LAGOON AREA

Groundwater Quality

prepared for:

NORTHEAST SOLITE CORPORATION
Saugerties , New York

prepared by:

Dunn Geoscience Corporation

December 4, 1984

NORTHEAST
SOLITE®
CORPORATION

P. O. BOX 437 • MT. MARION • NEW YORK 12456 • PHONE (914) 246-9571

January 23, 1985

Mr William Sullivan
N.Y. State Dept. of Environmental Conservation
21 S. Putt Corners Road
New Paltz, NY 12561

Re: Groundwater Study at Northeast
Solite Corporation

Dear Mr. Sullivan:

We enclose with this letter 2 copies of a report entitled LAGOON AREA Groundwater Quality, December 4, 1984, which was prepared by our consultant, Dunn Geoscience Corporation.

Please call if you have any questions.

Very truly yours,

JH Bragg

John H. Bragg

JHB/gl
enc

cc: Mr. Bonvell, DGS
Thomas West
David Evans
E.E. Martin

DUNN
GEOSCIENCE CORP.

5 NORTHWAY LANE NORTH •
LATHAM, NEW YORK 12110
(518) 783-8102

December 2, 1984

John Bragg
Northeast Solite Corporation
P.O. Box 437
Mount Marion, New York 12456

Dear John:

Enclosed are three copies of the latest Dunn Geoscience Corporation report entitled Lagoon Area, Groundwater Quality, dated December 4, 1984. This report summarizes our findings concerning the chemistry of groundwater, surface water, and sludge at the lagoon area of Northeast Solite Corporation. Recommendations for additional action during 1985 are included.

Please do not hesitate to call me if you have any questions or comments concerning the substance of this report.

Very truly yours,

Sander

Sander I. Bonvell
Senior Chemist

SIB/cvl
Enclosures
cc: E. Martin, w/copies (2)
D. Evans, w/copy (1)
T. West, w/copy (1)

DUNN GEOSCIENCE CORP.

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LAGOON AREA
GROUNDWATER QUALITY

Northeast Solite Corporation
Saugerties, New York

Prepared for:

John H. Bragg
Vice President
Northeast Solite Corporation

Prepared by:

