.60E-07	6.40E-06	4.20E-02	2.50E-01
		Lagoon 6 TICs	NC	NC	2.60E-04	5.20E-04
		Total	1.60E-07	6.40E-06	4.23E-02	2.51E-01
Child+Adult		Lagoon 6 TCL/TAL	1.96E-06	1.28E-05		
		Lagoon 6 TICs	NC	NC		
		Total	1.96E-06	1.28E-05		
c) Maintenance Worker	Future	TCL/TAL	9.10E-07	3.70E-06	1.20E-01	1.30E-01
		TICs	NC	NC	8.70E-05	8.70E-05
		Total	9.10E-07	3.70E-06	1.20E-01	1.30E-01
		Lagoon 6 TCL/TAL	5.50E-06	2.40E-05	4.50E-01	8.10E-01
		Lagoon 6 TICs	NC	NC	3.80E-03	3.80E-03
		Total	5.50E-06	2.40E-05	4.54E-01	8.14E-01

TABLE 2.4

SUMMARY OF CALCULATED ADDITIONAL LIFETIME CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

Media/Exposure Scenarios	*Present/Future*		*Lifetime Cancer Risks* CT	*Lifetime Cancer Risks* RME	*Non-Carcinogenic Hazard Index* CT	*Non-Carcinogenic Hazard Index* RME
d) Resident	Future					
Child		TCL/TAL	1.70E-05	1.80E-05	3.40E+00	3.40E+00
		TICs	NC	NC	2.40E-03	2.40E-03
		Total	1.70E-05	1.80E-05	3.40E+00	3.40E+00
Adult		TCL/TAL	9.30E-07	8.50E-06	3.80E-01	3.90E-01
		TICs	NC	NC	2.70E-04	2.70E-04
		Total	9.30E-07	8.50E-06	3.80E-01	3.90E-01
Child+Adult		TCL/TAL	1.79E-05	2.65E-05		
		TICs	NC	NC		
		Total	1.79E-05	2.65E-05		
Child		Lagoon 6 TCL/TAL	1.00E-04	1.10E-04	1.20E+01	1.40E+01
		Lagoon 6 TICs	NC	NC	1.10E-01	1.10E-01
		Total	1.00E-04	1.10E-04	1.21E+01	1.41E+01
Adult		Lagoon 6 TCL/TAL	5.60E-06	5.30E-05	1.40E+00	1.70E+00
		Lagoon 6 TICs	NC	NC	1.20E-02	1.20E-02
		Total	5.60E-06	5.30E-05	1.41E+00	1.71E+00
Child+Adult		Lagoon 6 TCL/TAL	1.06E-04	1.63E-04		
		Lagoon 6 TICs	NC	NC		
		Total	1.06E-04	1.63E-04		
II. Soils/Soils TICs						
a) Construction Worker	Future	TCL/TAL	5.00E-05	1.50E-04	4.10E+01	1.20E+02
		TICs	NC	NC	1.20E-02	3.70E-02
		Total	5.00E-05	1.50E-04	4.10E+01	1.20E+02
		Lagoon 6 TCL/TAL	8.60E-07	2.70E-06	1.60E+00	4.80E+00
		Lagoon 6 TICs	NC	NC	3.30E-03	1.00E-02
		Total	8.60E-07	2.70E-06	1.60E+00	4.81E+00
III. Sediments/Sediment TICs						
1. Northeast Marsh						
a) Occasional Visitors/Hikers	Present/Future	TCL/TAL	4.00E-08	8.60E-08	3.50E-02	7.10E-02
2. Southwest Marsh Area						
a) Trespassers/Hikers	Present	TCL/TAL	8.00E-07	1.40E-06	2.00E-01	3.00E-01
b) Recreational Users	Future					
Child		TCL/TAL	2.20E-06	3.70E-06	8.70E-01	1.30E+00
Adult		TCL/TAL	1.20E-07	1.80E-06	9.90E-02	1.50E-01
Child+Adult		TCL/TAL	2.32E-06	5.50E-06		

TABLE 2.4

SUMMARY OF CALCULATED ADDITIONAL LIFETIME CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

Media/Exposure Scenarios	*Present/Future*		*Lifetime Cancer Risks* CT	*Lifetime Cancer Risks* RME	*Non-Carcinogenic Hazard Index* CT	*Non-Carcinogenic Hazard Index* RME
IV. Surface Water/Surface Water TICs						
1. Northeast Marsh						
a) Occasional Visitors/Hikers	Present/Future	TCL/TAL	7.20E-10	2.90E-09	3.30E-04	1.30E-03
2. Beaverdam Brook						
a) Trespassers/Hikers	Present	TCL/TAL	6.70E-09	1.20E-08	1.00E-02	3.00E-02
b) Recreational Users	Future					
Child		TCL/TAL	7.80E-09	2.40E-08	2.00E-02	5.90E-02
Adult		TCL/TAL	1.00E-09	2.40E-08	5.00E-03	1.50E-02
Child+Adult		TCL/TAL	8.80E-09	4.80E-08		
3. Otter Kill						
a) Trespassers/Hikers	Present	TCL/TAL	1.10E-08	3.40E-08	5.80E-03	1.70E-02
b) Recreational Users	Future					
Child		TCL/TAL	1.30E-08	3.90E-08	1.10E-02	3.40E-02
Adult		TCL/TAL	1.70E-09	4.00E-08	2.90E-03	8.70E-03
Child + Adult		TCL/TAL	1.47E-08	7.90E-08		
b) Recreational Anglers	Future					
Child		TCL/TAL	2.10E-05	1.10E-04	2.00E+00	1.10E+01
		TICs	NC	NC	6.00E-04	3.20E-03
		Total	2.10E-05	1.10E-04	2.00E+00	1.10E+01
Adult		TCL/TAL	7.30E-06	3.10E-04	1.40E+00	7.40E+00
		TICs	NC	NC	4.10E-04	2.20E-03
		Total	7.30E-06	3.10E-04	1.40E+00	7.40E+00
Child + Adult		TCL/TAL	2.83E-05	4.20E-04		
		TICs	NC	NC		
		Total	2.83E-05	4.20E-04		
V. Groundwater/Groundwater TICs						
1. Off-Site Groundwater						
a) Resident	Future					
Child		TCL/TAL	NC	NC	3.20E+00	4.60E+00
Adult		TCL/TAL	NC	NC	1.50E+00	2.10E+00
Child + Adult		TCL/TAL	NC	NC		

TABLE 2.4

SUMMARY OF CALCULATED ADDITIONAL LIFETIME CANCER RISKS
AND NON-CARCINOGENIC HAZARD INDICES
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Media/Exposure Scenarios	*Present/Future*		*Lifetime Cancer Risks*		*Non-Carcinogenic Hazard Index*	
			CT	*RME*	*CT*	*RME*
2. On Site Wells						
a) Resident	Future					
Child		TCL/TAL	3.60E-04	5.40E-04	4.20E+02	6.10E+02
		TICs	NC	NC	5.10E+01	7.50E+01
		Total	3.60E-04	5.40E-04	4.71E+02	6.85E+02
Adult		TCL/TAL	7.40E-05	8.20E-04	1.90E+02	2.80E+02
		TICs	NC	NC	2.20E+01	3.20E+01
		Total	7.40E-05	8.20E-04	2.12E+02	3.12E+02
Child + Adult		TCL/TAL	4.34E-04	1.36E-03		
		TICs	NC	NC		
		Total	4.34E-04	1.36E-03		
b) Construction Worker	Future	TCL/TAL	2.80E-07	1.40E-06	1.40E-01	7.20E-01
		TICs	NC	NC	1.70E-03	1.00E-02
		Total	4.95E-03	1.25E-02	1.42E-01	7.30E-01

Notes:

TCL = Target Compound List
TAL = Target Analyte List
TICs = Tentatively Identified Compounds
NC = Not Calculated

