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EBASCO SERVICES INCORPORATED

150 Chubb Avenue, Lyndhurst, NJ 07071-3586, (201) 460-6419

EBASCO

Cost Doc
NL
(Results)

July 19, 1990
NL-DR-90-07

Mr. Michael Gilbert
Project Manager
US Environmental Protection Agency
26 Federal Plaza
New York, NY 10278

Subject: REM III PROGRAM - EPA CONTRACT NO. 68-01-7250
WORK ASSIGNMENT NO. 39-2661
NL INDUSTRIES
COMPARATIVE SUMMARY OF PHASE II ANALYTICAL RESULTS

Dear Mr. Gilbert:

As specified in its Work Plan, enclosed is Ebasco's summary comparison of USEPA and NL Industries data for the Phase II split samples collected at the Pedricktown, New Jersey site and surrounding area. Phase I comparative analytical results were included in Ebasco's Final RI Oversight Summary Report submitted [illegible]

The Phase II split samples were analyzed for USEPA through the Contract Laboratory Program (CLP). NL Industries' samples were analyzed by O'Brien and Gere (OBG) Laboratories. Based upon a review of the tabulated data the OBG and CLP analytical results appear to be in relative agreement with each other for the matrices sampled.

Please contact me should you have any questions on the enclosed information or wish to discuss matters relating to NL Industries' Draft RI Report. I look forward to meeting you in Edison on the morning of July 26th to address NJDEP's comments on the RI Report.

Very truly yours,

David B. Rubin

David B. Rubin
Site Manager

Enclosures

cc: R T Fellman (w/attachment)
D R Sachdev (w/attachment)
H Worchel (w/attachment)

bcc: L Weilgolewski (w/attachment) File: 311,1.8.1

NL INDUSTRIES OVERSIGHT
GROUNDWATER ANALYSES
PHASE II AUGUST, 1989

EBAS=Ebasco Services Inc.
OBG=Obrien & Gere Engineers

LOCATIONS:	EBAS	OBG	EBAS	OBG	EBAS	OBG
	NL-GW-II-1R		NL-GW-II-12		NL-GW-II-KS	
	(OBG WELL 1R)	(OBG WELL 1R)	(OBG WELL 12)	(OBG WELL 12)	(OBG WELL KS)	(OBG WELL KS)
Well Depth/Aquifer:	32.0'/WATER TABLE		78.2'/1ST C[illegible] AQ		17.8'/WATER TABLE	
INORGANICS (mg/L)						
Sulfate	2500	2300	<5	<1	1600	1300
RADIONUCLIDES (pCi/L)						
Lead 210	NA	NA	NA	NA	<2 NV	<5
Radium 226					<0.1 NV	<1
Radium 228					<2 NV	1.7+/-0.5
Thorium 232					<0.1 NV	<0.3
Thorium 230					<0.2 NV	28.0+/-3.0
Thorium 228					1.5 +/- 0.2 NV	<6
Uranium 238					1.8 +/- 0.2 NV	1.1+/-0.2
Uranium 235					<0.1 NV	<0.1
Uranium 234					2.1 +/- 0.2 NV	1.3+/-0.2
Potassium 40					<100 NV	<60
Cesium 137					<6 NV	<3
Gross Alpha					21	<20.0
TRACE METALS: (ug/L)						
Arsenic	NA	NA	NA	NA	4.7 BJ	NA
Cadmium	3.00 B	3	1.40 U	<1	99.8 J	79
Calcium	NA	NA	NA	NA	78200 J	NA
Chromium	NA	NA	NA	NA	16.2 J	16
Copper	NA	NA	NA	NA	133 J	92
LEAD	14.60 J	<5	1.50 U	<1	2130 J	2350
Nickel	NA	NA	NA	NA	261 J	NA
Silver	NA	NA	NA	NA	1.6 UJ	NA
Zinc	NA	NA	NA	NA	2740 J	NA

