PARSONS ENGINEERING SCIENCE, INC.

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August 16, 1995
725980-01006

Mr. Stephen Absolom
FFA Program Manager
Directorate of Engineering and Housing
ATTN: SDSSE-HE
Building 123
Seneca Army Depot Activity
Romulus, New York 14541-5001

01005

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SUBJECT: **OB and OD Grounds Second Quarter 1995 Groundwater Monitoring Program, Seneca Army Depot Activity, Romulus, New York**

Dear Mr. Absolom:

This letter report describes the field activities and results obtained from the second quarter 1995 groundwater monitoring program performed for selected monitoring wells at the Open Burning (OB) and Open Detonation (OD) Grounds at the Seneca Army Depot Activity (SEDA). The analytical results indicate no releases have occurred from the Burning Tray at the OB Grounds or from the Open Detonation Mound at the OD Grounds.

The work for this quarter of groundwater monitoring has been performed in compliance with Task Number 11 described in the Scope of Work issued as Annex AC, Delivery Order 0029, to the current Parsons Engineering Science, Inc. (Parsons ES) Contract DACA87-92-D-0022.

Field Activities

Groundwater samples were obtained from each of the four monitoring wells at the OB Grounds (MW-12, MW-13, MW-14, and MW-27) and from two of the four monitoring wells at the OD Grounds (MW45-3 and -4) on June 8, 1995. The other two monitoring wells at the OD Grounds (MW45-1 and -2) could not be sampled because they were dry. The field forms documenting the collection of these samples are provided in Appendix A.

Groundwater Elevation Data

Groundwater levels in the four monitoring wells at the OB Grounds and two monitoring wells at the OD Grounds were measured on June 8, 1995. The measured depths and groundwater elevations are presented in Table 1. Groundwater elevation contours, prepared using linear interpolation, are presented in Figure 1 for the OB Grounds. The contours indicate the groundwater flows in a northeasterly direction. Groundwater elevation contours for the OD Grounds were not prepared because groundwater levels could be obtained from only two monitoring wells. The elevations from these two wells are presented in Figure 2.

Chemical Analysis

Groundwater samples were submitted to Aquatec Laboratories for chemical analysis. Four replicate samples from each of these six monitoring wells were analyzed for the standard indicator parameters (pH, conductivity, total organic carbon (TOC), and total organic halides (TOX)). One sample from each monitoring well was also analyzed for total phenols, chloride, sulfate, and the TAL metals. The chemical analysis data are presented in Tables 2, 3, 4, and 5. A set of the chemical analysis reports obtained from Aquatec Laboratories has been sent to Ms. Laura Percifield (CEMRD).

The QA/QC data associated with these analyses were reviewed to evaluate data quality. The forms containing this information are presented in Appendix B.

The standard indicator parameter data for the OB and OD Grounds from June 1994 to June 1995 have been summarized in Tables 6 and 7, respectively. Each measurement in these tables is an average of the analytical data from the four replicate samples that were obtained from each well.

Statistical Analysis

A statistical analysis was performed on the indicator parameter data from the OB and OD Grounds using the Students t-Test. The analysis was performed in accordance with EPA Solid Waste guidelines outlined in "Groundwater Monitoring Guidance for Owners and Operators of Interim Status Facilities" pages 75 through 81. The analysis results for the OB and OD Grounds are presented in Tables 8 and 9, respectively.

The results of the analysis concluded that there were statistically significant changes in some of the parameters at the OB and OD Grounds. At the OB Grounds, a statistically significant change occurred for pH in all four wells and for conductivity in compliance well MW-14. At the OD Grounds, a statistically significant increase occurred for pH and conductivity at compliance well MW45-3 and for TOX for MW45-3 and background well MW45-4.

Review of the historic indicator parameter data from the OB and OD Grounds in Tables 6 and 7, respectively, shows these statistically significant changes are probably due to the natural variations in the groundwater quality and not due to a release. At the OB Grounds, three parameters (conductivity, TOC, and TOX) showed no consistent increases in groundwater from MW-14 which is the monitoring well downgradient from the Burning Tray. pH increased by only 0.1 to 0.2 standard units in all four wells. At the OD Grounds, there was no consistent increase in any of the four parameters at the upgradient monitoring well MW45-4 and the downgradient well MW45-3.

In summary, chemical analysis data for the four indicator parameters, sulfate, chloride, total phenol, and the TAL metals were obtained from the monitoring wells at the OB and OD Grounds. The data indicate a release has not occurred at either site. Please do not hesitate to call me at (617) 859-2492 if you have any questions.

Sincerely,

PARSONS ENGINEERING SCIENCE, INC.

Michael Duchesneau, P.E.
Project Manager

MD/cmf/D#13

Enclosures

cc: Ms. L. Percifield, CEMRD
Ms. D. Richards, USACOE
Mr. R. Battaglia, CENAN

TABLE 1

SENECA ARMY DEPOT ACTIVITY
1995 GROUNDWATER MONITORING PROGRAM
GROUNDWATER ELEVATION DATA

Monitoring Well	Elevation at Top of Riser (MSL)	First Quarter 1995			Second Quarter 1995		
		Date	Depth from Top of Riser (ft.)	Elevation of Water Level (ft.)	Date	Depth from Top of Riser (ft.)	Elevation of Water Level (ft.)
OB Grounds							
MW-12	624.5	03/15/95	Not sampled		06/08/95	4.36	620.14
MW-13	627.09	03/15/95	2.3	624.79	06/08/95	4.95	622.14
MW-14	624.51	03/15/95	Not sampled		06/08/95	6.4	618.11
MW-27	625.94	03/15/95	Not sampled		06/08/95	6.7	619.24
OD Grounds							
MW45-1	625.08	03/15/95	Not sampled		06/08/95	Dry	
MW45-2	626.76	03/15/95	Not sampled		06/08/95	Dry	
MW45-3	626.45	03/15/95	Not sampled		06/08/95	9.4	617.05
MW45-4	633.04	03/15/95	5.27	627.77	06/08/95	8.36	624.68

TABLE 2

SENECA ARMY DEPOT ACTIVITY
OB GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
INDICATOR ANALYSIS RESULTS

	MATRIX	WATER	WATER	WATER	WATER
	SITE	OB	OB	OB	OB
	DATE SAMPLED	06/08/95	06/08/95	06/08/95	06/08/95
	ES ID	MW12A	MW12B	MW12C	MW12D
	LAB ID	260210	260211	260212	260213
PARAMETER	UNITS				
pH	stnd.units	7.38	7.41	7.38	7.4
Conductivity	umhos/cm	832	915	915	904
Total Organic Carbon	mg/L	1.3	1.3	1.3	1.3
Total Organic Halides	mg/L	0.02 U	0.02 U	0.02 U	0.02 U
Total Chloride	mg/L	8.7			
Total Phenols	mg/L	0.005 U			
Total Sulfate	mg/L	141			

TABLE 2

SENECA ARMY DEPOT ACTIVITY
OB GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
INDICATOR ANALYSIS RESULTS

	MATRIX	WATER	WATER	WATER	WATER
	SITE	OB	OB	OB	OB
	DATE SAMPLED	06/08/95	06/08/95	06/08/95	06/08/95
	ES ID	MW13A	MW13B	MW13C	MW13D
	LAB ID	260214	260215	260216	260217
PARAMETER	UNITS				
pH	stnd.units	7.14	7.15	7.13	7.13
Conductivity	umhos/cm	820	844	844	844
Total Organic Carbon	mg/L	1.3	1.3	1.3	0.9
Total Organic Halides	mg/L	0.02 U	0.02 U	0.02 U	0.02 U
Total Chloride	mg/L	5.2			
Total Phenols	mg/L	0.005 U			
Total Sulfate	mg/L	264			

TABLE 2

SENECA ARMY DEPOT ACTIVITY
OB GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
INDICATOR ANALYSIS RESULTS

PARAMETER	MATRIX / SITE / DATE SAMPLED / ES ID / LAB ID	UNITS	WATER OB 06/08/95 MW14A 260218	WATER OB 06/08/95 MW14B 260219	WATER OB 06/08/95 MW14C 260220	WATER OB 06/08/95 MW14D 260221	WATER OB 06/08/95 MW114 260266 MW14A Dup	WATER OB 06/08/95 MW14R 260222 Rinsate
pH		stnd.units	7.13	7.16	7.2	7.21		8.02
Conductivity		umhos/cm	1090	1090	1090	1090		4.2
Total Organic Carbon		mg/L	1.1	1.2	1.1	1.1		0.5 U
Total Organic Halides		mg/L	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U
Total Chloride		mg/L	17.7				17.8	0.5 U
Total Phenols		mg/L	0.005 U				0.005 U	0.005 U
Total Sulfate		mg/L	358				319	5 U

TABLE 2

SENECA ARMY DEPOT ACTIVITY
OB GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
INDICATOR ANALYSIS RESULTS

	MATRIX	WATER	WATER	WATER	WATER
	SITE	OB	OB	OB	OB
	DATE SAMPLED	06/08/95	06/08/95	06/08/95	06/08/95
	ES ID	MW27A	MW27B	MW27C	MW27D
	LAB ID	260223	260224	260225	260226
PARAMETER	UNITS				
pH	stnd.units	7.4	7.4	7.41	7.38
Conductivity	umhos/cm	904	915	915	915
Total Organic Carbon	mg/L	1.1	1.2	1.1	1.1
Total Organic Halides	mg/L	0.02 U	0.02 U	0.02 U	0.02 U
Total Chloride	mg/L	10			
Total Phenols	mg/L	0.005 U			
Total Sulfate	mg/L	129			