DUNN GEOSCIENCE CORPORATION

Sander I. Bonvell

Sander I. Bonvell
Senior Chemist

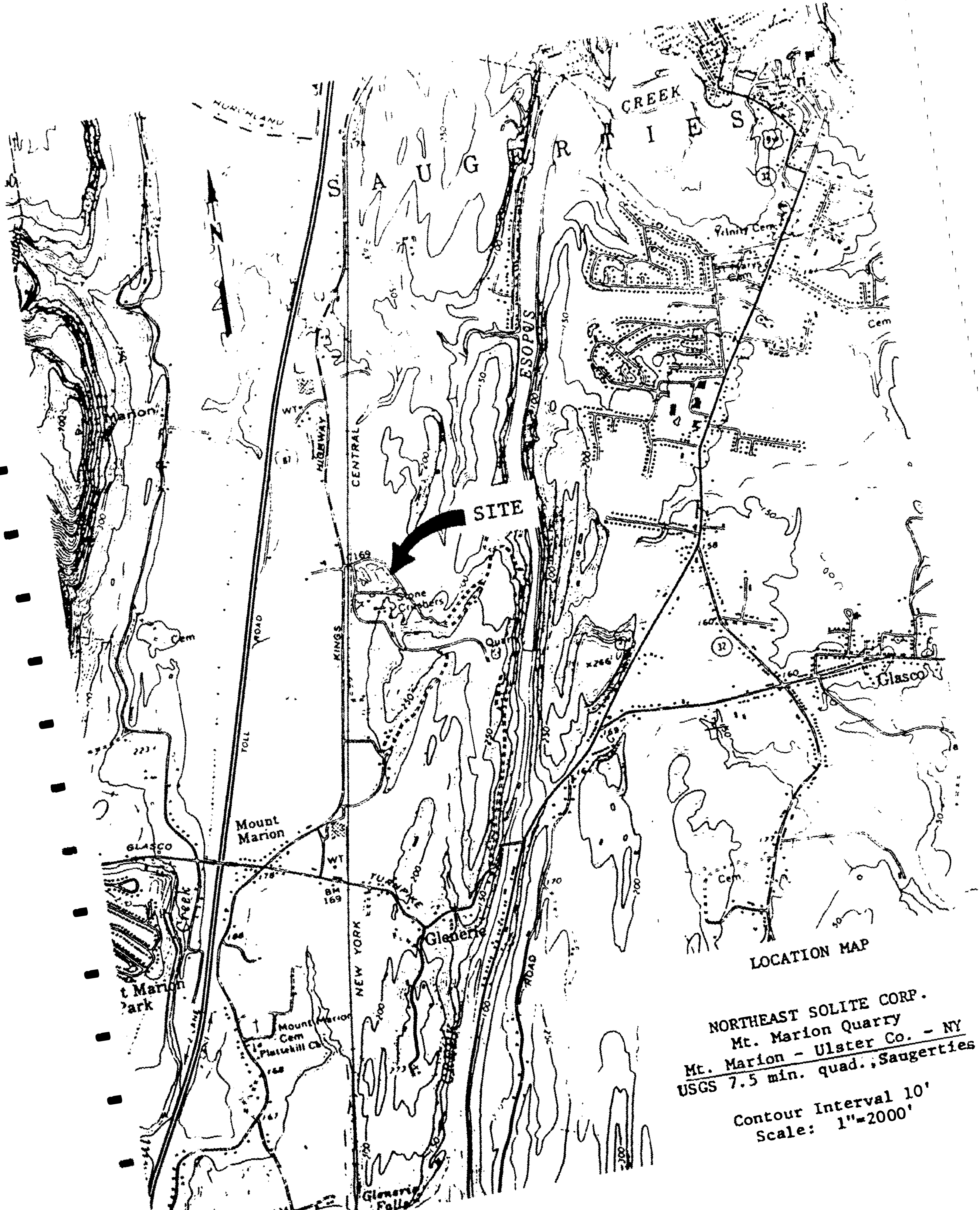
Reviewed by:

James P. Behan, Jr.

James P. Behan, Jr., P.E.
Senior Engineer

Date:

December 4, 1984



LOCATION MAP

NORTHEAST SOLITE CORP.
Mt. Marion Quarry
Mt. Marion - Ulster Co. - NY
USGS 7.5 min. quad., Saugerties

Contour Interval 10'
Scale: 1"=2000'

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EXECUTIVE SUMMARY

Groundwater and surface water monitoring at the Northeast Solite Corporation lagoon area has led to three general observations:

> Firstly, there is no apparent heavy metal groundwater contamination in the lagoons' downgradient monitoring area as evidenced by studies of lead, arsenic, and selenium in both water and soil matrices;
>
> Secondly, there is an apparent zone of groundwater contamination consisting predominantly of elevated chloride levels. This zone exists in the lagoons' downgradient monitoring area approximately 10 to 15 feet below grade;
>
> Thirdly, there is no evidence of groundwater or surface water contamination of organic origin as evidenced by monitoring for purgeable organic compounds, polychlorinated biphenyls, and general semi-volatiles via a hydrocarbon scan.

In view of Northeast Solite's return to using liquid burnable material as a fuel, and to satisfy environmental concerns, a new sampling and analytical monitoring program is recommended.

1.0 INTRODUCTION

This report presents the results of the most recent phase of investigation and monitoring at the lagoon area of the Northeast Solite Corporation (NES) site at Mt. Marion, New York.

This report is preceded by three other major reports that defined the lagoon situation and presented interim results. They are listed below.

Supplementary Report/6NYCRR Part 360 Permit Application: Lagoons and ✓ Fines Storage Area, Dunn Engineering Company, August 24, 1984

Lagoon Area/Monitoring Well Installations and Groundwater Quality Analysis, Dunn Geoscience Corporation, December 1, 1983

Lagoon Area/Monitoring Well Installation and Groundwater Quality Analysis, Dunn Geoscience Corporation, March 13, 1984

2.0 PURPOSE

The purpose of this report is to summarize the results of the sampling and analytical program used to assess groundwater quality in the lagoons area and recommend further action.