NL INDUSTRIES OVERSIGHT
GROUNDWATER ANALYSES
PHASE II AUGUST, 1989

	EBAS	OBG	EBAS	OBG	EBAS	OBG
	NL-GW-II-SD		NL-GW-II-CR2		NL-RW-II-PW3	
	(OBG WELL SD)	(OBG WELL SD)	(OBG WELL CR2)	(OBG WELL CR2)	(RESIDENTIAL WELL 3)	PW3
Well Depth/Aquifer:	29.0'/WATER TABLE		33.5'/WATER TABLE		UNKNOWN/WATER TABLE	
INORGANICS (mg/L)						
Sulfate	27000	24000	<10	<3	NA	NA
RADIONUCLIDES:						
(pCi/L)						
Gross Alpha	524.2	570.0+/-180	NA	NA	NA	NA
Gross Beta	228.0	580.0+/-170.0	NA	NA	NA	NA
TRACE METALS:						
(ug/L)						
Arsenic	190 J	NA				
Cadmium	906 J	963	1.40 U	<1	NA	<1
Calcium	281000 J	NA	NA	NA	NA	NA
Chromium	3730 J	4340	NA	NA	NA	NA
Copper	4220 J	4680	NA	NA	NA	NA
LEAD	95.7 J	8	1.50 U	6	1.60 BJ	1
Nickel	2290 J	2480	NA	NA	NA	NA
Silver	1.6 UJ	37	NA	NA	NA	NA
Thallium	8570 J	NA	NA	NA	NA	NA
Zinc	8570 J	9690	NA	NA	NA	NA

NL INDUSTRI[illegible] OVERSIGHT
GROUNDWATER [illegible]ALYSES
PHASE II OCTOBER, 1989

	EBAS	OBG	EBAS	OBG	EBAS	OBG
	NL-GW-II-13		NL-GW-II-17		NL-GW-II-18	
	(OBG WELL 13)	(OBG WELL 13)	(OBG WELL 1[illegible])	(OBG WELL 17)	(OBG WELL 18)	
Well Depth/Aquifer	110'/1ST CONF AQ		21.0'/WATER [illegible]BLE		54.0'/WATER TABLE	
INORGANICS (mg/L)						
Sulfate	5.0	3	14.0	13	NA	NA
Chloride	3.8	NA	2.5	NA	NA	NA
VOLATILE ORGANICS (ug/L)						
Benzene	NA	NA	NA	NA	1.1J	NA
Trichloroethene					0.2J	NA
Isopropylbenzene					0.1J	NA
Carbon Disulfide					0.1J	NA
1,1,2-Trichloro-1,2,2-ethene					1.4R	NA
RADIONUCLIDES (pCi/L)						
Gross Alpha	<3.0 U	<1.0	11 J	1.0+/-0.4	NA	NA
Gross Beta	4.0 U	1.3+/-0.2	16.7 J	2.1+/-0.4	NA	NA
TRACE METALS:						
(ug/L)						
Arsenic	2.0 U	<1	3.2 B	6	NA	NA
Cadmium	4.0 NJ	<1	5.4 NJ	<1		
Chromium	3.0 U	3	19.6 J	46		
Copper	6.0 U	NA	33.5 J	NA		
LEAD	7.3 J	8	2.9 BN	8		
Nickel	25.0 U	NA	NA	NA		
Selenium	NA	NA	2.0 UJ	NA		
Silver	3.0 U	NA	NA	NA		
Zinc	13.6 B	NA	29.3	NA		
Antimony	26	NA	26.0 U	NA		
Tin	NA	NA	50.0 U	NA		