TABLE 3

SENECA ARMY DEPOT ACTIVITY
OB GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
VALIDATED METALS ANALYSIS RESULTS

	MATRIX	WATER	WATER	WATER	WATER	WATER	WATER
	SITE	OB	OB	OB	OB	OD	OB
	DATE SAMPLED	06/08/95	06/08/95	06/08/95	06/08/95	06/08/95	06/08/95
	ES ID	MW12A	MW13A	MW14A	MW27A	MW114	MW14R
	LAB ID	260210	260214	260218	260223	260266	260222
PARAMETER	UNITS					MW14A Dup	Rinsate
Aluminum	ug/L	33.6 R	39.1 R	207	25.5 R	56.6 J	22.1 J
Antimony	ug/L	2.1 U	2.1 J	2.1 U	2.1 U	2.1 U	2.1 U
Arsenic	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Barium	ug/L	101 J	76.6 J	47.8 J	80.9 J	47.4 J	2 U
Beryllium	ug/L	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Cadmium	ug/L	0.23 R	0.2 U	0.28 R	0.2 U	0.27 R	0.28 J
Calcium	ug/L	85100	138000	162000	89100	162000	55.9 U
Chromium	ug/L	0.79 U	0.8 U	0.88 J	0.79 U	0.79 U	0.79 U
Cobalt	ug/L	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Copper	ug/L	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Iron	ug/L	24.2 U	24.3 U	185 J	24.2 U	29.9 J	24.2 U
Lead	ug/L	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Magnesium	ug/L	65100	26900	32500	65800	32400	46.4 U
Manganese	ug/L	2 J	0.88 J	2.3 J	45.7	0.61 J	0.2 U
Mercury	ug/L	0.03 U	0.03 U	0.04 R	0.06 R	0.03 U	0.04 J
Nickel	ug/L	1.6 U	1.6 U	1.6 U	2 J	1.6 U	1.6 U
Potassium	ug/L	8270	1280 J	1340 J	8560	1360 J	47.7 U
Selenium	ug/L	4.8 J	3.2 J	4 J	4 J	3 U	3 U
Silver	ug/L	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Sodium	ug/L	16400	14600	30700	16000	38300	363 J
Thallium	ug/L	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U	4.7 U
Vanadium	ug/L	1.1 U	1.1 U	1.3 J	1.1 U	1.1 U	1.1 U
Zinc	ug/L	12.3 J	2.1 J	2.1 J	2.3 J	2.4 J	1.6 U
Cyanide	ug/L	5 U	5 U	5 U	5 U	5 U	5 U

NOTES:
J = The associated concentration is an estimate of the actual concentration.
U = The compound was not detected at or above the associated concentration.
R = The associated concentration is rejected.
ug/L + micrograms per liter

TABLE 4

SENECA ARMY DEPOT ACTIVITY
OD GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
INDICATOR ANALYSIS RESULTS

	MATRIX	WATER	WATER	WATER	WATER
	SITE	OD	OD	OD	OD
	DATE SAMPLED	06/08/95	06/08/95	06/08/95	06/08/95
	ES ID	MW45-3A	MW45-3B	MW45-3C	MW45-3D
	LAB ID	260227	260228	260229	260261
PARAMETER	UNITS				
pH	stnd.units	7.38	7.34	7.43	7.38
Conductivity	umhos/cm	1310	1360	1360	1310
Total Organic Carbon	mg/L	1	0.9	0.9	0.9
Total Organic Halides	mg/L	0.02 U	0.02 U	0.02 U	0.02 U
Total Chloride	mg/L	20.6			
Total Phenols	mg/L	0.005 U			
Total Sulfate	mg/L	612			

NOTES:
Monitoring wells MW45-1 and MW45-2 were dry.
U = The compound was not detected at or above the associated concentration.

TABLE 4

SENECA ARMY DEPOT ACTIVITY
OD GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
INDICATOR ANALYSIS RESULTS

	MATRIX	WATER	WATER	WATER	WATER
	SITE	OD	OD	OD	OD
	DATE SAMPLED	06/08/95	06/08/95	06/08/95	06/08/95
	ES ID	MW45-4A	MW45-4B	MW45-4C	MW45-4D
	LAB ID	260262	260263	260264	260265
PARAMETER	UNITS				
pH	stnd.units	7.18	7.26	7.24	7.26
Conductivity	umhos/cm	808	832	832	844
Total Organic Carbon	mg/L	0.9	0.8	0.9	0.9
Total Organic Halides	mg/L	0.02 U	0.02 U	0.02 U	0.02 U
Total Chloride	mg/L	2.3			
Total Phenols	mg/L	0.005 U			
Total Sulfate	mg/L	225			

TABLE 5

SENECA ARMY DEPOT ACTIVITY
OD GROUNDS SECOND QUARTER 1995 MONITORING PROGRAM
VALIDATED METALS ANALYSIS RESULTS

	MATRIX	WATER		WATER	
	SITE	OD		OD	
	DATE SAMPLED	06/08/95		06/08/95	
	ES ID	MW45-3A		MW45-4A	
	LAB ID	260227		260262	
PARAMETER	UNITS				
Aluminum	ug/L	456		173	J
Antimony	ug/L	2.1	U	2.1	U
Arsenic	ug/L	2.5	U	2.5	U
Barium	ug/L	17.4	J	21.9	J
Beryllium	ug/L	0.04	U	0.04	U
Cadmium	ug/L	0.33	R	0.37	R
Calcium	ug/L	194000		133000	
Chromium	ug/L	1.1	J	1	J
Cobalt	ug/L	1.7	J	1.1	U
Copper	ug/L	1.1	U	1.1	U
Iron	ug/L	608	U	261	
Lead	ug/L	1.5	U	1.5	U
Magnesium	ug/L	74800		29700	
Manganese	ug/L	196		29	
Mercury	ug/L	0.21		0.03	U
Nickel	ug/L	7.8	J	2.5	J
Potassium	ug/L	8730		2070	J
Selenium	ug/L	3	U	3	U
Silver	ug/L	1.5	J	1.2	U
Sodium	ug/L	17900		12900	
Thallium	ug/L	4.7	U	4.7	U
Vanadium	ug/L	1.6	J	1.1	U
Zinc	ug/L	6.3	J	3.5	J
Cyanide	ug/L	5	U	5	U

NOTES:
J = The associated concentration is an estimate of the actual concentration.
U = The compound was not detected at or above the associated concentration.
R = The associated concentration is rejected.
ug/L + micrograms per liter

TABLE 6

SENECA ARMY DEPOT ACTIVITY
SECOND QUARTER 1995 GROUNDWATER MONITORING PROGRAM
HISTORICAL SUMMARY OF OB GROUNDS INDICATOR PARAMETER DATA

Monitoring Well		June 1994	Dec 1994	June 1995
pH				
Upgradient Well:	MW-13	6.97	7.04	7.14
Downgradient Wells:	MW-12	7.3	7.37	7.4
	MW-14	7.07	7.11	7.18
	MW-27	7.28	7.34	7.4
Conductivity				
Upgradient Well:	MW-13	936	886	838
Downgradient Wells:	MW-12	897	911	892
	MW-14	1100	1082	1090
	MW-27	875	953	912
Total Organic Carbon				
Upgradient Well:	MW-13	1.2	1.2	1.2
Downgradient Wells:	MW-12	1.1	1.2	1.3
	MW-14	1	1	1.1
	MW-27	0.6	1	1.1
Total Organic Halides				
Upgradient Well:	MW-13	0.02U	0.03	0.02U
Downgradient Wells:	MW-12	0.02U	0.04	0.02U
	MW-14	0.02U	0.02U	0.02U
	MW-27	0.02U	0.03	0.02U

TABLE 7

SENECA ARMY DEPOT ACTIVITY
SECOND QUARTER 1995 GROUNDWATER MONITORING PROGRAM
HISTORICAL SUMMARY OF OD GROUNDS INDICATOR PARAMETER DATA

Monitoring Well		June 1994	Dec 1994	June 1995
pH				
Upgradient Well:	MW45-4	7.19	7.1	7.24
Downgradient Wells:	MW45-1	-	-	-
	MW45-2	7.05	-	-
	MW45-3	7.32	7.19	7.38
Conductivity				
Upgradient Well:	MW45-4	772	1030	829
Downgradient Wells:	MW45-1	-	-	-
	MW45-2	1488	-	-
	MW45-3	1788	1430	1335
Total Organic Carbon				
Upgradient Well:	MW45-4	0.6	1	0.9
Downgradient Wells:	MW45-1	-	-	-
	MW45-2	0.9	-	-
	MW45-3	0.8	0.8	0.9
Total Organic Halides				
Upgradient Well:	MW45-4	0.02U	0.02U	0.02U
Downgradient Wells:	MW45-1	-	-	-
	MW45-2	0.02U	-	-
	MW45-3	0.02	0.02U	0.02U

TABLE 8

OB Grounds Second Quarter 1995 Monitoring Program
Students t-Test Statistical Analysis Results

Background Well MW-13	TOC	pH	Specific Cond.	TOX
Intital Mean =	1.2	7.019375	909.5	0.0090625
Initial Variance =	0.1	0.00425958	704.5	0.00026406
Sample Size =	16	16	16	16

TOTAL ORGANIC CARBON (TOC)	Compliance Well MW -12	Background Well MW -13	Compliance Well MW -14	Compliance Well MW -27
t*=	1.22	0.09	-0.65	-0.65
tc=	2.60	3.65	2.73	2.73
	No Change	**No Change**	**No Change**	**No Change**

pH	Compliance Well MW -12	Background Well MW -13	Compliance Well MW -14	Compliance Well MW -27
t*=	20.78	6.95	6.31	21.62
tc=	3.45	3.01	4.57	3.32
	Increase	**Increase**	**Increase**	**Increase**

SPECIFIC CONDUCTANCE	Compliance Well MW -12	Background Well MW -13	Compliance Well MW -14	Compliance Well MW -27
t*=	-0.85	-7.99	27.20	0.38
tc=	4.35	3.47	2.60	2.89
	No Change	**No Change**	**Increase**	**No Change**