Overall groundwater chemistry is discussed and a new sampling and analytical protocol is outlined for Northeast Solite's return to using liquid burnable materials.

3.0 PERSONNEL

This report was prepared by Sander Bonvell, Senior Chemist, and reviewed by James P. Behan, Jr., P.E., Senior Engineer, and William J. Hall, Vice President. The following subcontractor analytical laboratories were used:

Ecological Analysts/Science, Engineering and Technology, Inc.
Sparks, Maryland

Bender Hygienic Laboratory
Albany, New York

Energy Resources Company, Inc.
Cambridge, Massachusetts

4.0 PROJECT SCOPE: SAMPLING AND ANALYTICAL PROTOCOLS

The overall aim of this investigation is to determine the effect the lagoon area has on the quality of groundwater. To this end, the chemistry of groundwater, surface water, lagoon sludge, on-site soils, and raw process materials (coal and shale) were analyzed to provide a broader chemical data base for assessing any possible environmental impact.

4.1 Groundwater

4.1.1 Modifications to Consent Order Groundwater Monitoring

Testing parameters included purgeable (halogenated) hydrocarbons (EPA Method 624), halogenated pesticides and polychlorinated biphenyls (EPA Method 608), a gas chromatographic/mass spectroscopic hydrocarbon scan to detect semi-quantitatively the extractable hydrocarbon matter not detected by the other organic analyses, and a host of inorganic constituents.

This sampling/analytical protocol was performed four times: September 1983; November 1983; January 1984; and April 1984. All but the last results have been reported in the previously cited Dunn Geoscience Corporation reports; the April, 1984 results were submitted as a letter report to John Bragg dated May 22, 1984. This letter is included in Appendix A. Tabulated data for all four reports are shown in Table 1.

In all cases, no organic constituents were ever (chromatographically) detected. All organic parameters were at the non-detected or below method detection limit levels. In some cases there was concern for a few of the inorganic parameters, especially chloride, sulfate, lead, arsenic, selenium and phenols in wells DSP-2 and DSP-3. However, due to insufficient quality assurance at the laboratories and the fact that all downgradient wells were fully screened, the NYSDEC consent order protocol was revised to better assess the groundwater quality.

4.1.2 Cluster Well Monitoring of Groundwater

Because consent order monitoring was inconclusive, DGC recommended a set of cluster wells downgradient of the polishing pond, screened at various depths to determine the vertical horizons of groundwater quality. A group of six such wells was installed during the winter of 1983-1984 and in January, 1984 an experimental sampling and analytical protocol was performed to better define groundwater quality. This protocol and its results were fully discussed in the March 13, 1984 report previously cited. The tabulated results are included in Appendix B. The results were similar to those found during subsequent cluster well testing and are discussed later in this report.

In an April 26, 1984 letter to NES, DGC recommended a new sampling and analytical monitoring program for groundwater quality assessment at the lagoons area of Northeast Solite Corporation. This letter and the protocol are presented in Appendix A. Data from the initial cluster well experiment was also supplied to NYSDEC and after a series of technical meetings, it was mutually and verbally agreed by all parties to adopt the new lagoon protocol in place of the consent order protocol.

An initial investigatory round of three monthly samplings/analyses was performed during June, July, and August of 1984 to determine if the cluster well protocol could more adequately define the groundwater chemistry of the lagoon area. The results of the first two series of tests were submitted as letter reports to NES, dated August 7 and August 24, 1984, respectively. Copies of these are included in Appendix A. The tabulated results of the August, 1984 samplings are found in Appendix B and discussion follows.

4.2 Surface Water

The surface water sites at the lagoon area include two settling ponds and a final polishing pond that are fed with scrubber effluent from the kiln process. As a means of identifying possible potential contaminants from these waters, several analyses have been performed on the polishing pond water to determine its chemical constituents.