TABLE 4.1

POTENTIAL ACTION-SPECIFIC ARARs
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Activity	*FEDERAL ARARs*			*New York State ARARs*		
	Title	*Subtitle*	*Citation*	*Title*	*Subtitle*	*Citation*
Capping	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Closure and post-closure care Post-closure care and use of property	40 CFR 264.310 40 CFR 264.117(c)	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
				Final status standards for owners and operators of hazardous waste treatment, storage and disposal facilities	–	6 NYCRR Subpart 373-2
Container Storage	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Condition of containers Compatibility of waste with containers Management of containers Inspections Containment	40 CFR 264.171 40 CFR 264.172 40 CFR 264.173 40 CFR 264.174 40 CFR 264.175	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
Constuction of New Landfill on Site	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements Operation and maintenance Closure and post-closure care Groundwater protection	40 CFR 264.301 40 CFR 264.303-304 40 CFR 264.310 40 CFR 264.91-100	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
Discharge of Treatment System Effluent	Administered permit programs: The national pollutant discharge elimination system	Establishing limitations, standards and other permit conditions	40 CFR 122.44 and State regulations approved under 40 CFR 131	Implementation of NPDES program in New York State	–	6 NYCRR Part 750-757
				Technical and Operations Guidance Series	–	–
				Blending policy for use of sources of drinking water	–	NYSDOH PWS 68
	Criteria and standards for the national pollutant discharge elimination program	Best management practices Discharge to waters of the U.S.	40 CFR 125.100 40 CFR 125.104	Drinking water supplies Use and protection of waters	– –	Part 5 of State Sanitary Code 6 NYCRR Part 608
	Guidelines establishing test procedures for the analysis of pollutants	Identification of test procedures and alternate test procedures	40 CFR 136.1-4		–	6 NYCRR Part 702-703
	Effluent guidelines and standards	–	–	Water Quality Regulations for Surface Waters and Groundwaters		
Excavation	Land disposal restrictions (also see Closure)	Treatment standards	40 CFR 268 (Subpart D)	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
Incineration Off Site	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Waste analysis	40 CFR 264.341			
Land Treatment	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Treatment program Design and operating requirements Unsaturated zone monitoring Special requirements for ignitable or reactive waste	40 CFR 264.271 40 CFR 264.273 40 CFR 264.278 40 CFR 264.281	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
				New York air pollution control regulations	General provisions	6 NYCRR Part 200
					Permits and certificates	6 NYCRR Part 201
					General prohibitions	6 NYCRR Part 211
					General process emission sources	6 NYCRR Part 212
Placement of Waste in Land Disposal Unit	Land disposal restrictions	Treatment standards	40 CFR 268 (Subpart D)	Land disposal restrictions	–	6 NYCRR Part 376
				Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1

TABLE 4.1

POTENTIAL ACTION-SPECIFIC ARARs
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

	FEDERAL ARARs			*New York State ARARs*		
Activity	*Title*	*Subtitle*	*Citation*	*Title*	*Subtitle*	*Citation*
Surface Water Control	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements for waste piles	40 CFR 264.251(c),(d)	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1 6 NYCRR Part 701 and Part 703
		Design and operating requirements for land treatment	40 CFR 264.273(c),(d)			
		Design and operating requirements for landfills	40 CFR 264.301(c),(d)			
Treatment (in a unit)	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements for waste piles	40 CFR 264.251	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
		Design and operating requirements for thermal treatment units	40 CFR 265.373	Interim status standards for owners and operators of hazardous waste facilities	–	6 NYCRR Subpart 373-3
		Design and operating requirements for miscellaneous treatment units	40 CFR 264.601	New York air pollution control regulations	General provisions Permits and certificates General prohibitions General process emission sources	6 NYCRR Part 200 6 NYCRR Part 201 6 NYCRR Part 211 6 NYCRR Part 212
Treatment (when waste will be land disposed)	Land disposal restrictions	Identification of waste Treatment Standards Waste Specific prohibitions - Solvent wastes	40 CFR 268.10-12 40 CFR 268 (Subpart D) 40 CFR 268.30 RCRA Sections 3004 (d) (3), (e) (3) 42 USC 6924 (d) (3), (e) (3)	Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
				Interim status standards for owners and operators of hazardous waste facilities	– –	6 NYCRR Subpart 373-3 6 NYCRR Part 376
				Land disposal restrictions		
Waste Pile	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements	40 CFR 264.251	New York air pollution control regulations	General provisions Permits and certificates General prohibitions General process emission sources	6 NYCRR Part 200 6 NYCRR Part 201 6 NYCRR Part 211 6 NYCRR Part 212
				Hazardous waste treatment, storage and disposal facility permitting requirements	–	6 NYCRR Subpart 373-1
				Interim status standards for owners and operators of hazardous waste facilities	–	6 NYCRR Subpart 373-3
Closure with Waste in Place	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Closure and post-closure care	40 CFR 264.258			
		Post-closure care and groundwater monitoring	40 CFR 264.310			
Closure of Land Treatment Units	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Closure of land treatment units	40 CFR 264.280	Final status standards for owners and operators of hazardous waste facilities	–	6 NYCRR Subpart 373-2
Transporting Hazardous Waste Off Site	Standards applicable to transporters of hazardous waste	–	40 CFR 263	Waste transport permits	–	5 NYCRR Part 364
				Hazardous waste manifest system and related standards for generators, transporters and facilities	–	6 NYCRR Part 372

TABLE 4.2

IDENTIFICATION OF POTENTIAL GENERAL REMEDIAL RESPONSE ACTIONS, TECHNOLOGIES AND PROCESS OPTIONS - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technologies*	*Process Options*
1. No Action	--	--
2. Limited Action	a) Institutional Controls	i) Restricted Site Access and Limit Future Land Use
3. Physical Containment Action	a) Capping	i) Soil Cap Meeting Standards for a Sanitary Landfill ii) RCRA Cap
	b) Chemical Fixation/Stabilization In-place	i) Chemical ii) Physical
	c) Surface Water Runoff Diversion	i) Site Grading ii) Ditches or Berms
4. In Situ Treatment	a) Biological	i) Biological ii) Bioventing
	b) Physical	i) Vacuum Extraction ii) Soil Flushing

TABLE 4.2

IDENTIFICATION OF POTENTIAL GENERAL REMEDIAL RESPONSE ACTIONS, TECHNOLOGIES AND PROCESS OPTIONS - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technologies*	*Process Options*
5. Removal/Treatment Action	a) On-Site Physical	i) Vacuum Extraction ii) Low Temperature Thermal iii) Mobile Incineration
	b) On-Site Chemical	i) Solvent Extraction ii) Soil Washing
	c) On-Site Biological	i) Biological
	d) Off-Site Physical	i) Incineration
6. Removal/Disposal Action	a) Off-Site Disposal	i) Landfilling - Hazardous Waste Disposal Site - Non-Hazardous Waste Disposal Site
7. On-Site Consolidation Action	--	--

TABLE 4.3

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technology/Process Option*	*Screening Comments*	*Recommendations*
1. No Action	---	- required by the NCP - will not change existing conditions - soils with concentrations exceeding NYSDEC Soil Cleanup Objectives will remain at the Site.	- retained for further evaluation
2. Limited Action	a) Restricted Access and Institutional Controls	- will minimize potential future contact with chemicals in soils - soils with concentrations exceeding NYSDEC Soil Cleanup Objectives will remain at the Site.	- retained for further evaluation
3. Physical Containment Action	a) Capping	- will minimize potential contact with chemicals in surface soil (dermal contact and air pathways) - reduce infiltration and hence chemical loading to the groundwater - soils with concentrations exceeding NYSDEC Soil Cleanup Objectives will remain at the Site.	- retained for further evaluation
	b) Chemical Fixation/Stabilization In-place	- will reduce mobility of some chemicals in soils - not suitable for some chemicals in soil - expensive and difficult to implement - benefits obtained do not warrant the high cost of this relatively unreliable technology.	- eliminated from further evaluation

TABLE 4.3

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technology/Process Option*	*Screening Comments*	*Recommendations*
3. Physical Containment Action (cont'd)	c) Surface Water Runoff Diversion	- will minimize potential contact of surface water runoff with chemicals associated with surface soils.	- retained for further evaluation
4. In situ Treatment	a) Biological - Biological Treatment	- will reduce concentrations of chemicals - will decrease time required to potentially obtain groundwater ARARs. - technically feasible but may be difficult to implement - less effective than bioventing	- retained for further evaluation
	- Bioventing	- will reduce concentrations of chemicals - will decrease time required to potentially obtain groundwater ARARs - technically feasible - readily implemented with vacuum extraction - more effective than simple biological treatment	- retained for further evaluation