TOTAL ORGANIC HALIDES (TOX)	Compliance Well MW -12	Background Well MW -13	Compliance Well MW -14	Compliance Well MW -27
t*=	-1.00	-1.00	-1.00	-1.00
tc=	2.60	2.60	2.60	2.60
	No Change	**No Change**	**No Change**	**No Change**

key:
t*>= tc Most likely an increase in the indicator parameter
t*<tc Most likely no change in the indicator parameter

TABLE 8

OB Grounds
Background Well Concentrations

Background Well MW-13						
pH				Jun-94	Sept-94	Dec-94	Mar-95
				6.98	6.97	7.04	7.13
				6.97	6.95	7.03	7.15
				6.97	6.96	7.05	7.09
				6.97	6.95	7.02	7.08
Average	7.02	Variance	0.004260				
Spec Cond				Jun-94	Sept-94	Dec-94	Mar-95
				939	911	888	924
				941	876	861	867
				929	903	896	937
				933	915	897	935
Average	909.50	Variance	704.533333				
TOC				Jun-94	Sept-94	Dec-94	Mar-95
				1.2	1.8	1.2	0.7
				1.2	1.6	1.2	0.5
				1.2	1.7	1.2	0.9
				1.2	1.5	1.3	0.6
Average	1.19	Variance	0.137167				
TOX				Jun-94	Sept-94	Dec-94	Mar-95
				0.005	0.005	0.005	0.005
				0.005	0.005	0.005	0.005
				0.005	0.005	0.005	0.005
				0.005	0.005	0.07	0.005
Average	0.01	Variance	0.000264				

TABLE 9

OD Grounds Second Quarter 1995 Monitoring Program
Students t-Test Statistical Analysis Results

Background Well MW45-4	TOC	pH	Spec Cond.	TOX
Intital Mean =	0.85	7.17583333	875.1	0.005
Initial Variance =	0.0	0.00462652	14375.9	1.957E-43
Sample Size =	12	12	12	12

TOTAL ORGANIC CARBON (TOC)			
Compliance Well MW 45-1: Dry	Compliance Well MW 45-2: Dry	Compliance Well MW 45-3	Background Well MW 45-4
t*=	t*=	t*= 1.34	t*= 0.45
tc=	tc=	tc= 3.08	tc= 3.08
		No Change	**No Change**

pH			
Compliance Well MW 45-1: Dry	Compliance Well MW 45-2: Dry	Compliance Well MW 45-3	Background Well MW 45-4
t*=	t*=	t*= 7.67	t*= 2.17
tc=	tc=	tc= 4.39	tc= 4.42
		Increase	**No Change**

SPECIFIC CONDUCTANCE			
Compliance Well MW 45-1: Dry	Compliance Well MW 45-2: Dry	Compliance Well MW 45-3	Background Well MW 45-4
t*=	t*=	t*= 12.26	t*= -1.30
tc=	tc=	tc= 2.99	tc= 2.80
		Increase	**No Change**

TOTAL ORGANIC HALIDES (TOX)			
Compliance Well MW 45-1: Dry	Compliance Well MW 45-2: Dry	Compliance Well MW 45-3	Background Well MW 45-4
t*=	t*=	t*= 3.32	t*= 3.32
tc=	tc=	tc= 2.72	tc= 2.72
		Increase	**Increase**

key:
t*>= tc Most likely an increase in the indicator parameter
t*<tc Most likely no change in the indicator parameter

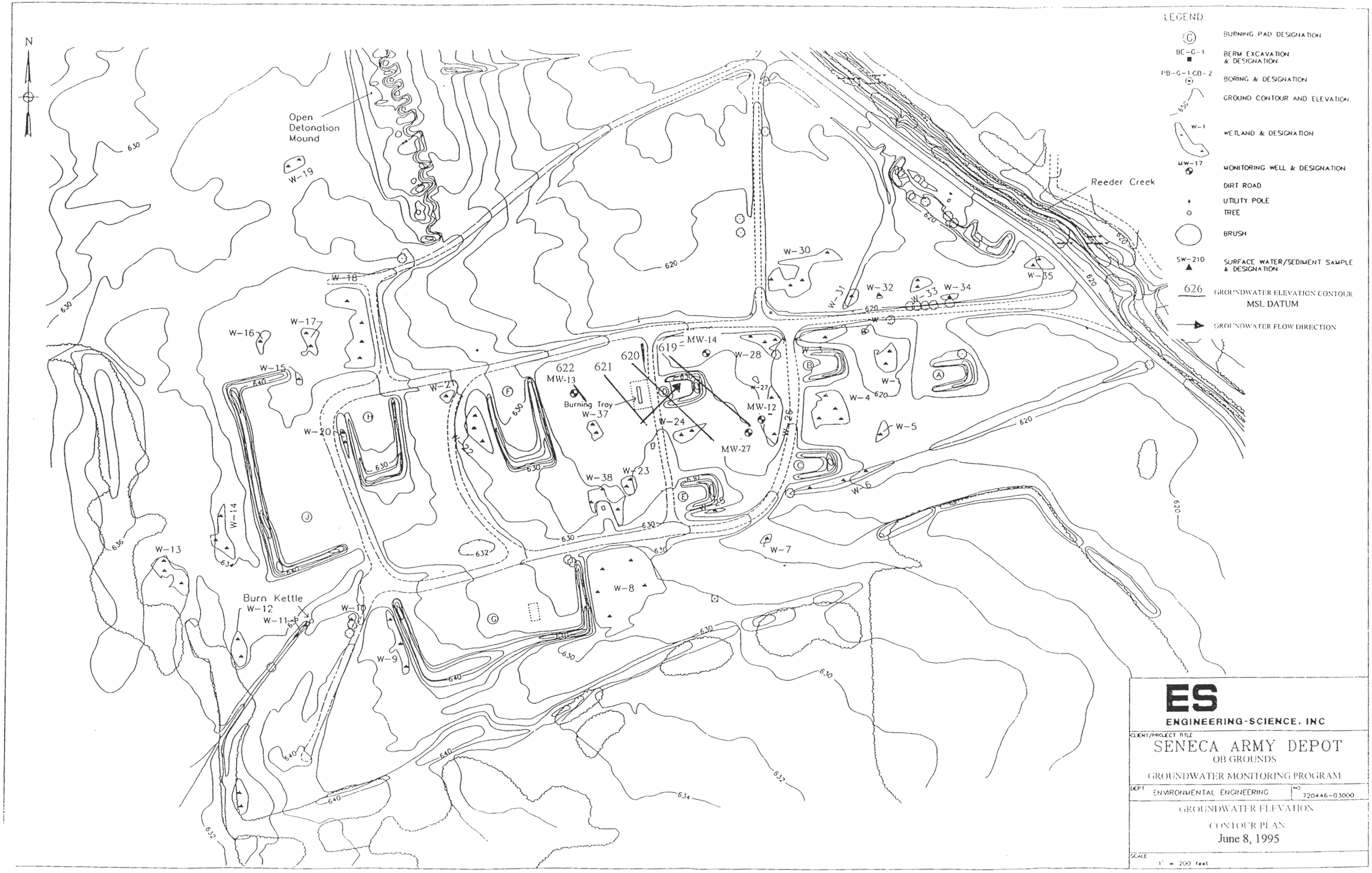
TABLE 9

OD Grounds
Background Well Concentrations

Background Well MW45-4						
pH			Jun-94	Sept-94	Dec-94	Mar-95
			7.19		7.06	7.27
			7.17		7.13	7.24
			7.2		7.1	7.25
			7.18		7.09	7.23
Average	7.18	Variance	0.004627			
Spec Cond			Jun-94	Sept-94	Dec-94	Mar-95
			752		1050	840
			791		1020	823
			713		1020	821
			831		1030	810
Average	875.08	Variance	14375.9			
TOC			Jun-94	Sept-94	Dec-94	Mar-95
			0.6		1	0.9
			0.6		1	0.9
			0.6		1	1
			0.7		1	0.9
Average	0.85	Variance	0.030000			
TOX			Jun-94	Sept-94	Dec-94	Mar-95
			0.005		0.005	0.005
			0.005		0.005	0.005
			0.005		0.005	0.005
			0.005		0.005	0.005
Average	0.01	Variance	0.000000			

NOTE: Monitoring well MW45-4 was dry in September 1995.

FIGURE 1



ENGINEERING-SCIENCE, INC

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT
OB GROUNDS
GROUNDWATER MONITORING PROGRAM

DEPT ENVIRONMENTAL ENGINEERING | NO 720446-0.3000

GROUNDWATER ELEVATION
CONTOUR PLAN
June 8, 1995

SCALE 1" = 200 feet

FIGURE 2

LOCATION OF DETONATION MOUND IN 1968.

MW45-1 MONITORING WELL AND DESIGNATION

617.1 GROUNDWATER ELEVATION MSL DATUM

N

100 0 100 200
(feet)

N 1013250

N 1013000

N 1012750

N 1012500

N 1012250

N 1012000

BRUSH

BRUSH

TREES & BRUSH

BRUSH

TREES & BRUSH

Open Detonation Mound

Dry
MW45-1

Dry
MW45-2

624.7
MW45-4

617.1
MW45-3

SEAD45

Dense Trees & Brush

Reeder Creek

SEAD45A

Open Burning Grounds

E 737250

E 737500

E 737750

E 738000

E 738250

E 738500

E 738750

E 739000

E 739250

ACAD\SENECA\RIFSCOPE\SD45ST.DWG

PARSONS

PARSONS ENGINEERING SCIENCE, INC.