4.2.1 Inorganic Monitoring

4.2.1.1 Extraction Procedure Toxicity

The water from the polishing pond has undergone three extraction procedure toxicity analyses involving acidification with acetic acid and filtering via 0.45 micron cellulose prior to analytical work-up. The results of three sampling dates are summarized in Table 2.

4.2.1.2 Absolute Analysis

In January and April of 1984, samples of polishing pond water were analyzed for the inorganic parameters covered under the consent order for the groundwater monitoring wells. These results are presented in Table 3.

4.2.2 Organic Monitoring

In February and April of 1984, waters of the polishing pond were sampled and analyzed for the consent order organic constituents. This included purgeables (EPA 624), polychlorinated biphenyls (EPA 608), and a hydrocarbon scan by gas chromatography/mass spectrometry (NYSDEC).

This protocol was repeated on July 16 and 24, 1984. Results are summarized in Tables 4-6.

4.3 Sludge Analysis

4.3.1 Inorganic - Extraction Procedure Toxicity

On February 17 and July 16, 1984, sludge samples obtained from settling pond dredgings were analyzed for the inorganic parameters in the Extraction Procedure Toxicity analysis. Results of these analyses were presented to Northeast Solite in letters dated March 19 and August 23, 1984, for the February and July protocols, respectively. These letters are found in Appendix A. Tabulated data is presented in Table 7.

4.3.2 Organic Analysis

On September 27-28, 1984 samples were obtained from a large pile of settling pond sludge collected while the NES facility used liquid burnable materials as a fuel. The list of parameters for analysis was chosen to reflect the five categories (F001-F005) under which NES is permitted to burn waste from nonspecific sources as outlined in Federal Register, Vol. 45, No. 98, Sect. 261.31 (5/19/80). This list of parameters is presented in Table 8.

4.4 Soil Analysis

On March 8, 1984 three samples of clay from NES property, unaffected by, and upgradient from, any industrial process were collected by hand auger from one to four feet below grade in an area northeast of the polishing pond. Parameters investigated were phenols, chloride, sulfate, lead, selenium and arsenic.

The results of this investigation were reported to NES in a letter dated April 26, 1984. This letter is found in Appendix A. The results are presented in Table 9.

4.5 Raw Material Analysis: Coal and Shale

As a means of expanding the chemical data base used to define the geochemistry of the lagoons area, samples of shale and coal just prior to kiln feeding were also collected during the March 8 sampling protocol as mentioned in Section 4.4. Results were presented to NES in the same April 26, 1984 letter. The analytical data are listed in Table 9.

5.0 ANALYTICAL RESULTS AND INTERPRETATIONS

In preliminary investigations into the geohydrologic condition of the lagoons' downgradient areas, sampling and analytical schemes have been refined and redefined as more and more data are accumulated. The initial protocol was a broad-based program of organics and inorganics in a NYSDEC order of consent. Several rounds of sampling and analysis of groundwater showed that all the (chromatographically determined) organics and most of the inorganic parameters posed no present or potential threat and would be eliminated from the protocol.

A new sampling protocol was developed by DGC and incorporated into the NES groundwater monitoring. The study involved cluster wells covering zero to sixty feet below grade. In an area approximately 100 feet downgradient of the NES polishing pond, relatively high concentrations of a few parameters have been detected in a zone approximately ten to twenty feet below grade with probable minor dispersion to both upper and lower horizons.

Although the chemical indicators are easily determined, their source cannot be unambiguously identified due to the short time this study has been in progress. The focus of this analytical scheme has been to define the geohydrologic chemical conditions of this area, not to predict the movement or activity of potential contaminants.

Sampling and analytical programs were redeveloped and subcontractor laboratories were changed. The benefit of this change was an increase in the quality control and reliability of the data that could not have been cost-effectively provided previously.