NL INDUSTRIES OVERSIGHT
SURFACE WATER ANALYSES
PHASE II OCTOBER, 1989

EBAS=Ebasco Services Inc.
OBG=Obrien & Gere Engineers

	Locations							
	EBAS	OBG	EBAS	OBG	EBAS	OBG	EBAS	OBG
INORGANICS	NLI-SW-ES1-II	#ES1	NLI-SW-WS8-II	#WS8	NLI-SW-WS9-II	#WS9	NLI-SW-WS12-II	#WS12
(mg/L)	(EAST STREAM)		(WEST STREAM)		(WEST STREAM)		(WEST STREAM)	
Sulfate	570.0 J	600	800.0	74[illegible]	510.0	460	7.0	9
Chloride	240.0	230	42.0	3[illegible]	44.0	34	12.9	12
Trace Metals (ug/L)								
Antimony	NA	NA	NA	N[illegible]	142.48	79	NA	NA
Arsenic					50.2	60		
Cadmium					16.5 NJ	14		
Chromium					7.4 BJ	16		
Copper					40.4 J	39		
LEAD	1.0 UW	10	366	[illegible]	1080 J	1270	5930	2200
Nickel	NA	NA	NA	[illegible]	25.0 U	NA	NA	NA
Selenium					NA	<10		
Silver					3.0 U	NA		
Zinc					150	162		
Tin					NA	<800		

NL INDUSTRIES OVERSIGHT
SEDIMENT ANALYSES
PHASE II October, 1989

EBAS=Ebasco Services Inc.
OBG=Obrien & Gere Engineers

	LOCATIONS:					
	EBAS	OBG	EBAS	OBG	EBAS	OBG
	NLI-SD-ES1-1 (0-3 in)		NLI-SD-ES1-2 (3-6 in)		NLI-SD-ES1-3 (6-8 in)	
LEAD (mg/kg)	17.4 NJ	13.9	19.2 NJ	[illegible].8	23.5 NJ	28.2
	LOCATIONS:					
	EBAS	OBG	EBAS	OBG	EBAS	OBG
	NLI-SD-WS1-1 (0-3 in)		NLI-SD-WS1-2 (3-6 in)		NLI-SD-WS1-3 (6-12 in)	
LEAD (mg/kg)	1460 J	1350	704 J	[illegible]	182 J	225
	LOCATIONS:					
	EBAS	OBG	EBAS	OBG	EBAS	OBG
	NLI-SD-WS8-1 (0-3 in)		NLI-SD-WS8-2 (3-6 in)		NLI-SD-WS8-3 (6-9 in)	
LEAD (mg/kg)	1430 J	1310	781	490	8.4 NJ	19.6
	LOCATIONS:					
	EBAS	OBG	EBAS	OBG	EBAS	OBG
	NLI-SD-WS12-1 (0-3 in)		NLI-SD-WS12-2 (3-6 in)		NLI-SD-WS12-3 (6-10 in)	
LEAD (mg/kg)	2470 J	1860	753	589	315	140
	LOCATIONS:					
	EBAS		EBAS	OBG	EBAS	OBG
	NLI-SD-WS9-1 (0-3 in)	OBG	NLI-SD-WS9-2 (3-6 in)		NLI-SD-WS9-3 (6-9 in)	
LEAD (mg/kg)	4800 J	6403.9	1310 J	899.1	36.6 NJ	28.9

TRACE METALS (mg/kg)		
Antimony	262 J	477.8
Arsenic	280 J	280.3
Cadmium	17.5 J	21.2
Chromium	40.7 J	49.3
Copper	195 J	187.2
Nickel	54.0 J	NA
Selenium	3.1 BJ	2.7
Tin	43.1 J	<394.1
Zinc	228 J	280.8

NL INDUSTRIES OVERSIGHT
SURFACE SOIL ANALYSES
PHASE II

AUGUST, 1989

EBAS=Ebasco Services Inc.
OBG=Obrien & Gere Engineers

	LOCATIONS:			
	EBAS	OBG	EBAS	OBG
INORGANICS (mg/kg)	NLI-SO-213-18 (18-24 in)		NLI-SO-217-18 (18-24 in)	
LEAD	305 J	891	207 J	231
Trace Metals:				
Antimony	NA	NA	6.8 U	0.6
Arsenic	NA	NA	3.9	2.78
Selenium	NA	NA	68 U	<0.1