SENECA ARMY DEPOT
OD GROUNDS

GROUNDWATER MONITORING PROGRAM

DEPT ENVIRONMENTAL ENGINEERING

Proj. No. 726511-02005

GROUNDWATER ELEVATION CONTOUR PLAN

June 8, 1995

APPENDIX A

SAMPLING DATA FORMS

1. Groundwater Sampling Forms
2. Chain of Custody Forms

1. GROUNDWATER SAMPLING FORMS

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	CLIENT: U.S. Army Corps of Engineers (USACOE)	DATE: 6-8-95

PROJECT: Quarterly Groundwater Monitoring OB Grounds
2nd Quarter of 1995
LOCATION: OB Grounds at the Seneca Army Depot Activity

INSPECTOR: ICES
LABORATORY: Aquatec
CHAIN OF CUSTODY #:

WELL NUMBER: MW-12

MONITORING INSTRUMENT: N/A DETECTOR:

SCREENED INTERVAL (TOC):

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:

STATIC DEPTH TO WATER (TOC): 4.36
WELL DEPTH (TOC): 9.18
FEET OF WATER IN WELL: 4.82

STANDING WATER VOLUME IN WELL (gallons): 4.8
THREE WELL VOLUMES (gallons):
ONE: .8 TWO: 1.6 THREE: 2.4

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: 1203 TIME END PURGING:

TIME:	1206	1212	1216			
DEPTH TO WATER (ft)	5.0	5.2	5.2			
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)	9.0	6.0	6.0			
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)	870	1000	1000			
VOLUME OF WATER REMOVED (gals)	.8	.8				
TEMPERATURE (deg. C)	11	12	11.5			
SPEC. COND (umhos)	700	702	706			
PH	7.45	7.40	7.39			

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE	6-8-95					
TIME	1225					
DEPTH TO WATER (ft)	4.36					
"AFTER PURGE" WATER COLUMN (ft)						
"STATIC" WATER COLUMN (ft)						
% RECOVERY	100%					

Notes:
(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.
(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)
Metals	1230			
Mercury	↓			0.69
TOC				
TOX				
Phenols				
CN				
Sulf + Cl⁻				
Spec. Cond + ph	↓			

REPLICATE SAMPLES:

REPLICATE SAMPLE COLLECTED: YES or NO

Replicate Sample Names:	Rep. 1	Rep. 2	Rep. 3	Rep. 4

QA\QC:

QA/QC SAMPLE COLLECTED: YES or NO

MRD SAMPLE NAME:

QA\QC RINSATE SAMPLE NAME:

MATRIX SPIKE SAMPLE COLLECTED: YES or NO

INVESTIGATION DERIVED WASTE (IDW):

Date:	6-8-95			
Volume Transfered to Drum:	2.4 gal			
Drum Number:	OB-1			

COMMENTS:

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	CLIENT: U.S. Army Corps of Engineers (USACOE)	DATE: 6/08/95

PROJECT: Quarterly Groundwater Monitoring OB Grounds
2nd Quarter of 1995
LOCATION: OB Grounds at the Seneca Army Depot Activity

INSPECTOR:
LABORATORY:
CHAIN OF CUSTODY #:

WELL NUMBER: MW - 13 OB1OD

MONITORING

INSTRUMENT	DETECTOR

SCREENED INTERVAL (TOC):

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:

STATIC DEPTH TO WATER (TOC): 5.0
WELL DEPTH (TOC): 10.13
FEET OF WATER IN WELL: 5.13

STANDING WATER VOLUME IN WELL (gallons): .84
THREE WELL VOLUMES (gallons):
ONE: .84 TWO: 1.68 THREE: 2.52

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: 15:30 15:34 15:37 TIME END PURGING: 15:41

TIME:	15:34	15:37	15:41			
DEPTH TO WATER (ft)	~~5.51~~	5.70	5.58			
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)	10 ~~08~~	10.0	8.0			
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)	900	900	570			
VOLUME OF WATER REMOVED (gals)	.84	.84	.84			
TEMPERATURE (deg. C)	12.3 ~~7.89~~	12.6	12.9			
SPEC. COND (umhos)	600	600	600			
PH 7.89	~~12.3~~	~~7~~ 7.34	7.50			

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE	6/8/95	~~6/9/95~~				
TIME	15:50	~~N/50~~				
DEPTH TO WATER (ft)	5.0					
"AFTER PURGE" WATER COLUMN (ft)	5.13					
"STATIC" WATER COLUMN (ft)	5.13					
% RECOVERY	100%					

Notes:

(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.

(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)
metals	15:50	1L, Poly		MW-13A
Mercury	15:50	0.5L, Poly		MW-13A 0.48 NTU
TOC	15:50	VOA		MW-13A; 13B; 13C; & 13D
TOX	15:50	8oz Amber		MW-13A, 13A, 13C, & 13D
Phenol	15:50	1L, Amber		MW-13A
Cyanide	15:50	1L, Poly		MW-13A
cond, pH, chloride sulfate	15:50	1L, Poly		MW-13A
Cond, pH	15:50	0.5L, Poly		MW-13B; 13C; & 13D

REPLICATE SAMPLES:

REPLICATE SAMPLE COLLECTED: YES or NO

Replicate Sample Names:

Rep. 1	Rep. 2	Rep. 3	Rep. 4
MW-13B	MW-13C	MW-13D	

QA\QC:

QA/QC SAMPLE COLLECTED: YES or NO

MRD SAMPLE NAME: —

QA\QC RINSATE SAMPLE NAME: —

MATRIX SPIKE SAMPLE COLLECTED: YES or (NO)

INVESTIGATION DERIVED WASTE (IDW):

Date:	6/8/95			
Volume Transfered to Drum:	2 gal			
Drum Number:	OB-1			

COMMENTS:

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	CLIENT: U.S. Army Corps of Engineers (USACOE)	DATE: 6/08/95

PROJECT: Quarterly Groundwater Monitoring OB Grounds
2nd Quarter of 1995
LOCATION: OB Grounds at the Seneca Army Depot Activity

INSPECTOR:
LABORATORY:
CHAIN OF CUSTODY #:

WELL NUMBER: MW-14

MONITORING INSTRUMENT: DETECTOR:

SCREENED INTERVAL (TOC):

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	(2)	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:

STATIC DEPTH TO WATER (TOC): 6.40
WELL DEPTH (TOC): 10.57
FEET OF WATER IN WELL: 4.17

STANDING WATER VOLUME IN WELL (gallons): .68
THREE WELL VOLUMES (gallons):
ONE: .68 TWO: 1.36 THREE: 2.03

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: 13 30 13:35 13:40 TIME END PURGING: 13:40

TIME:	13:34	13:39	13:44			
DEPTH TO WATER (ft) 6.75	~~6.98~~	6.84	7.08			
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)	10.0	~~8.5~~ 8.5	8.5			
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)	900	570	570			
VOLUME OF WATER REMOVED (gals)	.68	.68	.68			
TEMPERATURE (deg. C)	11.4	12.6	12.7			
SPEC. COND (umhos)	800	800	800			
PH	7.58	7.47	7.49			

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE	6/08/95					
TIME						
DEPTH TO WATER (ft)	6.56					
"AFTER PURGE" WATER COLUMN (ft)	4.01					
"STATIC" WATER COLUMN (ft)	~~6.40~~ 4.17					
% RECOVERY	96 %					

Notes:

(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.

(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)
Metals	14:30	1L Poly		MW-14A + MW-14MRD ✓
Mercury	14:30	0.5L Poly		MW-14A, MW-14MRD, MW-11
TOC	14:30	VOA		
TOX	14:30	8oz Amber GL.		
Phenol	14:30	1LT. Amber		
Cyanide	14:30	1LT Poly		
Chloride + Sulfate	14:30	0.5L Poly		
pH, Cond.	14:30	0.5L Poly		

REPLICATE SAMPLES:

REPLICATE SAMPLE COLLECTED: YES or NO

Replicate Sample Names:	Rep. 1	Rep. 2	Rep. 3	Rep. 4
		14B	14C	14D

QA\QC:

QA/QC SAMPLE COLLECTED: YES or NO

MRD SAMPLE NAME: MW-14MRD

* QA\QC RINSATE SAMPLE NAME: MW-14R and MW-14MRD-R

MATRIX SPIKE SAMPLE COLLECTED: YES or NO

INVESTIGATION DERIVED WASTE (IDW):

Date:	6/6/95			
Volume Transfered to Drum:	2 Vac-C			
Drum Number:	OB-1			

COMMENTS:

* Used Diamond Distilled Water 08:33, 03/17/94, Exp. 03/96
Bar code 340484.

- Rinsate pumped Through Tygon Tubing of peristaltic pump no Bailers used here!

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	CLIENT: U.S. Army Corps of Engineers (USACOE)	DATE: 6/08/95

PROJECT: Quarterly Groundwater Monitoring OB Grounds
2nd Quarter of 1995
LOCATION: OB Grounds at the Seneca Army Depot Activity

INSPECTOR:
LABORATORY:
CHAIN OF CUSTODY #:

WELL NUMBER: MW-27 DEMO

MONITORING

INSTRUMENT	DETECTOR

SCREENED INTERVAL (TOC):

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	(2)	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:
STATIC DEPTH TO WATER (TOC): 8.70
WELL DEPTH (TOC): 15.40
FEET OF WATER IN WELL: 8.70 - 6.76
STANDING WATER VOLUME IN WELL (gallons):
THREE WELL VOLUMES (gallons):
ONE: 1.10 TWO: 2.20 THREE: 3.30

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: 12:00 12:08 12:15 TIME END PURGING: 12:20

TIME:	12:08	12:15	12:20			
DEPTH TO WATER (ft)	6.47	6.58	6.60			
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)	15.0	11.0	11.0			
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)	570	570	570			
VOLUME OF WATER REMOVED (gals)	1.1	1.1	1.1			
TEMPERATURE (deg. C)	10.2	10.1	10.2			
SPEC. COND (umhos)	600	600	600			
PH	7.83	7.83	7.87			

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE	6/08/95					
TIME	12:20					
DEPTH TO WATER (ft)	6.7					
"AFTER PURGE" WATER COLUMN (ft)						
"STATIC" WATER COLUMN (ft)	6.6					
% RECOVERY	100%					