It was initially thought that lead and chloride might be the determining factors of a groundwater problem. Since lead is a listed priority pollutant, assessment of its presence or absence in groundwater is critical. The instrumental approach to lead analysis of water is atomic absorption spectroscopy in the electrothermal atomization mode. This method is sensitive to 1-5 ppb. The groundwater maximum contaminant level is 25 ppb (NYSDEC Part 703). However, AA-spectroscopy is very easily influenced by matrix interferences and one of the greatest interferences in lead determination is chloride due to an intermediate stage in the method where lead is most likely lost as (volatile) lead chloride, thus leading to biased lower results.

Many times this type of interference can be overcome by an analytical spiking scheme called standard additions, but the process is much longer and more costly than the conventional analytical protocol offered by large, high volume laboratories. However, since the localized groundwater chloride-to-lead ratio in the most contaminated well is on the order of one hundred and ninety thousand to one in the 70 ppb lead range, we felt that the needed interference elimination methods were unquestionably warranted.

The experimental cluster well sampling performed in January justified our concerns and this spiking quality control protocol was adopted in all heavy metal analysis for any and all NES protocols performed by DGC.

The extension of this study to the 1984 summer monthly sampling and laboratory testing leads to the conclusion that, although lead salts are an end product accumulation in the lagoons system, lead also appears to be endemic to the area. This is not unexpected given that shale contains more lead than other rocks. Since concentrations of dissolved lead in groundwater are consistently below 10 ppb, even where substantial amounts of lead are bound to soil, the downgradient well cluster area does not appear to have a groundwater lead problem. There is no apparent correlation between the presence or absence of lead in groundwater and its associated solids content.

5.1 Groundwater Quality

Table 1 and its consent order monitoring well data shows that elevated levels for downgradient wells were limited primarily to lead and chloride and to a lesser extent, manganese, selenium and sulfate. In September of 1983, a lead value of 275 ppb was observed in well DSP-2. A split sample of this site was taken concurrently by NYSDEC and yielded a concentration of only 3 ppb. This discrepancy initiated an investigation into the quality control program at both the laboratory used by DGC and the laboratory used by the State. As it turned out, both labs failed to perform sufficient quality control. Neither lab ran standard additions, nor did they perform sufficient spiking to account for the chloride and other matrix interferences. This point was discussed with NYSDEC and it was mutually agreed that this round of sampling for lead analysis (and possibly others) is inconclusive.

Monitoring wells DSP-2 and DSP-3 have a similar chemical make-up. They are high in chlorides and sulfates, with intermittent presence of lead, selenium and manganese. DSP-3 is consistent at 6 ppb cadmium, while DSP-2 ranges as high as 40 ppb cadmium. However, this cadmium data was run under the same conditions as the lead and may fall into the same "inconclusive" category.

To gain further information about the groundwater and its vertical extent of contamination, the cluster of wells described in Section 4.1.2 (and monitored in January 1984) was monitored during June, July and August 1984. These data are presented in Appendix B. Several major results are outstanding.