N. INDUSTRIES OVERSIGHT
LEACHATE RESULTS AUGUST 1989

EBAS=Ebasco Services, Inc.
OBG=O'Brien & Gere Engineers

	LOCATIONS:			
	EBAS	OBG	EBAS	OBG
	NLI-LE-A-01		NLI-LE-B-01	
	8-15-89		8-15-89	
ORGANICS (mg/L)				
Total Organic Carbon	NA	3,400,000	NA	NA
Total Organic Halogens	NA	<2000	NA	NA
Volatile Organics (ug/L)				
Trichloroethene	NA	NA	0.47 J	NA
Extractables (ug/L)	NA	NA	ND	NA
RADIONUCLIDES (pCi/L)				
Gross Alpha	3720 J	<2000	83	<70
Gross Beta	179 R	<4000	63 J	<100
TRACE METALS (ug/L)				
Aluminum	45100	82500	38 U	<20
Antimony	157000	82700	65.1 J	108
Arsenic	76500	218000	1420	972
Barium	2790 N	492	39.6 R	30
Beryllium	20 U	18	2.0 U	<1
Cadmium	30 U	<20	5.4	<2
Calcium	28900 B	61300	315000	274000
Chromium	241	3470	7.0 U	11
Cobalt	90 U	151	9.0 U	6
Copper	212 B	154	19.3 B	<5
Iron	17300 R	271000	89700	57200
Lead	10 U	<10	260	254
Magnesium	480 U	12400	109000	96900
Manganese	62.4 B	5570	9840	8620
Mercury	20 UJ	<2	0.20 UJ	<2
Nickel	1360	795	70.2	40
Potassium	188000	87900	28800	26500
Selenium	252 R	70	27.4 R	<10
Silver	70 U	102	7.0 U	<2
Sodium	110000000	34000000	3320000	3330000
Thallium	20 UR	<50	2.0 UR	<5
Vanadium	76600	40400	20.9 B	16
Zinc	314	752	26.4	12
Cyanide	10 U	<10	10.0 U	<10

NL INDUSTRIES OVERSIGHT
QUALITY ASSURANCE BLANKS
PHASE II AUGUST, OCTOBER, 1989

EBAS=Ebasco Services Inc.
OBG=Obrien & Gere Engineers

	EBAS NLI-FB-LE (LEACHATE TUBING) 8-16-89	EBAS NLI-FB-8-15 (GROUNDWATER) 8-15-89	EBAS NLI-FB-8-16 (GROUNDWATER) 8-16-89	EBAS NLI-FB-8-17 (GROUNDWATER) 8-17-89	EBAS NLI-FB-10-17 (GROUNDWATER) 10-17-89	EBAS NLI-FB-10-17 (SURFACE WATER) 10-17-89	EBAS NLI-FB-10-17 (SEDIMENT) 10-17-89
INORGANICS/ ORGANICS (mg/L)							
Sulfate	NA	<5	NA	NA	1.0	1.0	NA
Chloride	NA	NA			<0.5	NA	
Total Organic Carbon	NA	NA			NA		
Total Organic Halogens	NA	NA					
RADIONUCLIDES (pCi/L)							
Gross Alpha	1.0 U	NA					
Gross Beta	1.0 U						
TRACE METALS (ug/L)							
Aluminum	38.0 U						
Antimony	38.0 U						
Arsenic	3.5 B			1.6 UJ			
Barium	3.0 UR			NA			
Beryllium	2.0 U	1.40 U	1.40 U	NA			
Cadmium	3.0 U	NA	NA	1.8 UJ			
Calcium	95.4 B			28.5 B			
Chromium	7.0 U			2.8 UJ			
Cobalt	9.0 U			NA			
Copper	8.6 B			6.9 BJ			
Iron	23.1 B			NA			
LEAD	1.0 U	1.50 U	1.50 U	6.5 J	1.0 U	1.0 U	1.0 U
Magnesium	48.0 U	NA	NA	NA	NA	NA	NA
Manganese	2.0 U			NA			
Mercury	0.20 UJ			NA			
Nickel	10.0 U			11.4 BJ			
Potassium	497 B			NA			
Selenium	6.1 R			NA			
Silver	7.0 U			2.2 BJ			
Sodium	409 B			NA			
Thallium	2.0 U			NA			
Vanadium	10.0 U			NA			
Zinc	8.0 U			3.0 BJ			
Cyanide	10.0 U			NA			