TABLE 4.3

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technology/Process Option*	*Screening Comments*	*Recommendations*
4. In situ Treatment (cont'd)	b) Physical - Vacuum Extraction	- will reduce concentrations of chemicals in soils - effective primarily for VOCs and to a lesser extent SVOCs - will decrease time required to potentially obtain groundwater ARARs - technically feasible - requires vapor phase treatment - effective for all compounds when used in conjunction with bioventing	- retained for further evaluation
	- Soil Flushing	- technically feasible but may be difficult to implement - requires hydraulic control - possible contamination due to surfactants if used - treatment of extracted water/ surfactant required - not effective for low mobility compounds	- retained for further evaluation
5. Removal/Treatment Action	a) On-Site Biological	- technically feasible - may be difficult to implement due to regulatory restrictions concerning on-Site treatment - potential for significant chemical emissions during excavating/ handling/treatment	- retained for further evaluation

TABLE 4.3

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technology/Process Option*	*Screening Comments*	*Recommendations*
5. Removal/Treatment Action (cont'd)	b) On-Site Physical		
	- Vacuum Extraction	- technically feasible - may be difficult to implement due to regulatory restrictions concerning on-Site treatment - potential for significant air emissions during excavating/ handling - effective for VOCs and to a lesser extent SVOCs	- retained for further evaluation
	- Low Temperature Thermal Desorption	- technically feasible - may require treatment of off-gas - effective for Site-related chemicals - potential for significant air emissions during excavation/ handling	- retained for further evaluation
	- Incineration	- technically feasible but may be difficult to implement due to community perception - effective for Site-related chemicals - trial burns may delay implementation by approximately two years - potential for significant air emissions during excavation/ handling	- retained for further evaluation

TABLE 4.3

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technology/Process Option*	*Screening Comments*	*Recommendations*
5. Removal/Treatment Action (cont'd)	c) On-Site Chemical - Solvent Extraction	- technically feasible - reliability and effectiveness of solvent extraction is questionable - potential for significant air emissions during excavation/ handling	- retained for further evaluation
	d) Off-Site Incineration	- technically feasible - effective for Site-related chemicals - potential for significant air emissions during excavation/ handling/transportation of soils - limited available capacity at off-Site incinerators - not cost effective	- retained for further evaluation
6. Disposal Action	a) Off-Site Disposal	- will remove soils from the Site with chemical concentrations exceeding NYSDEC Soil Cleanup Objectives - decrease time required to potentially obtain groundwater ARARs - potential for significant chemical emissions during excavation/ handling of soils - pretreatment may be required to comply with land ban provisions - very expensive for large volume	- retained for further evaluation

TABLE 4.3

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - SOILS FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technology/Process Option*	*Screening Comments*	*Recommendations*
6. Disposal Action (cont'd)	a) Off-Site Disposal	of soils requiring potential disposal	
7. On-Site Consolidation	--	- increase effectiveness and efficiency of other remedial response actions	- retained for further evaluation

TABLE 4.4

SUMMARY OF CAP EFFECTIVENESS
FOR REDUCING PERCOLATION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

	RCRA Cap	*Soil/Clay Cap*
Total Precipitation	42.92	42.92
Average Annual Runoff	1.86	7.74
Average Annual Evaporation	31.60	33.24
Average Lateral Drainage	9.29	0.00
Average Annual Percolation	0.01	2.03
Change in Water Storage	0.17	-0.08

Notes:

1) Based upon HELP Model results presented in Appendix B.
2) Model results are for a five-year simulation period.

TABLE 4.5

SOIL REMEDIAL RESPONSE ACTIONS, TECHNOLOGIES AND PROCESS OPTIONS RETAINED FOR FURTHER EVALUATION FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

	General Response Actions[1]		*Remedial Technologies*		*Process Options*
1.	No Action		--		--
2.	Limited Action	a)	Institutional Controls	i) ii)	deed restrictions land use zoning changes
3.	Physical Containment Action	a)	Capping (includes consolidation)	i)	RCRA Cap
		b)	Surface Water Runoff Diversion		--
4.	In Situ Treatment	a)	Physical	i)	Soil Vacuum Extraction/Bioventing
5.	Removal/Treatment Action	a)	On-Site Physical	i)	Soil Vacuum Extraction/Biological
6.	Disposal Action	a)	Off-Site Disposal	i)	Landfilling – Hazardous Waste Disposal Site - Non-hazardous Waste Disposal Site

Note:

(1) Monitoring and institutional controls are considered effective components of Site-wide remedial alternatives. Consolidation/stormwater management will be utilized as required.

TABLE 4.6

IDENTIFICATION OF POTENTIAL GENERAL REMEDIAL RESPONSE ACTIONS, TECHNOLOGIES AND PROCESS OPTIONS - GROUNDWATER FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technologies*	*Process Options*
1. No Action	--	--
2. Limited Action	a) Institutional Controls	i) Restricted Future Groundwater Use
3. In Situ Treatment Action	a) Biological	i) Monitored Natural Attenuation i) Enhanced Bioremediation ii) Biosparging
4. Physical Containment Action	a) Barrier Wall	i) Soil/Bentonite ii) Cement/Bentonite iii) Sheet Piling
5. Hydraulic Containment Action	a) Groundwater Extraction Wells	--
	b) Groundwater Collection Drains	--
6. Source Removal Action	a) Groundwater Extraction Wells	--
7. Collection/Treatment Action	a) Physical Treatment	i) Carbon Adsorption ii) Air Stripping iii) Aeration
	b) Chemical Treatment	i) UV/Oxidation
	c) On-Site Biological Treatment	i) Biological
	d) Off-Site Treatment	i) POTW ii) RCRA Facility
8. Collection/Disposal Action	a) Discharge to Beaverdam Brook	--
	b) Groundwater Injection	--
	c) Disposal at POTW	--

TABLE 4.7

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - GROUNDWATER FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

	General Response Actions		*Remedial Technologies*	*Comments*	*Recommendations*
1.	No Action		---	- will not change existing conditions	- retained for further evaluation
2.	Limited Action	a)	Institutional Controls	- will restrict potential use of groundwater at the Site to non-potable uses - groundwater concentrations will continue to exceed ARARs beneath the Site	- retained for further evaluation
3.	Physical Containment Action	a)	Barrier Wall	- effectiveness at the Site would be minimal as the water table tile collection system would provide adequate overburden groundwater containment	- eliminated from further evaluation
4.	Hydraulic Containment Action	a)	Groundwater Extraction Wells	- will prevent off-Site migration of chemicals via groundwater flow - would require many wells at a very small spacing for overburden due to thin saturated thickness - would be effective for bedrock	- eliminated (overburden) - retained (bedrock)
		b)	Groundwater Collection Tile Drains	- will prevent off-Site migration of chemicals via groundwater flow in the overburden	- retained for further evaluation

TABLE 4.7

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - GROUNDWATER FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technologies*	*Comments*	*Recommendations*
5. Source Removal Action	a) Groundwater Extraction Wells	- will remove groundwater from isolated source areas with high concentrations - cleanup time would not be significantly reduced compared to hydraulic containment	- eliminated from further evaluation
6. Removal/Treatment Action	a) Physical Treatment	- will reduce concentrations of chemicals in groundwater - decrease time required to potentially obtain groundwater ARARs	- retained for further evaluation
	b) Chemical Treatment	- will reduce concentrations of chemicals in groundwater - decrease time required to potentially obtain groundwater ARARs	- retained for further evaluation
	c) On-Site Biological Treatment	- will reduce concentrations of chemicals in groundwater - decrease time required to potentially obtain groundwater ARARs	- retained for further evaluation

TABLE 4.7

SCREENING OF REMEDIAL RESPONSE ACTIONS AND TECHNOLOGIES - GROUNDWATER FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions	*Remedial Technologies*	*Comments*	*Recommendations*
	d) Off-Site Treatment	- will reduce concentrations of chemicals in groundwater - decrease time required to potentially obtain groundwater ARARs	- retained for further evaluation
7. Collection/Disposal Action	a) Discharge to Beaverdam Brook	- potentially applicable - pretreatment may be required prior to discharge	- retained for further evaluation
	b) Groundwater Injection	- not appropriate as soil flushing and in situ biological treatment are not retained	- eliminated from further evaluation
	c) Disposal at POTW	- potentially applicable - extracted groundwater treated and disposed at POTW	- eliminated from further evaluation
8. In-Situ Treatment Action	a) Biological	- will reduce chemical concentration in the groundwater - decrease time required to potentially obtain groundwater ARARs - may not be effective for treatment of bedrock groundwater	- retained for further evaluation

TABLE 4.8

GROUNDWATER REMEDIAL RESPONSE ACTIONS, TECHNOLOGIES AND PROCESS OPTIONS RETAINED FOR FURTHER EVALUATION FORMER LAGOON SITE HAMPTONBURGH, NEW YORK