TABLE 1

Northeast Solite Corporation
Consent Order Monitoring Results

	Polishing Pond				USP-1				DSP-3				DSP-2				DSP-4			
	9/83	11/83	1/84	4/84	9/83	11/83	1/84	4/84	9/83	11/83	1/84	4/84	9/83	11/83	1/84	4/84	9/83	11/83	1/84	4/84
Chloride	--	--	12,100	14,800	--	7	10	14	1,380	2,350	1,870	1,570	1,300	2,400	672	4,360	39	172	252	60
Fluoride	--	--	190	11	--	<0.1	0.3	0.1	0.2	0.17	0.3	0.2	0.1	0.25	0.3	0.2	<0.1	0.29	0.7	0.3
Nitrate-N	--	--	18.2	24	--	0.27	<0.2	1.0	1.1	2.01	246	0.15	1.7	0.4	<0.01	1.35	0.03	0.83	0.07	1.85
Sulfate	--	--	1,850	1,810	--	3,580	4,760	3,630	432	394	360	393	800	489	320	732	408	31	390	199
pH	--	--	2.4	3.1	--	4.6	4.5	3.3	6.5	6.9	6.7	7.2	6.7	7.1	7.1	7.1	6.3	7.3	6.2	7.5
Aluminum	--	--	170,000	101,000	150	1,320	5,950	215,000	70	1,350	11	94	50	872	22	90	70	78	74	82
Arsenic	--	--	410	64	<1	<1	3	90	5	<1	3	<2	70	<1	3	<2	3	<1	<2	2
Cadmium	--	--	77	216	8	7	9	22	2	6	6	6	10	9	3	40	<1	9	7	1
Iron	--	--	69,000	10,300	29	898,000	854,000	254,000	100	240	213	60	150	980	180	120	80	70	60	120
Lead	--	--	1,330	460	18	<1	85	50	60	2	113*	26	275	3	25*	186	9	1	25	6
Manganese	--	--	13,600	16,900	55,100	128,000	3,410	114,000	13	90	40	50	400	360	70	460	65	3,760	7,900	1,040
Nickel	--	--	1,600	1,790	51	802	2,130	1,930	977	103	6	10	1,080	97	8	16	101	41	10	<50
Selenium	--	--	195	19	8	4	14	54					78	6	24	54	10	<2	17	4
Zinc	--	--	2,800	2,790	450	50,100	33,000	20,800					170	260	120	54	80	1,080	1,990	4
Phenols	--	--	10	30	--	60	<10	70					70	60	20	140	40	20	<10	20

Statement about metals < filtered is false

Wet chemistry results (Chloride-Sulfate) are in mg/L (ppm).
Metals results (Aluminum-Zinc) and phenols are in ug/L (ppb).
All metals results are from filtered water samples, 0.45 micrometer cellul
* Run by method of standard additions.

The first is the presence of lead in the soil but its absence in groundwater. Even in wells where unfiltered water samples had a lead as high as 370 ppb, the filtered samples were less than 10 ppb. There does not appear to be any obvious correlation between lead values and seasonal time of sampling or depth of sampling. In fact, the highest unfiltered groundwater lead level of 830 ppb was recorded in the August sampling of upgradient well USP-1A.

There are three possible sources of soil lead in the downgradient area of the polishing pond. The first is natural lead content of the soil. This is not unreasonable given the fact that shale contains substantially more lead than other rocks and appears to be ubiquitous . The second and third sources are contaminating lead from previous discharge practices and possible seepage in the lagoons. However, since lead is not a contributing factor to any groundwater quality degradation, it does not seem pertinent to follow-up groundwater monitoring with a costly soil lead analytical program.

Other metals have been detected in the polishing pond, levels of which are above groundwater standards but far below E. P. Toxicity levels. Arsenic showed up at 70 ppb in well DSP-2 in September 1983 during consent order monitoring. Other downgradient values obtained during cluster well monitoring were 67 and 73 ppb (DSP-2A) and 50 ppb (DSP-2B). However, the upgradient well USP-1A has had observed levels of 28 and 30 ppb. In general, arsenic contamination in groundwater is not evident.