NL INDUSTRIES OVERSIGHT
QUALITY ASSURANCE BLANKS (cont'd)
PHASE II AUGUST, OCTOBER, 1989

EBAS=Ebasco Services Inc.
OBG=Obrien & Gere Engineers

	EBAS NLI-DI-II-01 (DI WATER) 8-17-89	EBAS NLI-DI-II-02 (DI WATER) 8-17-89	EBAS NLI-DI-II-03 (DI WATER) 8-17-89	EBAS NLI-DI-II-04 (DI WATER) 8-17-89	EBAS NLI-DI-II-01 (DI WATER) 10-17-89	EBAS NLI-TB-II-01 (TRIP BLANK) 8-15-89	EBAS NLI-TB-II-02 (TRIP BLANK) 10-17-89
VOLATILE ORGANICS (ug/L)							
Trichlorofluoromethane	NA	NA	NA	NA	U	1.25	U
Chloroform				8.3		U	0.1 J
Toluene				NA			0.2 BJ
(P & M) - Xylene				NA			0.1 BJ
EXTRACTABLES (ug/ml)	U	NA	NA	U	NA	NA	NA
ORGANICS/INORGANICS (mg/L)							
Sulfate	<5	<5	<5	NA	<1.0		
Chloride	<2.0	<2.0	<2.0		<0.5		
Total Organic Carbon	NA	NA	NA				
Total Organic Halogens	NA	NA	NA				
RADIONUCLIDES (pCi/L)							
Gross Alpha	1.0 U	1.0 U	1.0 U		<3.0 U		
Gross Beta	1.0 U	1.0 U	1.0 U		<4.0 U		
TRACE METALS (ug/L)							
Arsenic	1.6 UJ	1.6 UJ	1.6 UJ		2.0 U		
Cadmium	1.8 UJ	1.8 UJ	1.8 UJ		4.0 NJ		
Calcium	27.3 B	22.6 B	13.1 B		NA		
Chromium	2.8 UJ	2.8 UJ	2.8 UJ		3.0 U		
Copper	2.1 BJ	1.1 UJ	2.1 BJ		6.0 U		
LEAD	2.3 BJ	0.4 UJ	1.8 BJ		2.5 BJ		
Nickel	13.3 BJ	9.7 UJ	19.0 BJ		25.0 U		
Silver	2.9 BJ	2.9 BJ	2.2 BJ		3.0 U		
Zinc	3.0 BJ	1.3 UJ	1.3 UJ		2.0 U		

DATA REPORTING QUALIFIERS:

U: INDICATES COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED

NA: INDICATES ANALYTE WAS NOT TESTED FOR.

R: INDICATES VALUE WAS REJECTED. GENERALLY THE RESULT OF LAB OR FIELD BLANK CONTAMINATION.

J: INDICATES AN ESTIMATED VALUE.

B: INDICATES ANALYTE WAS FOUND IN THE BLANK AS WELL AS THE SAMPLE.

N: INDICATES SPIKE SAMPLE RECOVERY IS NOT WITHIN CONTROL LIMITS.

NV: INDICATES VALUE WAS NOT VALIDATED.