General Response Actions		*Remedial Technologies*		*Process Options*	
1.	No Action	--		--	
2.	Limited Action	a)	Institutional Controls	i) ii)	deed restrictions land use zoning changes
3.	In Situ Treatement Action	a)	Biological	i) ii) iii)	Monitored Natural Attenuation Enhanced Bioremediation Biosparging
4.	Hydraulic Containment	a)	Groundwater Collection Overburden - Tile Drains Bedrock - Extraction Wells		--
5.	Removal/Treatment Action	a)	On-Site Physical Treatment	i) ii) iii)	UV oxidation Air Stripping Carbon adsorption
6.	Collection/Disposal Action	a)	Discharge to Beaverdam Brook		--

TABLE 5.1

LIST OF REMEDIAL ALTERNATIVES FOR SOIL
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Alternative	*Description*
1.	No Action
2.	Institutional Controls
3.	Capping
4.	Excavation/On-Site Biocell
5.	In Situ Vacuum Extraction
6.	Excavation/Off-Site Disposal

TABLE 5.2

DETAILED ANALYSIS CRITERIA AND FACTORS
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Evaluation Criteria	*Evaluation Factors*
Overall Protection of Human Health and the Environment	• elimination, reduction or control of risks
Compliance with ARARs	• compliance with chemical specific ARARs • compliance with action specific ARARs • compliance with location specific ARARs
Short-Term Impacts and Effectiveness	• protection of human health and environment during implementation • time required to achieve remedial objectives • protection of workers during remedial actions
Long-Term Effectiveness and Permanence	• permanence of remedial alternatives • magnitude of residual risk • adequacy of controls imposed after remedial action • reliability of controls imposed after remedial action
Reduction of Toxicity, Mobility and Volume	• amount of hazardous material destroyed or treated • degree of expected reduction in toxicity, mobility or volume • degree to which treatment is irreversible • type and quantity of residuals remaining after treatment
Implementability	• technical feasibility • administrative feasibility • availability of services and materials
Cost	• total capital costs • operation and maintenance costs • total present worth cost

TABLE 5.3

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 1 - NO ACTION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
	There are no capital costs associated with this alternative.				
Annual Operation and Maintenance Costs					
1.	Site Evaluation ($5,000 every 5 years)	--	L.S.	--	$ 901
	Estimated Annual Operation and Maintenance Cost				$ 901
	Contingency (5%)				$ 45
	Total Estimated Annual Operation and Maintenance Cost				$ 950
Total Present Worth					
	Capital Cost				$ -
	Site Evaluation (discount factor of 5.2% every 5 years for 30 years)				$ 14,222
	Total Present Worth [(1)]				$ 15,000

Notes:
(1) Total Costs have been rounded to three significant figures.

TABLE 5.4

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 2 - INSTITUTIONAL CONTROLS
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Institutional Controls a) Deed restrictions	--	L.S.	--	$ 12,000
	Estimated Capital Cost				$ 12,000
	Contingency (5%)				$ 600
	Total Estimated Capital Cost				$ 12,600
Annual Operation and Maintenance Costs					
1.	Site Evaluation ($5,000 every 5 years)	--	L.S.	--	$ 901
2.	Site Maintenance	--	L.S.	--	$ 12,000
	Estimated Annual Operation and Maintenance Cost				$ 12,901
	Contingency (5%)				$ 645
	Total Estimated Annual Operation and Maintenance Cost				$ 13,550
Total Present Worth					
	Capital Cost				$ 12,600
	Site Evaluation (discount factor of 5.2% every 5 years for 30 years)				$ 14,222
	Site Maintenance (discount factor of 5.2% for 30 years)				$ 189,354
	Total Present Worth [1]				$ 217,000

Notes:
(1) Total Costs have been rounded to three significant figures.

TABLE 5.5

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 3 - CAPPING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Institutional Controls a) Deed restrictions	--	L.S.	--	$ 12,000
2.	Site Preparation	--	L.S.	--	$ 50,000
3.	Health and Safety	14	weeks	$ 2,500	$ 35,000
4.	Capping of Remediation Zone a) clearing, grubbing, grading b) RCRA cap	178,500 198,300	sq ft sq ft	$ 0.4 to $ 0.6 $ 6.0 to $ 8.0	$ 71,400 to $ 107,100 $ 1,189,800 to $ 1,586,400
				Item 2 Subtotal	$ 1,261,200 $ 1,693,500
5.	Surface Water Runoff Diversions	1,710	ft	$ 10	$ 17,100
				Estimated Capital Cost	$ 1,375,300 to $ 1,807,600
				Engineering (15%)	$ 206,295 $ 271,140
				Subtotal	$ 1,581,595 $ 2,078,740
				Contingency (10%)	$ 158,160 $ 207,874
				Total Estimated Capital Cost	$ 1,739,755 to $ 2,286,614
Annual Operation and Maintenance Costs					
1.	Site Evaluation ($10,000 every 5 years)	--	L.S.	--	$ 1,803
2.	Site Maintenance (fence and cap)	--	L.S.	--	$ 20,000
				Estimated Annual Operation and Maintenance Cost	$ 21,803
				Contingency (10%)	$ 2,180
				Total Estimated Annual Operation and Maintenance Cost	$ 24,000
Total Present Worth					
	Capital Cost				$ 1,739,755 to $ 2,286,614
	Site Evaluation (discount factor of 5.2% every 5 years for 30 years)				$ 29,798
	Site Maintenance (discount factor of 5.2% for 30 years)				$ 330,618
				Total Present Worth [1]	$ 2,100,000 to $ 2,647,000

Notes:
(1) Total Costs have been rounded to three significant figures.

TABLE 5.6

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 4 - EXCAVATION / ON-SITE BIOCELL
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Site Preperation	--	L.S.	--	$ 80,000 to $ 120,000
2	Biocell Vacuum Extraction/Bioremediation Soil Treatment System				
	a) Materials and Equipment	--	L.S.	--	$ 200,000
	b) Equipment Building	--	L.S.	--	$ 30,000 to $ 50,000
	c) Utilities	--	L.S.	--	$ 30,000
				Item 2 Subtotal	$ 260,000 to $ 280,000
3.	Material Handling (includes Health and Safety)				
	a) Excavate, segregate, and stockpile upper clean soil	21,690	C.Y.	$ 6 to $ 8	$ 130,140 to $ 173,520
	b) Excavation of soil potentially exceeding cleanup criteria	35,120	C.Y.	$ 8 to $ 12	$ 280,960 to $ 421,440
	c) Screening, amendment, and conditioning of soil to be treated	26,370 to 40,543	C.Y.	$ 5 to $ 10	$ 131,850 to $ 405,425
	d) Placement of soil to be treated in biocell	21,120 to 32,458	C.Y.	$ 4 to $ 6	$ 84,480 to $ 194,748
	e) Backfill, compact and grade clean soil, cobbles and shale	24,352 to 35,690	C.Y.	$ 5 to $ 7	$ 121,760 to $ 249,830
				Item 3 Subtotal	$ 749,190 $ 1,444,963
4.	Soil Sampling				
	a) Segregation Sampling of upper clean material (VOCs and pyridines)	145	ea.	$ 600	$ 87,000
	b) Confirmatory Soil Sampling during excavation (VOCs and pyridines)	70	ea.	$ 600	$ 42,000
				Item 4 Subtotal	$ 129,000
				Estimated Capital Cost	$ 1,218,190 to $ 1,973,963
				Engineering (10%)	$ 121,819 to $ 197,396
				Subtotal	$ 1,340,009 to $ 2,171,359
				Contingency (10%)	$ 134,001 to $ 217,136
				Total Estimated Capital Cost	$ 1,474,010 to $ 2,388,495
Annual Operation and Maintenance Costs					
1.	Soil Treatment Plant Operation [1]				
	a) Electrical Power Consumption	--	L.S.	--	$ 50,000
	b) Maintenance (equipment and labor)				
	Year 1 (SVE and Biocell)	--	L.S.	--	$ 80,000
	Year 2 (Biocell only)	--	L.S.	--	$ 40,000
				Item 1 Subtotal	$ 90,000 to $ 130,000
2.	Biocell Treatment System Monitoring [1] (Collection and analysis of samples for TCL VOCs, SVOCs and SSPL parameters)				
	Year 1 (Startup, SVE and Biocell)	--	L.S.	--	$ 150,000
	Year 2 (Air Monitoring Bi-Weekly, Primarily biocell)	--	L.S.	--	$ 60,000
				Item 2 Subtotal	$ 60,000 to $ 150,000
3.	Verification Sampling (60 Soil sampled analyzed for TCL VOCs, SVOCs and SSPL parameters)	60	ea.	$ 950	$ 57,000
4.	Remedy Completion Report ($20,000 in Year 3)	--	L.S.	--	$ 20,000
5.	Site Maintenance	--	L.S.	--	$ 12,000
				Estimated Annual Operation and Maintenance Cost	$ 219,000 to $ 369,000
				Contingency (10%)	$ 21,900 to $ 36,900
				Total Estimated Annual Operation and Maintenance Cost	$ 241,000 to $ 406,000