Notes:
(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.
(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)
Metals	12:20	1L Poly		
Mercury	12:30	.5L Poly		.48
TOC	12:35	VOA		
TOX	12:45	8oz Amber		
Phenols	12:55	1L Amber		
Cyanide	13:00	1L Poly		
Sulfate	13:08	.5L Poly		
Spec. Cond.	13:12	.5L Poly		

REPLICATE SAMPLES:

REPLICATE SAMPLE COLLECTED: (YES) or NO

Replicate Sample Names:	Rep. 1	Rep. 2	Rep. 3	Rep. 4

QA\QC:

QA/QC SAMPLE COLLECTED: (YES) or NO

MRD SAMPLE NAME:

QA\QC RINSATE SAMPLE NAME:

MATRIX SPIKE SAMPLE COLLECTED: YES or NO

INVESTIGATION DERIVED WASTE (IDW):

Date:	6/4/95			
Volume Transfered to Drum:	4.2 gals			
Drum Number:	~~Asm-3~~ OB-1			

COMMENTS:

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	**CLIENT:** U.S. Army Corps of Engineers (USACOE)	**DATE:** 6-8-95
PROJECT: Quarterly Groundwater Monitoring Ash Landfill (Complete Round) **2nd Quarter of 1995** **LOCATION: Ash Landfill Site at the Seneca Army Depot Activity**		**INSPECTOR:** ICKS **LABORATORY:** **CHAIN OF CUSTODY #:**
WELL NUMBER: MW 45-1 **SCREENED INTERVAL (TOC):**		**MONITORING** **INSTRUMENT** / **DETECTOR**

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:

STATIC DEPTH TO WATER (TOC): 7.98
WELL DEPTH (TOC): 8.6
FEET OF WATER IN WELL:
STANDING WATER VOLUME IN WELL (gallons):
THREE WELL VOLUMES (gallons):
ONE: TWO: THREE:

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: TIME END PURGING:

TIME:						
DEPTH TO WATER (ft)	DRY		WELL			
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)						
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)						
VOLUME OF WATER REMOVED (gals)						
TEMPERATURE (deg. C)						
SPEC. COND (umhos)						
PH						

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE						
TIME						
DEPTH TO WATER (ft)						
"AFTER PURGE" WATER COLUMN (ft)						
"STATIC" WATER COLUMN (ft)						
% RECOVERY						

Notes:

(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.

(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)

QA\QC:

QA/QC SAMPLE COLLECTED: YES or NO
MRD SAMPLE NAME:
QA\QC RINSATE SAMPLE NAME:
MATRIX SPIKE SAMPLE COLLECTED: YES or NO

INVESTIGATION DERIVED WASTE (IDW):

Date:				
Volume Transfered to Drum:				
Drum Number:				

COMMENTS:

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	CLIENT: U.S. Army Corps of Engineers (USACOE)	DATE: 6-8-95

PROJECT: Quarterly Groundwater Monitoring OB Grounds
2nd Quarter of 1995
LOCATION: OB Grounds at the Seneca Army Depot Activity

INSPECTOR:
LABORATORY:
CHAIN OF CUSTODY #:

WELL NUMBER: MW45-2

MONITORING

INSTRUMENT	DETECTOR

SCREENED INTERVAL (TOC):

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:

STATIC DEPTH TO WATER (TOC): 11.53
WELL DEPTH (TOC): 12.38
FEET OF WATER IN WELL: .85
STANDING WATER VOLUME IN WELL (gallons): .13
THREE WELL VOLUMES (gallons):
ONE: .13 TWO: .26 THREE: .39

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: 1341 DRY WELL - No Recovery TIME END PURGING:

TIME:	1344	1348				
DEPTH TO WATER (ft)	12.14	12.38				
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)	12.38	12.38				
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)	140	100				
VOLUME OF WATER REMOVED (gals)	.05	.05				
TEMPERATURE (deg. C)	11	11				
SPEC. COND (umhos)	1100	1100				
PH	7.03	7.11				

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE						
TIME						
DEPTH TO WATER (ft)						
"AFTER PURGE" WATER COLUMN (ft)						
"STATIC" WATER COLUMN (ft)						
% RECOVERY						

Notes:

(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.

(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)

REPLICATE SAMPLES:

REPLICATE SAMPLE COLLECTED: YES or NO

Replicate Sample Names:	Rep. 1	Rep. 2	Rep. 3	Rep. 4

QA\QC:

QA/QC SAMPLE COLLECTED: YES or NO

MRD SAMPLE NAME:

QA\QC RINSATE SAMPLE NAME:

MATRIX SPIKE SAMPLE COLLECTED: YES or NO

INVESTIGATION DERIVED WASTE (IDW):

Date:				
Volume Transfered to Drum:				
Drum Number:				

COMMENTS:

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	CLIENT: U.S. Army Corps of Engineers (USACOE)	DATE: 6-8-95

PROJECT: Quarterly Groundwater Monitoring OB Grounds
2nd Quarter of 1995
LOCATION: OB Grounds at the Seneca Army Depot Activity

INSPECTOR: KCS
LABORATORY:
CHAIN OF CUSTODY #:

WELL NUMBER: 45 MW45-3

MONITORING

INSTRUMENT	DETECTOR

SCREENED INTERVAL (TOC):

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:
STATIC DEPTH TO WATER (TOC): 9.40
WELL DEPTH (TOC): 14.04
FEET OF WATER IN WELL: 4.64
STANDING WATER VOLUME IN WELL (gallons): .75
THREE WELL VOLUMES (gallons):
ONE: .75 TWO: 1.50 THREE: 2.25

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: 1422 TIME END PURGING:

TIME:	1429	1434	1449			
DEPTH TO WATER (ft)	10.30	11.50	11.72			
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)	14.0	12.0	12.0			
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)	300	600 ~~300~~	180 ~~100~~			
VOLUME OF WATER REMOVED (gals)	.75	.75	.30	Dry Slow well		
TEMPERATURE (deg. C)	10	10	10			
SPEC. COND (umhos)	1000	1000	1000			
PH	7.62	7.25	7.23			

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE	06/08/95	06/09/95				
TIME	16:30	7:30				
DEPTH TO WATER (ft)	11.2	12.38				
"AFTER PURGE" WATER COLUMN (ft)						
"STATIC" WATER COLUMN (ft)						
% RECOVERY	80%					

Notes:
(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.
(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)
Metals	17:15	1L, P.L		45.1 MW-45-3-A
Mercury	17:15	0.5 L, P.L		MW-45-3-A
TOC	17:15	VOA		MW-45-3-A ; 3-B ; 3-C ; 3-D
TOX	17:15	8oz Amber		MW-45-3-A ; 3-B ; 3-C ; 3-D
cond. ; pH, chloride, sulfate	17:15	1L, P.L		MW-45-A
Cyanide	17:15	1L, P.L		MW-45-3A
cond, pH	17:15	0.5L, P.L		MW-45-3-B ; 3-C ; 3-D

REPLICATE SAMPLES:

REPLICATE SAMPLE COLLECTED: YES or NO

Replicate Sample Names:	Rep. 1	Rep. 2	Rep. 3	Rep. 4
	45-3-B	45-3-C	45-3-D	

QA\QC:

QA/QC SAMPLE COLLECTED: YES or NO

MRD SAMPLE NAME: N/A

QA\QC RINSATE SAMPLE NAME: N/A

MATRIX SPIKE SAMPLE COLLECTED: YES or NO

INVESTIGATION DERIVED WASTE (IDW):

Date:	6/6/95			
Volume Transfered to Drum:	1 Gal.			
Drum Number:	OB-1			

COMMENTS:

SAMPLING RECORD FOR REPLICATES - GROUNDWATER

PARSONS ENGINEERING SCIENCE, INC.	CLIENT: U.S. Army Corps of Engineers (USACOE)	DATE: 6-8-95
PROJECT: Quarterly Groundwater Monitoring OB Grounds 2nd Quarter of 1995 LOCATION: OB Grounds at the Seneca Army Depot Activity		INSPECTOR: KKS LABORATORY: CHAIN OF CUSTODY #:
WELL NUMBER: MW45-4 SCREENED INTERVAL (TOC):		MONITORING INSTRUMENT / DETECTOR

WELL DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	5.87

PURGE INFORMATION:

STATIC DEPTH TO WATER (TOC): 8.36
WELL DEPTH (TOC): 9.70 (9.03)
FEET OF WATER IN WELL: 1.34
STANDING WATER VOLUME IN WELL (gallons): .22
THREE WELL VOLUMES (gallons):
ONE: .22 TWO: .44 THREE: .66

PURGING WITH A PERISTALTIC PUMP OR BAILER

(measure indicator parameters at one, two and three well volumes)

TIME BEGIN PURGING: 1522 TIME END PURGING:

TIME:	1525	1527				
DEPTH TO WATER (ft)	8.46	8.50				
DEPTH TO BOTTOM OPENING OF TEFLON TUBE (TOC)	9.7	8.7	8.7			
FLOW RATE (ml/min.) or VOL. OF BAILER (gal.)	450	450	450			
VOLUME OF WATER REMOVED (gals)	.22	.22				
TEMPERATURE (deg. C)	12	11.5	11.5			
SPEC. COND (umhos)	650	650	650			
PH	7.48	7.37	7.31			

DEPTH TO WATER MEASUREMENTS AFTER PURGING

DATE	6-8-95					
TIME	1540					
DEPTH TO WATER (ft)	8.36					
"AFTER PURGE" WATER COLUMN (ft)						
"STATIC" WATER COLUMN (ft)						
% RECOVERY	100%					

Notes:

(1) Determine water column in the well (for both "after purge" and "static" conditions) by subtracting the measured water level from the well point.

(2) Divide the "after purge" water column by the "static" water column and multiply by 100 to determine the percent of recovery for the well.