TABLE 5.6

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 4 - EXCAVATION / ON-SITE BIOCELL
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Total Present Worth					
	Capital Cost				$ 1,474,010 to $ 2,388,495
	Biocell/Treatment Plant Operation, Maintenance, Monitoring and Verification Sampling[1] (discount factor of 5.2% for 1 to 2 years)				$ 216,445 to $ 687,335
	Remedy Completion Report (discount factor of 5.2% at 3 years)				$ 18,896
	Site Maintenance (discount factor of 5.2% for 2 years)				$ 24,475
				Total Present Worth [2]	$ 1,734,000 to $ 3,119,000

Notes:
(1) Treatment operations and monitoring is for a 1 to 2 year period.
(2) Total Costs have been rounded to three significant figures.

TABLE 5.7

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 5 - IN SITU SOIL VAPOR EXTRACTION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Site Preperation	--	L.S.	--	$ 50,000
2.	In Situ Vacuum Extraction / Bioremediation				
	a) Pilot study	--	L.S.	--	$ 100,000
	b) Collection Trench System and Equipment	--	L.S.	--	$ 288,000 to $ 360,000
	c) Barrier Cap	--	L.S.	--	$ 150,000 to $ 200,000
	d) Equipment Building	--	L.S.	--	$ 100,000 to $ 120,000
	e) Well Installation	--	L.S.	--	$ 132,000 to $ 154,000
				Item 1 Subtotal	$ 770,000 to $ 934,000
3.	Surface Water Runoff Diversions	1710	ft	$ 10	$ 17,100
				Estimated Capital Cost	$ 837,100 to $ 1,001,100
				Engineering (10%)	$ 83,710 to $ 100,110
				Subtotal	$ 920,810 to $ 1,101,210
				Contingency (10%)	$ 92,081 to $ 110,121
				Total Estimated Capital Cost	$ 1,012,891 to $ 1,211,331
Annual Operation and Maintenance Costs					
1.	Soil Treatment Plant Operation [1]				
	a) Electrical Power Consumption	--	L.S.	--	$ 100,000
	b) Maintenance (equipment and labor)				
	Year 1	--	L.S.	--	$ 80,000
	Years 2 to 4	--	L.S.	--	$ 40,000
				Item 1 Subtotal	$ 140,000 to $ 180,000
2.	Soil Treatment System Monitoring [1]				
	(Collection and analysis of influent and effluent gas samples for TCL VOCs, SVOCs and SSPL parameters)				
	Year 1	--	L.S.	--	$ 150,000
	Years 2 to 4	--	L.S.	--	$ 60,000
				Item 2 Subtotal	$ 60,000 to $ 150,000
3.	Verification Sampling (60 Soil sampled analyzed for TCL VOCs, SVOCs and SSPL parameters; $57,000 at end of 4 years)	--	L.S.	--	$ 57,000
4.	Remedy Completion Report ($20,000 in Year 5)	--	L.S.	--	$ 20,000
5.	Site Maintenance	--	L.S.	--	$ 12,000
				Estimated Annual Operation and Maintenance Cost	$ 212,000 to $ 419,000
				Contingency (10%)	$ 21,200 to $ 41,900
				Total Estimated Annual Operation and Maintenance Cost	$ 233,200 to $ 460,900

TABLE 5.7

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 5 - IN SITU SOIL VAPOR EXTRACTION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Total Present Worth					
	Capital Cost				$ 1,012,891 to $ 1,211,331
	Soil Treatment Plant Operation, Maintenance, Monitoring and Verification Sampling[1] (discount factor of 5.2% for 4 years)				$ 1,027,287
	Remedy Completion Report (discount factor of 5.2% at 5 years)				$ 17,074
	Site Maintenance (discount factor of 5.2% for 4 years)				$ 46,590
	Total Present Worth [2]				$ 2,104,000 to $ 2,302,000

Notes:
(1) Treatment operations and monitoring is for 4 years.
(2) Total Costs have been rounded to three significant figures.

TABLE 5.8

COST ESTIMATE FOR SOIL
REMEDIAL ALTERNATIVE 6 - EXCAVATION / OFF-SITE DISPOSAL
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Site Preparation	--	L.S.	--	$ 80,000 to $ 120,000
2.	Material Handling (includes Health and Safety)				
	a) Excavate, segregate, and stockpile upper clean soil	21,690	C.Y.	$ 6 to $ 8	$ 130,140 to $ 173,520
	b) Excavation of soil potentially exceeding cleanup criteria	35,120	C.Y.	$ 8 to $ 12	$ 280,960 to $ 421,440
	c) Screening of soil to be disposed	26,370 to 40,543	C.Y.	$ 5 to $ 10	$ 131,850 to $ 405,425
	d) Transportation and off-Site disposal (non-hazardous)	32,314 to 55,504	Ton	$ 112	$ 3,619,168 to $ 6,216,448
	e) Transportation and off-Site disposal (hazardous)	1,900 to 8,764	Ton	$ 215	$ 408,500 to $ 1,884,260
	f) Backfill, compact and grade clean soil, cobbles and shale	24,352 to 35,690	C.Y.	$ 5 to $ 7	$ 121,760 to $ 249,830
	g) Backfill, compact and grade imported fill	21,120 to 32,458	C.Y.	$ 10 to $ 12	$ 211,200 to $ 389,496
			Item 2 Subtotal		$ 4,903,578 to $ 9,740,419
3.	Soil Sampling				
	a) Segregation Sampling of upper clean material (VOCs and pyridines)	145	ea.	$ 600	$ 87,000
	b) Confirmatory Soil Sampling during excavation (VOCs and pyridines)	70	ea.	$ 600	$ 42,000
			Item 3 Subtotal		$ 129,000
			Estimated Capital Cost		$ 5,112,578 to $ 9,989,419
			Engineering (2%)		$ 102,252 to $ 199,788
			Subtotal		$ 5,214,830 to $ 10,189,207
			Contingency (10%)		$ 521,483 to $ 1,018,921
			Total Estimated Capital Cost		$ 5,736,313 to $ 11,208,128
Annual Operation and Maintenance Costs					
1.	Remedy Completion Report ($20,000 in Year 2)	--	L.S.	--	$ 20,000
			Estimated Annual Operation and Maintenance Cost		$ 20,000
			Contingency (10%)		$ 2,000
			Total Estimated Annual Operation and Maintenance Cost		$ 22,000
Total Present Worth					
	Capital Cost				$ 5,736,313 to $ 11,208,128
	Remedy Completion Report (discount factor of 5.2% at Year 2)				$ 19,879
				Total Present Worth [1]	$ 5,756,000 to $ 11,228,000

Notes:
(1) Total Costs have been rounded to three significant figures.

TABLE 6.1

LIST OF REMEDIAL ALTERNATIVES FOR GROUNDWATER
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Alternative	*Description*
1.	No Action
2.	Monitored Natural Attenuation
3.	Pump and Treat
4.	Enhanced Bioremediation
5.	Biosparging

TABLE 6.2

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 1 - NO ACTION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
	There are no capital costs associated with this alternative.				
Annual Operation and Maintenance Costs					
1.	Site Evaluation ($5,000 every 5 years)	--	L.S.	--	$ 901
	Estimated Annual Operation and Maintenance Cost				$ 901
	Contingency (5%)				$ 45
	Total Estimated Annual Operation and Maintenance Cost				$ 950
Total Present Worth					
	Capital Cost				$ -
	Site Evaluation (discount factor of 5.2% every 5 years for 30 years)				$ 14,222
	Total Present Worth [(1)]				$ 15,000

Notes:
(1) Total Costs have been rounded to three significant figures.

TABLE 6.3

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 2 - MONITORED NATURAL ATTENUATION
WITH CONTINGENCIES
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1. Institutional Controls					
a) Deed restrictions		--	L.S.	--	$ 12,000
	Estimated Capital Cost				$ 12,000
	Contingency (10%)				$ 1,200
	Total Estimated Capital Cost				$ 13,200

					Low End [1]	High End [2]
Annual Operation and Maintenance Costs						
1. Groundwater Monitoring						
	Year 1	--	L.S.	--	$ 80,000	$ 80,000
	Year 2	--	L.S.	--	$ 40,000	$ 40,000
	Years 3 to 5	--	L.S.	--	$ 15,000	$ 15,000
	Years 6 to 10	--	L.S.	--	$ 10,000	$ 15,000
	Years 11 to 30	--	L.S.	--	$ -	$ 15,000
2. Annual Monitoring Report						
	Year 1	--	L.S.	--	$ 15,000	$ 15,000
	Year 2	--	L.S.	--	$ 10,000	$ 10,000
	Years 3 to 5	--	L.S.	--	$ 5,000	$ 5,000
	Years 6 to 10	--	L.S.	--	$ 3,000	$ 5,000
	Years 11 to 30	--	L.S.	--	$ -	$ 5,000
3. Site Evaluation						
	First 5 Year review	--	L.S.	--	$ 25,000	$ 25,000
	Subsequent 5 year reviews	--	L.S.	--	$ 10,000	$ 10,000
4. Site Maintenance		--	L.S.	--	$ 2,000	$ 2,000
	Estimated Annual Operation and Maintenance Cost				$ 15,000 to	$ 97,000
	Contingency (10%)				$ 1,500 to	$ 9,700
	Total Estimated Annual Operation and Maintenance Cost				$ 16,500 to	$ 106,700

Total Present Worth		
Capital Cost	$13,200	
Groundwater Monitoring (discount factor of 5.2% for 10 to 30 years)	$ 200,616 to	$ 340,778
Annual Monitoring Report (discount factor of 5.2% for 10 to 30 years)	$ 50,134 to	$ 98,081
Site Evaluation (discount factor of 5.2% every 5 years for 10 to 30 years)	$ 27,969 to	$ 42,603
Site Maintenance (discount factor of 5.2% for 10 to 30 years)	$ 16,824 to	$ 33,062

TABLE 6.3

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 2 - MONITORED NATURAL ATTENUATION
WITH CONTINGENCIES
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
	Total Present Worth [3]				$ 309,000 to $ 528,000

Notes:

(1) Low End - O&M costs assume that groundwater ARARs are achieved in 10 years, and bedrock groundwater is cleaned up after 5 years. Therefore the monitoring duration is 10 years. The monitoring well network is assumed to consist of 3 overburden plume wells, 3 bedrock plume wells, 4 backgound wells, and 5 sentinel wells (4 are background wells).
- Year 1 - 10 wells analyzed for NA parameters and COCs quarterly, and 1 well analyzed for COCs semi-annually
- Year 2 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
- Years 3 to 5 - 11 wells analyzed for COCs annually
- Years 6 to 10 - 6 overburden wells analyzed for COCs annually

(2) High end - O& M costs assume the full 30-year duration is needed to meet groundwater ARARs for both the overburden and bedrock aquifers.
- Year 1 - 10 wells analyzed for NA parameters and COCs quarterly; 1 well analyzed for COCs semi-annually
- Year 2 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
- Years 3 to 30 - 11 wells analyzed for COCs annually

(3) Total Costs have been rounded to three significant figures.

NA - Natural Attenuation parameters

COCs - Contaminants of Concern

TABLE 6.4

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 3 - PUMP AND TREAT
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Institutional Controls				
	a) Deed restrictions	--	L.S.	--	$ 12,000
2.	Water Table Tile Collection System				
	a) Tile Collection Trench	1,400	L.F.	$ 200 to $ 375	$ 280,000 to $ 525,000
	b) Installation of 8 Manholes	160	V.F.	$ 160 to $ 220	$ 25,600 to $ 35,200
	c) Installation of 2 Wet Wells	45	V.F.	$ 1,200 to $ 1,500	$ 54,000 to $ 67,500
	d) Installation of Pump and electrical/mechanical hookup	2	ea.	$ 25,000 to $ 30,000	$ 50,000 to $ 60,000
	e) Forcemain	1,500	L.F.	$ 25 to $ 35	$ 37,500 to $ 52,500
	f) Electrical Conduit	1,500	L.F.	$ 8 to $ 10	$ 12,000 to $ 15,000
				Item 2 Subtotal	$ 459,100 to $ 755,200
3.	Bedrock Extraction Wells	5	ea.	$ 25,000 to $ 30,000	$ 125,000 to $ 150,000
4.	On-Site Groundwater Treatment Facility	--	L.S.	--	$ 320,000 to $ 380,000
5.	Gravity Discharge of Effluent to Beaverdam Brook	200	L.F.	$ 50 to $ 60	$ 10,000 to $ 12,000
				Estimated Capital Cost	$ 926,100 to $ 1,309,200
				Engineering (15%)	$ 138,915 to $ 196,380
				Subtotal	$ 1,065,015 to $ 1,505,580
				Contingency (10%)	$ 106,502 to $ 150,558
				Total Estimated Capital Cost	$ 1,171,517 to $ 1,656,138

					Low End [1]	High End [2]
Annual Operation and Maintenance Costs						
1.	Groundwater Treatment Plant Operations					
	a) Electrical Power Consumption	--	L.S.	--	$ 40,000	$ 40,000
	b) Maintenance (parts and labor)	--	L.S.	--	$ 52,000	$ 52,000
	c) Pretreatment Maintenance System	--	L.S.	--	$ 15,000	$ 15,000
	d) Carbon Replacement and Disposal	--	L.S.	--	$ 25,000	$ 25,000
				Item 1 Subtotal	$ 132,000	$ 132,000
2.	Groundwater Treatment System Monitoring (monthly for first year, quarterly thereafter)	12	Round	$ 2,000	$ 8,000 to	$ 24,000
3.	Groundwater Monitoring					
	Year 1 to 5	--	L.S.	--	$ 30,000	$ 30,000
	Year 6 to 10	--	L.S.	--	$ 10,000	$ 15,000
	Year 11 to 30				$ -	$ 15,000
4.	Annual Monitoring Report					
	Year 1 to 5	--	L.S.	--	$ 10,000	$ 10,000
	Year 6 to 10	--	L.S.	--	$ 3,000	$ 5,000
	Year 11 to 30	--	L.S.	--	$ -	$ 5,000
5.	Site Evaluation (once every 5 years)	--	L.S.	--	$ 10,000	$ 10,000

TABLE 6.4

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 3 - PUMP AND TREAT
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*	
					Low End [1]	High End [2]
6.	Site Maintenance	--	L.S.	--	$ 2,000	$ 2,000
	Estimated Annual Operation and Maintenance Cost				$ 155,000 to	$ 208,000
	Contingency (10%)				$ 15,500 to	$ 20,800
	Total Estimated Annual Operation and Maintenance Cost				$ 171,000 to	$ 229,000
Total Present Worth						
	Capital Cost				$ 1,171,517 to	$ 1,656,138
	Groundwater Treatment Plant Operations (discount factor of 5.2% for 10 years)				$1,110,386	
	Groundwater Treatment System Monitoring (discount factor of 5.2% for 10 years)				$84,026	
	Groundwater Monitoring (discount factor of 5.2% for 10 to 30 years)				$ 178,844 to	$ 319,007
	Annual Monitoring Report (discount factor of 5.2% for 10 to 30 years)				$ 58,390 to	$ 106,336
	Site Evaluation (discount factor of 5.2% every 5 years for 10 to 30 years)				$ 15,163 to	$ 29,798
	Site Maintenance (discount factor of 5.2% for 10 to 30 years)				$ 16,824 to	$ 33,062
	Total Present Worth [3]				$ 2,635,000 to	$ 3,339,000

Notes:
(1) Low End - O&M costs assume that groundwater meets the criteria in 10 years, and bedrock groundwater is cleaned up after 5 years. Therefore the monitoring duration is 10 years:
Years 1 to 5 - 11 wells (3 overburden plume wells, 3 bedrock plume wells, and 5 sentinel wells) analyzed for COCs semi-annually
Years 6 to 10 - 6 oberburden/sentinel wells analyzed for COCs annually
(2) High end - O& M costs assume the full 30-year duration is needed to meet groundwater criteria:
Years 1 to 5 - 11 wells analyzed for COCs semi-annually
Years 5 to 30 - 11 wells analyzed for COCs annually
(3) Total Costs have been rounded to three significant figures.