SAMPLING INFORMATION

SAMPLING DEVICE:

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY SAMPLE TAKEN AFTER (CHECK ONE)
Metals	1545			
Mercury	|			✓ 0.84
TOC	|			
TOX	|			
Phenols	|			
CN	|			
Sulf + Cl⁻	|			
Spec Cond	V			

REPLICATE SAMPLES:

REPLICATE SAMPLE COLLECTED: YES or NO

Replicate Sample Names:	Rep. 1	Rep. 2	Rep. 3	Rep. 4
	MW45-4A	MW45-4B	MW45-4C	MW45-4D

QA\QC:

QA/QC SAMPLE COLLECTED: YES or (NO)

MRD SAMPLE NAME:

QA\QC RINSATE SAMPLE NAME:

MATRIX SPIKE SAMPLE COLLECTED: YES or (NO)

INVESTIGATION DERIVED WASTE (IDW):

Date:	6-8-95			
Volume Transfered to Drum:	.06			
Drum Number:	~~ASH~~ -1			

COMMENTS: Brown silt in sump - cleaned in .01 gal

2. CHAIN OF CUSTODY FORMS

CHAIN-OF-CUSTODY RECORD

PAGE 1 OF 1

PARSONS
ENGINEERING-SCIENCE, INC.
Prudential Center
Boston, MA 02199
Phone: 617-859-2000
Fax: 617-859-2043

JOB NO. 725980-01006
PROJECT SEAD - 2nd Quarterly Monitoring '95 OB/OD
CONTACT M. Duchesneau

LABORATORY Aquatec
ADDRESS Colchester VT
CONTACT Lori Arnold

SAMPLE NO.	LABORATORY SAMPLE NO.	SAMPLING DATE	SAMPLING TIME	SAMPLE DEPTH	SAMPLE MATRIX	ANALYSES: VOA TOC	SVOC TOC	METALS	Spec Cond + PEST/PCB pH	CN	Mercury HERB	Phenols FRH	Cl⁻ + SO₄	Spec Cond pH Cl⁻ + SO₄		NO. OF CONTAINERS	COMMENTS (Special instructions, cautions, etc.)
MW-12A		6-8-95	1230	N/A	water	2	1	1		1	1	1		1		8	
MW-12B						2	1		1								
MW-12C						2	1		1								
MW-12D						2	1		1								
MW45-4A			1545			2	1	1		1	1	1		1		8	
MW45-4B						2	1		1							4	
MW45-4C						2	1		1							4	
MW45-4D						2	1		1							4	

Sampled and Relinquished by
Sign
Print Kerry Smith
Firm Parsons ES
Date 6-9-95 Time 1400

Received by
Sign
Print
Firm
Date Time

Relinquished by
Sign
Print
Firm
Date Time

Received by
Sign
Print
Firm
Date Time

Evidence Samples tampered with? ☐ No ☐ Yes
If Yes, explain in remarks.

	VOA Vial	Glass Bottle	Plastic Bottle	Preservative	Container Volume
VOA TOC	X			A E	40 ml
SVOC TOC		X		A E	250 ml
METALS			X	A D	1 L
Spec Cond + PEST/PCB pH			X	A	500 ml
CN			X	A F	1 L
Mercury HERB			X	A	500 ml
Phenols FRH		X		A E	1 L
Cl⁻ + SO₄					
Spec Cond pH Cl⁻ + SO₄			X	A	1 L

PRESERVATION KEY:
A - Ice
B - Filtered
C - Acidified with HCl
D - Acidified with HNO_3
E - Acidified with H_2SO_4
F - NaOH + Ascorbic
G - Other

REMARKS: (Sample storage, nonstandard sample bottles)
preserve Metals + Mercury upon receiving
Return cooler to: Parsons E
Seneca Army Depot
Building 323
Romulus, NY 14541-5001
Attn - Kerry Smith

Cooler #: ES-65

ESB - Form COC1 White - return with data Yellow - lab copy Pink - Sampler copy

CHAIN-OF-CUSTODY RECORD

PAGE 1 OF 1

PARSONS
ENGINEERING-SCIENCE, INC.
Prudential Center, Boston, MA 02199 — Phone: 617-859-2000, Fax: 617-859-2043

JOB NO. 725980-01006
PROJECT SEAD-2nd Quarterly Monitoring OX/OD
CONTACT M. Duchsneau

LABORATORY Aquatec
ADDRESS Colchester, VT
CONTACT Lori Arnold

SAMPLE NO.	LABORATORY SAMPLE NO.	SAMPLING DATE	SAMPLING TIME	SAMPLE DEPTH	SAMPLE MATRIX	ANALYSES: ~~VOA Tox~~	~~SVOC Tox~~	METALS	~~Spec. Cond~~ PESTICIDES ~~pH~~	CN	~~Mercury~~ HERB	~~TPH~~ phenols	Cl^- + Sulf	~~Cond~~ pH Cl^- + Sulf	NO. OF CONTAINERS	COMMENTS (Special instructions, cautions, etc.)
MW-27A		6-8-95	1220	N/A	Water	6	3	3	1	3	3	3	3		25	Matrix Spike
MW-27B			↓			2	1		1						4	
MW-27C			↓			2	1		1						4	
MW-27D			↓			2	1		1						4	
		KKS														

Sampled and Relinquished by
Sign [signature]
Print Kerry Smith
Firm Parsons ES
Date 6-9-95 Time 1400

Received by
Sign
Print
Firm
Date Time

Relinquished by
Sign
Print
Firm
Date Time

Received by
Sign
Print
Firm
Date Time

Evidence Samples tampered with? ☐ No ☐ Yes
If Yes, explain in remarks.

VOA Vial	X														
Glass Bottle		X							X						
Plastic Bottle			X	X	X	X		X							
Preservative	A E	A E	A D	A	A F	A D	A E	A							
Container Volume	40 ml	250 ml	1 L	500 ml	1 L	500 ml	1 L	500 ml							

PRESERVATION KEY:
A - Ice
B - Filtered
C - Acidified with HCl
D - Acidified with HNO_3
E - Acidified with H_2SO_4
F - NaOH + Ascorbic
G - Other

REMARKS: (Sample storage, nonstandard sample bottles)
Preserve Metals + Mercury upon receiving
Return cooler to Parsons Engineering Science Seneca Army Depot Building 323 Romulus, NY 14541-5001

Cooler #: ES-44

ESB - Form COC1 White - return with data Yellow - lab copy Pink - Sampler copy

CHAIN-OF-CUSTODY RECORD

PARSONS
ENGINEERING-SCIENCE, INC.
Prudential Center
Boston, MA 02199
Phone: 617-859-2000
Fax: 617-859-2043

JOB NO. 725980-01006
PROJECT SEAD - 2nd Quarterly Monitoring OB/OD
CONTACT M. Duchesneau

LABORATORY Colchester Aquatec
ADDRESS Colchester, VT
CONTACT Lori Arnold

SAMPLE NO.	LABORATORY SAMPLE NO.	SAMPLING DATE	SAMPLING TIME	SAMPLE DEPTH	SAMPLE MATRIX	~~VOA~~ TOC	~~SVOC~~TOX	METALS	Spec Cond pH (~~PEST/PCB~~)	CN	Mercury (~~HERB~~)	~~TPH~~ Phenols	Cl- + Sulf	Cond, pH, Cl-, Sulf		NO. OF CONTAINERS	COMMENTS (Special instructions, cautions, etc.)
MW-13A		6-8-95	1550	N/A	water	2	1	1		1	1	1		1		8	
MW-13B		↓	↓	↓	↓	2	1		1							4	
MW-13C		↓	↓	↓	↓	2	1		1							4	
MW-13D		↓	↓	↓	↓	2	1		1							4	
MW45-3A		↓	1715	↓	↓	2	1	1		1	1	1				7	
MW45-3B		↓	↓	↓	↓	2	1		1							4	
MW45-3C		↓	↓	↓	↓	2	1		1							4	
MW45-3D		↓	↓	↓	↓	2	1		1							4	
MW45-3A		6-8-95	1730	↓	↓									1		1	

	TOC	TOX	METALS	Spec Cond pH	CN	Mercury	Phenols	Cl- + Sulf	Cond, pH, Cl-, Sulf	
VOA Vial	X									
Glass Bottle		X					X			
Plastic Bottle			X	X	X	X			X	
Preservative	A E	A E	A D	A	A F	A	A E		A	
Container Volume	40 ml	250 ml	1 L	500 ml	1 L	500 ml	1 L		1 L	

Sampled and Relinquished by
Sign [signature]
Print Kerry Smith
Firm Parsons ES
Date 6-9-95 Time 1400

Received by
Sign
Print
Firm
Date Time

Relinquished by
Sign
Print
Firm
Date Time

Received by
Sign
Print
Firm
Date Time

Evidence Samples tampered with? ☐ No ☐ Yes
If Yes, explain in remarks.