TABLE 6.5

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 4 - ENHANCED BIOREMEDIATION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Institutional Controls				
	a) Deed restrictions	--	L.S.	--	$ 12,000
2.	Enhanced Bioremediation Construction Costs				
	a) Sample Collection and Lab Treatability Study	--	L.S.	--	$ 10,000
	b) Design/Work Plan	--	L.S.	--	$ 10,000
	c) Tanks, pipes, miscellaneous	--	L.S.	--	$ 2,000
	d) Construction Facilities and Temporary Controls	--	L.S.	--	$ 1,100
	e) Mobilization/Demobilization	--	L.S.	--	$ 440
		Item 2 Subtotal			$ 23,540
3.	Initial ORC Treatment				
	a) Geoprobe Subcontractor and Equipment	32	days	$ 2,000	$ 64,000
	b) ORC-Adv Materials	14,050	lbs	$ 8.25	$ 115,913
		Item 3 Subtotal			$ 179,913
				Estimated Capital Cost	$ 215,453
				Engineering (40%)	$ 86,181
				Subtotal	$ 301,634
				Contingency (10%)	$ 30,163
				Total Estimated Capital Cost	$ 331,797

Annual Operation and Maintenance Costs

					Low End [1]	High End [2]
1.	Groundwater Monitoring					
	Year 1	--	L.S.	--	$ 80,000	$ 80,000
	Year 2	--	L.S.	--	$ 40,000	$ 40,000
	Years 3 to 5	--	L.S.	--	$ 15,000	$ 15,000
	Years 6 to 10	--	L.S.	--	$ 10,000	$ 15,000
	Years 11 to 30	--	L.S.	--	$ -	$ 15,000
2.	Annual Monitoring Report					
	Year 1	--	L.S.	--	$ 15,000	$ 15,000
	Year 2	--	L.S.	--	$ 10,000	$ 10,000
	Years 3 to 5	--	L.S.	--	$ 5,000	$ 5,000
	Years 6 to 10	--	L.S.	--	$ 3,000	$ 5,000
	Years 11 to 30	--	L.S.	--	$ -	$ 5,000
3.	Site Evaluation					
	First 5 Year review	--	L.S.	--	$ 25,000	$ 25,000
	Subsequent 5 year reviews	--	L.S.	--	$ 10,000	$ 10,000
4.	Site Maintenance	--	L.S.	--	$ 2,000	$ 2,000
				Estimated Annual Operation and Maintenance Cost	$ 15,000 to	$ 97,000
				Contingency (10%)	$ 1,500 to	$ 9,700
				Total Estimated Annual Operation and Maintenance Cost	$ 16,500 to	$ 106,700

TABLE 6.5

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 4 - ENHANCED BIOREMEDIATION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Total Present Worth					
	Capital Cost				$331,797
	Groundwater Monitoring (discount factor of 5.2% for 10 to 30 years)				$ 200,616 to $ 340,778
	Annual Monitoring Report (discount factor of 5.2% for 10 to 30 years)				$ 50,134 to $ 98,081
	Site Evaluation (discount factor of 5.2% every 5 years for 10 to 30 years)				$ 27,969 to $ 42,603
	Site Maintenance (discount factor of 5.2% for 10 to 30 years)				$ 16,824 to $ 33,062
	Total Present Worth [3]				$ 627,000 to $ 846,000

Notes:

(1) Low End - O&M costs assume that groundwater ARARs are achieved in 10 years, and bedrock groundwater is cleaned up after 5 years. Therefore the monitoring duration is 10 years. The monitoring well network is assumed to consist of 3 overburden plume wells, 3 bedrock plume wells, 4 backgound wells, and 5 sentinel wells (4 are background wells).
- Year 1 - 10 wells analyzed for NA parameters and COCs quarterly, and 1 well analyzed for COCs semi-annually
- Year 2 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
- Years 3 to 5 - 11 wells analyzed for COCs annually
- Years 6 to 10 - 6 overburden wells analyzed for COCs annually

(2) High end - O& M costs assume the full 30-year duration is needed to meet groundwater ARARs for both the overburden and bedrock aquifers.
- Year 1 - 10 wells analyzed for NA parameters and COCs quarterly; 1 well analyzed for COCs semi-annually
- Year 2 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
- Years 3 to 30 - 11 wells analyzed for COCs annually

(3) Total Costs have been rounded to three significant figures.

NA - Natural Attenuation parameters

COCs - Contaminants of Concern

TABLE 6.6

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 5 - BIOSPARGING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*	
Capital Costs						
1. Institutional Controls						
a) Deed restrictions		--	L.S.	--		$ 12,000
2. Biosparging Construction Costs						
a) Sample Collection and Lab Treatability Study		--	L.S.	--		$ 10,000
b) Design/Work Plan		--	L.S.	--		$ 10,000
c) iSOC System, Regulators, Valves, pipes, etc		4	ea.	$ 20,000		$ 80,000
d) System Installation and Oversite		--	L.S.	--		$ 5,300
e) Construction Facilities and Temporary Controls		--	L.S.	--		$ 5,000
f) Mobilization/Demobilization		--	L.S.	--		$ 2,000
		Item 2 Subtotal				$ 112,300
		Estimated Capital Cost				$ 124,300
		Engineering (40%)				$ 49,720
		Subtotal				$ 174,020
		Contingency (10%)				$ 17,402
		Total Estimated Capital Cost				$ 191,422
Annual Operation and Maintenance Costs						
1. Biosparging Treatment [1]					Low End [2]	High End [3]
a) Equipment Rental		4	ea.	$ 2,000	$ 8,000	$ 8,000
b) Oxygen and Nutrients		5000	lbs	$ 1.50	$ 7,500	$ 7,500
		Item 1 Subtotal			$ 15,500	$ 15,500
2. Groundwater Monitoring						
	Year 1	--	L.S.	--	$ 80,000	$ 80,000
	Year 2	--	L.S.	--	$ 40,000	$ 40,000
	Years 3 to 5	--	L.S.	--	$ 15,000	$ 15,000
	Years 6 to 10	--	L.S.	--	$ 10,000	$ 15,000
	Years 11 to 30	--	L.S.	--	$ -	$ 15,000
3. Annual Monitoring Report						
	Year 1	--	L.S.	--	$ 15,000	$ 15,000
	Year 2	--	L.S.	--	$ 10,000	$ 10,000
	Years 3 to 5	--	L.S.	--	$ 5,000	$ 5,000
	Years 6 to 10	--	L.S.	--	$ 3,000	$ 5,000
	Years 11 to 30	--	L.S.	--	$ -	$ 5,000
4. Site Evaluation						
	First 5 Year review	--	L.S.	--	$ -	$ 25,000
	Subsequent 5 year reviews	--	L.S.	--	$ -	$ 10,000
5. Site Maintenance		--	L.S.	--	$ 2,000	$ 2,000
	Estimated Annual Operation and Maintenance Cost				$ 15,000 to	$ 97,000
	Contingency (10%)				$ 1,500 to	$ 9,700
	Total Estimated Annual Operation and Maintenance Cost				$ 16,500 to	$ 106,700

TABLE 6.6

COST ESTIMATE FOR GROUNDWATER
REMEDIAL ALTERNATIVE 5 - BIOSPARGING
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Total Present Worth					
	Capital Cost				$191,422
	Biosparging (discount factor of 5.2% for 2 years)				$31,613
	Groundwater Monitoring (discount factor of 5.2% for 10 to 30 years)				$ 200,616 to $ 340,778
	Annual Monitoring Report (discount factor of 5.2% for 10 to 30 years)				$ 50,134 to $ 98,081
	Site Evaluation (discount factor of 5.2% every 5 years for 10 to 30 years)				$ 27,969 to $42,603
	Site Maintenance (discount factor of 5.2% for 10 to 30 years)				$ 16,824 to $33,062
	Total Present Worth [4]				$ 519,000 to $ 738,000

Notes:

(1) Low End - O&M costs assume that groundwater ARARs are achieved in 10 years, and bedrock groundwater is cleaned up after 5 years. Therefore the monitoring duration is 10 years. The monitoring well network is assumed to consist of 3 overburden plume wells, 3 bedrock plume wells, 4 backgound wells, and 5 sentinel wells (4 are background wells).
   Year 1 - 10 wells analyzed for NA parameters and COCs quarterly, and 1 well analyzed for COCs semi-annually
   Year 2 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
   Years 3 to 5 - 11 wells analyzed for COCs annually
   Years 6 to 10 - 6 overburden wells analyzed for COCs annually

(2) High end - O& M costs assume the full 30-year duration is needed to meet groundwater ARARs for both the overburden a bedrock aquifers.
   Year 1 - 10 wells analyzed for NA parameters and COCs quarterly; 1 well analyzed for COCs semi-annually
   Year 2 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
   Years 3 to 30 - 11 wells analyzed for COCs annually

(3) Total Costs have been rounded to three significant figures.

NA - Natural Attenuation parameters

COCs - Contaminants of Concern

TABLE 8.1

COST ESTIMATE FOR PREFERRED SITE REMEDY
EXCAVATION / ON-SITE BIOCELL AND MONITORED NATURAL ATTENUATION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
Capital Costs					
1.	Institutional Controls				
	a) Deed restrictions	--	L.S.	--	$ 12,000
2.	Site Preperation	--	L.S.	--	$ 80,000 to $ 120,000
3	Biocell Vacuum Extraction/Bioremediation Soil Treatment System				
	a) Materials and Equipment	--	L.S.	--	$ 200,000
	b) Equipment Building	--	L.S.	--	$ 30,000 to $ 50,000
	c) Utilities	--	L.S.	--	$ 30,000
			Item 3 Subtotal		$ 260,000 to $ 280,000
4.	Material Handling				
	a) Excavate, segregate, and stockpile upper clean soil	21,690	C.Y.	$ 6 to $ 8	$ 130,140 to $ 173,520
	b) Excavation of soil exceeding cleanup criteria	35,120	C.Y.	$ 8 to $ 12	$ 280,960 to $ 421,440
	c) Screening, amendment, and conditioning of soil to be treated	26,370 to 40,543	C.Y.	$ 5 to $ 10	$ 131,850 to $ 405,425
	d) Placement of soil to be treated in biocell	21,120 to 32,458	C.Y.	$ 4 to $ 6	$ 84,480 to $ 194,748
	e) Backfill, compact and grade clean soil, cobbles and shale	24,352 to 35,690	C.Y.	$ 5 to $ 7	$ 121,760 to $ 249,830
			Item 4 Subtotal		$ 749,190 to $ 1,444,963
5.	Soil Sampling				
	a) Segregation Sampling of upper clean material (VOCs and pyridines)	145	ea.	$ 600	$ 87,000
	b) Confirmatory Soil Sampling during excavation (VOCs and pyridines)	70	ea.	$ 600	$ 42,000
			Item 4 Subtotal		$ 129,000
			Estimated Capital Cost		$ 1,230,190 to $ 1,985,963
			Engineering (10%)		$ 123,019 to $ 198,596
			Subtotal		$ 1,353,209 to $ 2,184,559
			Contingency (10%)		$ 135,321 to $ 218,456
			Total Estimated Capital Cost		$ 1,488,530 to $ 2,403,015
Annual Operation and Maintenance Costs					
1.	Soil Treatment Plant Operation [1]				
	a) Electrical Power Consumption	--	L.S.	--	$ 50,000
	b) Maintenance (equipment and labor)				
	Year 1 (SVE and Biocell)	--	L.S.	--	$ 80,000
	Year 2 (Biocell only)	--	L.S.	--	$ 40,000
			Item 1 Subtotal		$ 90,000 to $ 130,000
2.	Biocell Treatment System Monitoring [1] (Collection and analysis of samples for TCL VOCs, SVOCs and SSPL parameters)				
	Year 1 (Startup, SVE and Biocell)	--	L.S.	--	$ 150,000
	Year 2 (Air Monitoring Bi-Weekly, Primarily biocell)	--	L.S.	--	$ 60,000
			Item 2 Subtotal		$ 60,000 to $ 150,000

TABLE 8.1

COST ESTIMATE FOR PREFERRED SITE REMEDY
EXCAVATION / ON-SITE BIOCELL AND MONITORED NATURAL ATTENUATION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*
3.	Verification Sampling (60 Soil sampled analyzed for TCL VOCs, SVOCs and SSPL parameters, Year 1 and 2 only)	60	ea.	$ 950	$ 57,000
4.	Groundwater Monitoring				Low End [2] / High End [3]
	Year 1 and 2	--	L.S.	--	$ 20,000 / $ 20,000
	Year 3	--	L.S.	--	$ 80,000 / $ 80,000
	Years 4	--	L.S.	--	$ 40,000 / $ 40,000
	Years 5 to 7	--	L.S.	--	$ 15,000 / $ 15,000
	Years 8 to 12	--	L.S.	--	$ 10,000 / $ 15,000
	Years 13 to 30	--	L.S.	--	$ - / $ 15,000
5.	Annual Monitoring Report				
	Year 1 and 2	--	L.S.	--	$ 5,000 / $ 5,000
	Year 3	--	L.S.	--	$ 15,000 / $ 15,000
	Years 4	--	L.S.	--	$ 10,000 / $ 10,000
	Years 5 to 7	--	L.S.	--	$ 5,000 / $ 5,000
	Years 8 to 12	--	L.S.	--	$ 3,000 / $ 5,000
	Years 13 to 30	--	L.S.	--	$ - / $ 5,000
6.	Site Evaluation				
	First 5 Year review	--	L.S.	--	$ 25,000 / $ 25,000
	Subsequent 5 year reviews	--	L.S.	--	$ 10,000 / $ 10,000
7.	Site Maintenance	--	L.S.	--	$ 2,000 / $ 14,000
	Estimated Annual Operation and Maintenance Cost				$ 15,000 to $ 376,000
	Contingency (10%)				$ 1,500 to $ 37,600
	Total Estimated Annual Operation and Maintenance Cost				$ 16,500 to $ 413,600
Total Present Worth					
	Capital Cost				$ 1,488,530 to $ 2,403,015
	Biocell/Treatment Plant Operation, Maintenance, Monitoring and Verification Sampling[1] (discount factor of 5.2% for 1 to 2 years)				$ 216,445 to $ 687,335
	Groundwater Monitoring (discount factor of 5.2% for 12 to 30 years)				$ 222,064 to $ 342,027
	Annual Monitoring Report (discount factor of 5.2% for 12 to 30 years)				$ 55,499 to $ 96,593
	Site Evaluation (discount factor of 5.2% every 5 years for 12 to 30 years)				$ 27,969 to $ 42,603
	Site Maintenance (discount factor of 5.2% for 12 to 30 years)				$ 43,756 to $ 57,537
	Total Present Worth [2]				$ 2,054,000 to $ 3,629,000

TABLE 8.1

COST ESTIMATE FOR PREFERRED SITE REMEDY
EXCAVATION / ON-SITE BIOCELL AND MONITORED NATURAL ATTENUATION
FORMER LAGOON SITE
HAMPTONBURGH, NEW YORK

Item	*Task*	*Quantity*	*Unit*	*Unit Cost*	*Cost*

Notes:

(1) Treatment operations and monitoring is for a 1 to 2 year period.

(2) Low End - O&M costs assume that groundwater ARARs are achieved in 10 years from start of Monitored Natural Attenuation (MNA), and bedrock groundwater is cleaned up after 5 years. Therefore the monitoring duration is 12 years including the 2-year biocell operation. The monitoring well network is assumed to consist of 3 overburden plume wells, 3 bedrock plume wells, 4 backgound wells, and 5 sentinel wells (4 are background wells).
   Years 1 to 2 - 5 sentinel wells analyzed for COCs semi-annually
   Year 3 - 10 wells analyzed for NA parameters and COCs quarterly, and 1 well analyzed for COCs semi-annually
   Year 4 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
   Years 5 to 7 - 11 wells analyzed for COCs annually
   Years 8 to 12 - 6 overburden wells analyzed for COCs annually

(2) High end - O& M costs assume the full 30 year duration is needed to meet groundwater criteria:
   Years 1 to 2 - 5 wells analyzed for COCs semi-annually
   Year 3 - 10 wells analyzed for NA parameters and COCs quarterly; 1 well analyzed for COCs semi-annually
   Year 4 - 10 wells analyzed for NA parameters and COCs and 1 well analyzed for COCs semi-annually
   Years 5 to 30 - 11 wells analyzed for COCs annually

(3) Total Costs have been rounded to three significant figures.