PRESERVATION KEY:
A - Ice
B - Filtered
C - Acidified with HCl
D - Acidified with HNO_3
E - Acidified with H_2SO_4
F - NaOH + Ascorbic
G - Other

REMARKS: (Sample storage, nonstandard sample bottles)
preserve metals + mercury upon receiving

Cooler #:

CHAIN-OF-CUSTODY RECORD

PARSONS
ENGINEERING-SCIENCE, INC.
Prudential Center
Boston, MA 02199
Phone: 617-859-2000
Fax: 617-859-2043

JOB NO. 725980-01006
PROJECT SEAD - 2nd Quarterly Monitoring OB/OD
CONTACT M. Duchesneau

LABORATORY Aquatec
ADDRESS Colchester VT
CONTACT Lori Arnold

SAMPLE NO.	LABORATORY SAMPLE NO.	SAMPLING DATE	SAMPLING TIME	SAMPLE DEPTH	SAMPLE MATRIX	~~VOA~~ TOX	SVOC TOX	METALS	Sec. Cond / pH / PEST/PCB	CN	Mercury / HERB	Total phenols / TPH	Cl + Sulf	Cond, pH, Cl + Sulf		NO. OF CONTAINERS	COMMENTS (Special instructions, cautions, etc.)
MW-114		6-8-95	1430	N/A	water			1		1	1	1	1			5	
MW-14-R		↓	1400	↓	↓	2	1	1		1	1	1		1		8	Rinsate
MW-14A		↓	1430	↓	↓	2	1	1		1	1	1		1		8	
MW-14B		↓	1430	↓	↓	2	1		1							4	
MW-14C		↓	1430	↓	↓	2	1		1							4	
MW-14D		↓	1430	↓	↓	2	1		1						KKS	4	

KKS

	VOA TOX	SVOC TOX	METALS	PEST/PCB	CN	HERB	TPH	Cl + Sulf	Cond, pH, Cl + Sulf	
VOA Vial	X									
Glass Bottle		X					X			
Plastic Bottle			X	X	X	X		X	X	
Preservative	A E	A E	A D	A	A F	A D	A E	A	A	
Container Volume	40 ml	250 ml	1 L	500 ml	1 L	500 ml	1 L	500 ml	1 L	

Sampled and Relinquished by
Sign [signature]
Print Kerry Smith
Firm Parsons ES
Date 6-9-95 Time 1400

Received by
Sign
Print
Firm
Date Time

Relinquished by
Sign
Print
Firm
Date Time

Received by
Sign
Print
Firm
Date Time

Evidence Samples tampered with? ☐ No ☐ Yes
If Yes, explain in remarks.

PRESERVATION KEY:
A - Ice
B - Filtered
C - Acidified with HCl
D - Acidified with HNO_3
E - Acidified with H_2SO_4
F - NaOH + Ascorbic
G - Other

REMARKS: (Sample storage, nonstandard sample bottles)
preserve metals + mercury upon receiving

Cooler #:

ESB - Form COC1 White - return with data Yellow - lab copy Pink - Sampler copy

APPENDIX B

QUALITY ASSURANCE/QUALITY CONTROL DATA

1. Sample Delivery Group Number 51803
    A. Inorganic Analysis QA/QC Data
    B. Metal Analysis QA/QC Data
2. Sample Delivery Group Number 51796
    A. Inorganic Analysis QA/QC Data
    B. Metal Analysis QA/QC Data

1. SAMPLE DELIVERY GROUP NUMBER 51803

A. INORGANIC ANALYSIS QA/QC DATA

Inchcape Testing Services
Aquatec Laboratories

Laboratory Locations
55 South Park Drive
Colchester, VT 05446

75 Green Mountain Drive
South Burlington, VT 05403

150 Herman Melville Boulevard
New Bedford, MA 02740

Analytical Report

Parsons Engineering Science
Prudential Center
Boston, MA 02199

Attention : Mike Duchesneau

Date : 06/29/95
ETR Number : 51803
Project No.: 93206
No. Samples: 6
Arrived : 06/10/95
P.O. Number: *

Case:93206 SDG:51803

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater.
All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
260264	MW454C:06/08/95 (Water)	
415.1	Organic Carbon, Total	0.9
450.1	Organic Halides, Total	<0.02
120.1	Conductivity (umhos/cm)	832
9040	pH (std. units)	7.24
260265	MW454D:06/08/95 (Water)	
415.1	Organic Carbon, Total	0.9
450.1	Organic Halides, Total	<0.02
120.1	Conductivity (umhos/cm)	844
9040	pH (std. units)	7.26
260266	MW114:(Water)	
9250	Chloride, Total	17.8
9065	Phenols, Total	<0.005
9036	Sulfate, Total	319

Comments/Notes

pH was analyzed on 06/10/95.
Conductivity was analyzed on 06/13/95.
Chloride was analzyed on 06/14/95.
TOC was analyzed on 06/16/95.
TOX was analyzed on 06/21/95.
Sulfate was analyzed 06/27/95.
Phenols were analyzed on 06/16/95.

< Last Page > Submitted By : Aquatec Inc.

Quality Control Summary

Project No.: 93206 **ETR No.:** 51803 **SDG No.:** 51803 **Units:** mg/L

Parameter	Method Preparation Blank	Laboratory Control Sample Found Value	Laboratory Control Sample True Value	Laboratory Control Sample % Recovery
Chloride	<0.5	166	182	91.2
Conductivity (umhos/cm)		1371	1413	97.0
Phenol	<0.005	0.785	0.786	99.9
Sulfate	<5	139	146	95.2
Sulfate	<5	138	146	94.5
Total Organic Carbon	<0.5	8.48	8.86	95.7
TOX	<0.02	0.09	0.10	90.0
pH (std units)		5.98	6.00	99.7

1. SAMPLE DELIVERY GROUP NUMBER 51803

B. METAL ANALYSIS QA/QC DATA

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206 SAS No.: _____ SDG No.:51803_

SOW No.: ILM02.1

EPA Sample No.	Lab Sample ID
_MW114_____	_260266_____
_MW454A_____	_260262_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

_____

_____

_____

_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: _____

Date: _____ Title: _____

3
BLANKS

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206_ SAS No.: _____ SDG No.: 51803_

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	19.6	B	32.2	B	27.3	B	29.9	B	31.801	B	P
Antimony	2.1	U	2.1	U	2.1	U	2.1	U	-2.658	B	P
Arsenic	2.5	U	-3.3	B	2.5	U	-3.0	B	2.492	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	1.994	U	P
Beryllium	-0.1	B	-0.1	B	-0.1	B	0.0	U	-0.159	B	P
Cadmium	0.2	B	0.2	U	0.3	B	0.4	B	0.303	B	P
Calcium	56.4	U	56.4	U	56.4	U	56.4	U	56.226	U	P
Chromium	0.8	U	0.8	U	0.8	U	0.8	U	0.798	U	P
Cobalt	1.1	U	1.1	U	1.1	U	1.1	U	1.097	U	P
Copper	-1.2	B	-1.3	B	-1.2	B	-1.2	B	1.097	U	P
Iron	24.4	U	24.4	U	24.4	U	24.4	U	24.325	U	P
Lead	1.5	U	1.5	U	1.5	U	1.5	U	1.495	U	P
Magnesium	46.8	U	46.8	U	46.8	U	46.8	U	46.655	U	P
Manganese	0.2	U	0.2	U	0.2	U	0.2	B	0.199	U	P
Mercury	0.0	U	0.0	U	0.0	U	0.0	U	0.030	U	CV
Nickel	1.6	U	1.6	U	1.6	U	1.6	U	1.595	U	P
Potassium	48.2	U	48.2	U	48.2	U	48.2	U	48.051	U	P
Selenium	3.0	U	3.2	B	3.0	U			3.509	B	P
Silver	1.2	U	1.2	U	1.2	U			1.196	U	P
Sodium	360.0	U	360.0	U	360.0	U	360.0	U	358.887	U	P
Thallium	4.7	U	4.7	U	4.7	U	4.7	U	4.685	U	P
Vanadium	1.1	U	1.1	U	1.1	U	1.1	U	1.097	U	P
Zinc	1.6	U	1.6	U	1.6	U	1.6	U	1.595	U	P
Cyanide	10.0	U	10.0	U	10.0	U	10.0	U	5.000	U	AS

3
BLANKS

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206_ SAS No.: _____ SDG No.: 51803_

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			25.1	B							P
Antimony			2.1	U							P
Arsenic			2.5	U							P
Barium			2.0	U							P
Beryllium			-0.1	B							P
Cadmium			0.2	U							P
Calcium			56.4	U							P
Chromium			0.8	U							P
Cobalt			1.1	U							P
Copper			-1.9	B							P
Iron			24.4	U							P
Lead			1.5	U							P
Magnesium			46.8	U							P
Manganese			0.2	U							P
Mercury											NR
Nickel			1.6	U							P
Potassium			50.5	B							P
Selenium	3.0	U	3.0	U	3.0	U					P
Silver	1.2	U	1.2	U	1.2	U					P
Sodium			360.0	U							P
Thallium			4.7	U							P
Vanadium			1.1	U							P
Zinc			1.6	U							P
Cyanide											NR

7
LABORATORY CONTROL SAMPLE

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206_ SAS No.: _____ SDG No.: 51803_

Solid LCS Source: _____

Aqueous LCS Source: VENTURES____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	51000.0	48750.00	95.6						
Antimony	2000.0	1975.00	98.8						
Arsenic	1050.0	1057.00	100.7						
Barium	500.0	481.40	96.3						
Beryllium	500.0	502.50	100.5						
Cadmium	525.0	524.90	100.0						
Calcium	50000.0	49130.00	98.3						
Chromium	500.0	477.60	95.5						
Cobalt	500.0	475.30	95.1						
Copper	500.0	473.70	94.7						
Iron	50500.0	49070.00	97.2						
Lead	1015.0	951.10	93.7						
Magnesium	50000.0	47950.00	95.9						
Manganese	500.0	484.70	96.9						
Mercury									
Nickel	500.0	450.20	90.0						
Potassium	50000.0	47950.00	95.9						
Selenium	25.0	26.62	106.5						
Silver	500.0	487.60	97.5						
Sodium	50000.0	49960.00	99.9						
Thallium	50.0	50.93	101.9						
Vanadium	500.0	492.50	98.5						
Zinc	500.0	481.50	96.3						
Cyanide									

2. SAMPLE DELIVERY GROUP NUMBER 51796

A. INORGANIC ANALYSIS QA/QC DATA

Inchcape Testing Services
Aquatec Laboratories

Laboratory Locations
55 South Park Drive
Colchester, VT 05446

75 Green Mountain Drive
South Burlington, VT 05403

150 Herman Melville Boulevard
New Bedford, MA 02740

Analytical Report

Parsons Engineering Science
Prudential Center
Boston, MA 02199

Attention : Mike Duchesneau

Date : 06/29/95
ETR Number : 51796
Project No.: 93206
No. Samples: 22
Arrived : 06/10/95
P.O. Number: *

Case:93206 SDG:51796

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater.
All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
260229	MW453C:06/08/95 (Water)	
415.1	Organic Carbon, Total	0.9
450.1	Organic Halides, Total	<0.02
120.1	Conductivity (umhos/cm)	1360
9040	pH (std. units)	7.43

Comments/Notes

Conductivity was analyzed on 06/12/95.
Chloride was analyzed on 06/14/95.
pH was analyzed on 06/10/95.
TOX was analyzed on 06/21/95.
TOC was analyzed on 06/16/95.
Sulfate was analyzed on 06/23/95.
Phenols were analyzed on 06/15/95 and 06/16/95.

< Last Page > Submitted By : Aquatec Inc.

Quality Control Summary
Project No.: 93206 ETR No.: 51796 SDG No.: 51796 Units: mg/L

Parameter	Method Preparation Blank	Laboratory Control Sample Found Value	Laboratory Control Sample True Value	Laboratory Control Sample % Recovery
Chloride	<0.5	179	182	98.4
Conductivity (umhos/cm)		1400	1413	99.1
Phenol	<0.005	0.776	0.786	98.7
Phenol	<0.005	0.785	0.786	99.9
Sulfate	<5	135	146	92.5
Sulfate	<5	138	146	94.5
Total Organic Carbon	<0.5	8.40	8.86	94.8
TOX	<0.02	0.09	0.10	90.0
pH (std units)		5.98	6.00	99.7

Quality Control Summary

Project No.: 93206 **ETR No.:** 51796 **SDG No.:** 51796 **Units:** mg/L
Matrix spike and duplicate analysis sample no.: 260223

Parameter	Matrix Spike Sample Result	Sample Result	Duplicate Result	%RPD	Spike Added	% Recovery
Chloride	19.1	10.0	10.0	0.0	10.0	91.0
Conductivity (uhmos/cm)		904	915	1.2		
Phenol	0.020	<0.005	<0.005	---	0.020	100.0
Sulfate	231	129	120	7.2	100	102.0
TOC	3.0	1.1	1.1	0.0	2.0	95.0
TOX	0.10	<0.02	<0.02	---	0.10	100.0
pH (std units)		7.40	7.40	0.0		

2. SAMPLE DELIVERY GROUP NUMBER 51796

B. METAL ANALYSIS QA/QC DATA

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206 SAS No.: _____ SDG No.:51796_

SOW No.: ILM02.1

EPA Sample No.	Lab Sample ID
_MW12A_____	_260210_____
_MW13A_____	_260214_____
_MW14A_____	_260218_____
_MW14R_____	_260222_____
_MW27A_____	_260223_____
_MW27AD_____	_260223DP_____
_MW27AS_____	_260223MS_____
_MW453A_____	_260227_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

_____

_____

_____

_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: _____

Date: _____ Title: _____

3
BLANKS

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206_ SAS No.: _____ SDG No.: 51796_

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	19.6	B	32.2	B	27.3	B	29.9	B	31.801	B	P
Antimony	2.1	U	2.1	U	2.1	U	2.1	U	-2.658	B	P
Arsenic	2.5	U	-3.3	B	2.5	U	-3.0	B	2.492	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	1.994	U	P
Beryllium	-0.1	B	-0.1	B	-0.1	B	0.0	U	-0.159	B	P
Cadmium	0.2	B	0.2	U	0.3	B	0.4	B	0.303	B	P
Calcium	56.4	U	56.4	U	56.4	U	56.4	U	56.226	U	P
Chromium	0.8	U	0.8	U	0.8	U	0.8	U	0.798	U	P
Cobalt	1.1	U	1.1	U	1.1	U	1.1	U	1.097	U	P
Copper	-1.2	B	-1.3	B	-1.2	B	-1.2	B	1.097	U	P
Iron	24.4	U	24.4	U	24.4	U	24.4	U	24.325	U	P
Lead	1.5	U	1.5	U	1.5	U	1.5	U	1.495	U	P
Magnesium	46.8	U	46.8	U	46.8	U	46.8	U	46.655	U	P
Manganese	0.2	U	0.2	U	0.2	U	0.2	B	0.199	U	P
Mercury	0.0	U	0.0	B	0.0	U	0.0	B	0.030	U	CV
Nickel	1.6	U	1.6	U	1.6	U	1.6	U	1.595	U	P
Potassium	48.2	U	48.2	U	48.2	U	48.2	U	48.051	U	P
Selenium	3.0	U	3.2	B	3.0	U			3.509	B	P
Silver	1.2	U	1.2	U	1.2	U			1.196	U	P
Sodium	360.0	U	360.0	U	360.0	U	360.0	U	358.887	U	P
Thallium	4.7	U	4.7	U	4.7	U	4.7	U	4.685	U	P
Vanadium	1.1	U	1.1	U	1.1	U	1.1	U	1.097	U	P
Zinc	1.6	U	1.6	U	1.6	U	1.6	U	1.595	U	P
Cyanide	10.0	U	10.0	U	10.0	U			5.000	U	AS

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5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MW27AS

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206_ SAS No.: _____ SDG No.: 51796_

Matrix (soil/water): WATER_ Level (low/med): LOW___

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	2038.4692		25.5454	B	1982.95	101.5		P
Antimony	75-125	502.4787		2.0825	U	495.74	101.4		P
Arsenic	75-125	2061.2731		2.4792	U	1982.95	103.9		P
Barium	75-125	2063.2560		80.8707	B	1982.95	100.0		P
Beryllium	75-125	52.0028		0.0397	U	49.57	104.9		P
Cadmium	75-125	51.9135		0.1983	U	49.57	104.7		P
Calcium									NR
Chromium	75-125	204.5409		0.7933	U	198.29	103.2		P
Cobalt	75-125	489.9861		1.0908	U	495.74	98.8		P
Copper	75-125	243.3076		1.0908	U	247.87	98.2		P
Iron	75-125	1081.6974		24.1967	U	991.47	109.1		P
Lead	75-125	481.1620		1.4875	U	495.74	97.1		P
Magnesium									NR
Manganese	75-125	558.5961		45.7457		495.74	103.5		P
Mercury	75-125	1.1400		0.0550	B	0.99	109.6		CV
Nickel	75-125	465.3976		1.9843	B	495.74	93.5		P
Potassium									NR
Selenium	75-125	1991.8699		3.9964	B	1982.95	100.2		P
Silver	75-125	49.1969		1.1900	U	49.57	99.2		P
Sodium									NR
Thallium	75-125	1905.6117		4.6608	U	1982.95	96.1		P
Vanadium	75-125	512.7900		1.0908	U	495.74	103.4		P
Zinc	75-125	494.6460		2.3165	B	495.74	99.3		P
Cyanide	75-125	82.5000		5.0000	U	100.00	82.5		AS

Comments:

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6
DUPLICATES

EPA SAMPLE NO.

MW27AD

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206_ SAS No.: _____ SDG No.: 51796_

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		25.5454	B	31.4221	B	20.6		P
Antimony		2.0825	U	3.3115	B	200.0		P
Arsenic		2.4792	U	2.4757	U			P
Barium		80.8707	B	81.9172	B	1.3		P
Beryllium		0.0397	U	0.0396	U			P
Cadmium		0.1983	U	0.3605	B	200.0		P
Calcium		89061.8802		89948.5047		1.0		P
Chromium		0.7933	U	1.0259	B	200.0		P
Cobalt		1.0908	U	1.6607	B	200.0		P
Copper		1.0908	U	1.0893	U			P
Iron		24.1967	U	25.9457	B	200.0		P
Lead		1.4875	U	1.4854	U			P
Magnesium		65797.3027		66468.6076		1.0		P
Manganese	14.9	45.7457		56.4270		20.9		P
Mercury		0.0550	B	0.0300	U	200.0		CV
Nickel		1.9843	B	2.7659	B	32.9		P
Potassium	4958.4	8563.0702		8672.0143		1.3		P
Selenium		3.9964	B	2.9709	U	200.0		P
Silver		1.1900	U	1.1884	U			P
Sodium	4958.4	15975.8033		16300.2575		2.0		P
Thallium		4.6608	U	4.6544	U			P
Vanadium		1.0908	U	1.6914	B	200.0		P
Zinc		2.3165	B	2.2549	B	2.7		P
Cyanide		5.0000	U	5.0000	U			AS

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LABORATORY CONTROL SAMPLE

Lab Name: ITS_AQUATEC_LABORATORIES_ Contract: 93206_____

Lab Code: AQUAI_ Case No.: 93206_ SAS No.: _____ SDG No.: 51796_

Solid LCS Source: _____

Aqueous LCS Source: VENTURES____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	51000.0	48750.00	95.6						
Antimony	2000.0	1975.00	98.8						
Arsenic	1050.0	1057.00	100.7						
Barium	500.0	481.40	96.3						
Beryllium	500.0	502.50	100.5						
Cadmium	525.0	524.90	100.0						
Calcium	50000.0	49130.00	98.3						
Chromium	500.0	477.60	95.5						
Cobalt	500.0	475.30	95.1						
Copper	500.0	473.70	94.7						
Iron	50500.0	49070.00	97.2						
Lead	1015.0	951.10	93.7						
Magnesium	50000.0	47950.00	95.9						
Manganese	500.0	484.70	96.9						
Mercury									
Nickel	500.0	450.20	90.0						
Potassium	50000.0	47950.00	95.9						
Selenium	25.0	26.62	106.5						
Silver	500.0	487.60	97.5						
Sodium	50000.0	49960.00	99.9						
Thallium	50.0	50.93	101.9						
Vanadium	500.0	492.50	98.5						
Zinc	500.0	481.50	96.3						
Cyanide									