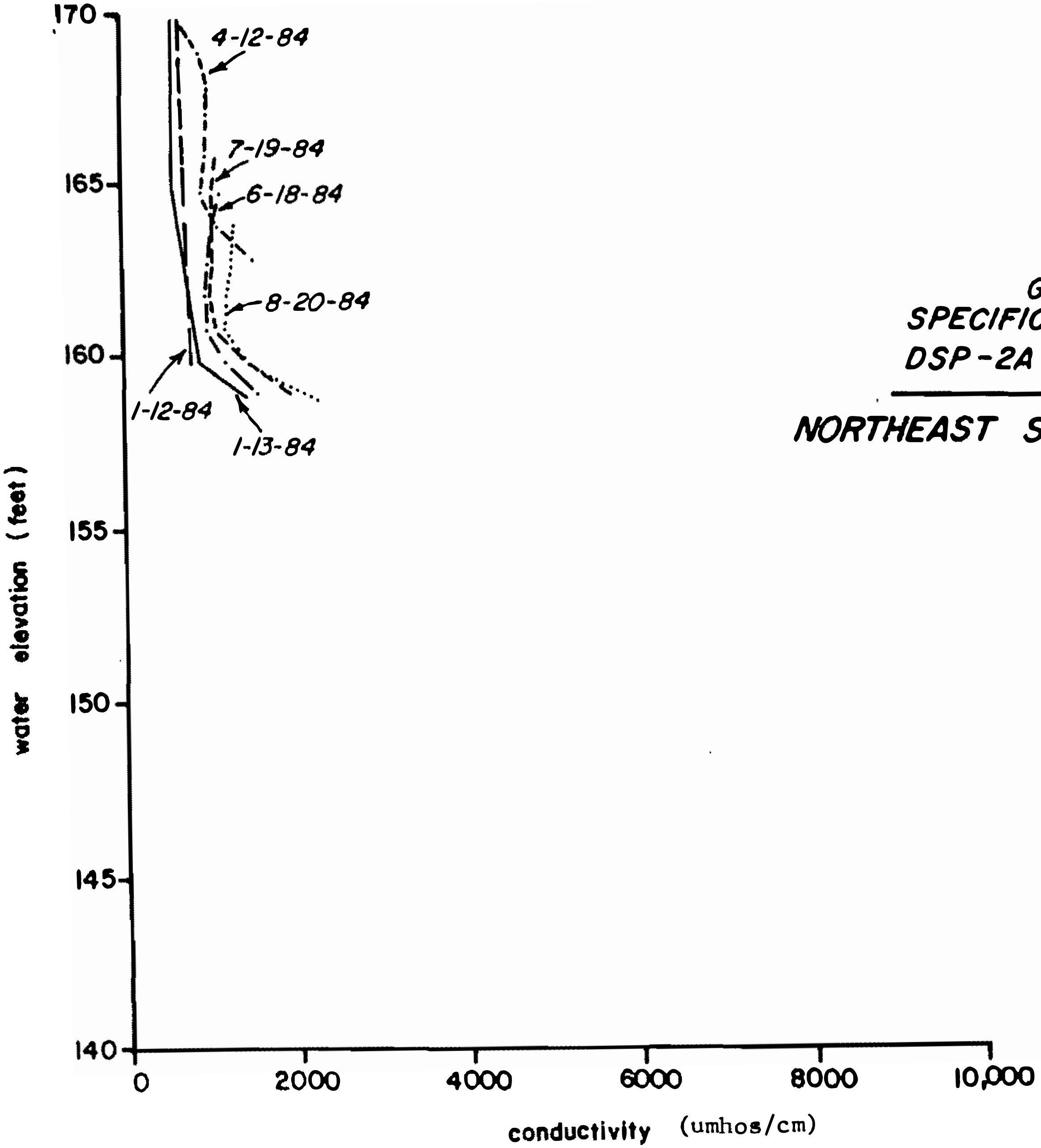
Cadmium has also been observed in well DSP-2 between 3 and 40 ppb; however, this is only tentative. In general, cadmium values are less than 10 ppb. Cadmium was not included in the cluster well protocol.

Manganese, although not considered a heavy (toxic) metal is at high levels in the polishing pond (13-17 ppm) and shows up only in well DSP-4 at elevated levels (1-8 ppm). Monitoring well DSP-4 presents some anomalous results. If contamination from the lagoon system was occurring, then we would expect high chlorides and possibly sulfates. However, chlorides are not in excess of ground water standards; of the seven sampling dates the mean chloride level is only 110±70 ppm. Sulfate levels only exceed groundwater standards twice (September 1983, 408 ppm; January 1984, 390 ppm). Other values are below groundwater MCLs.

Another possible source of high level sulfate may be the coal pile just upgradient of the lagoons. This was evidenced by high levels of iron (as high as 898 ppm), manganese (3-128 ppm), sulfate (3000-5000 ppm) and zinc (as high as 50 ppm) observed in the former upgradient well, USP-1. However, iron does not appear at elevated levels in any downgradient site and soil adsorption may play an important role in iron concentration attenuation.

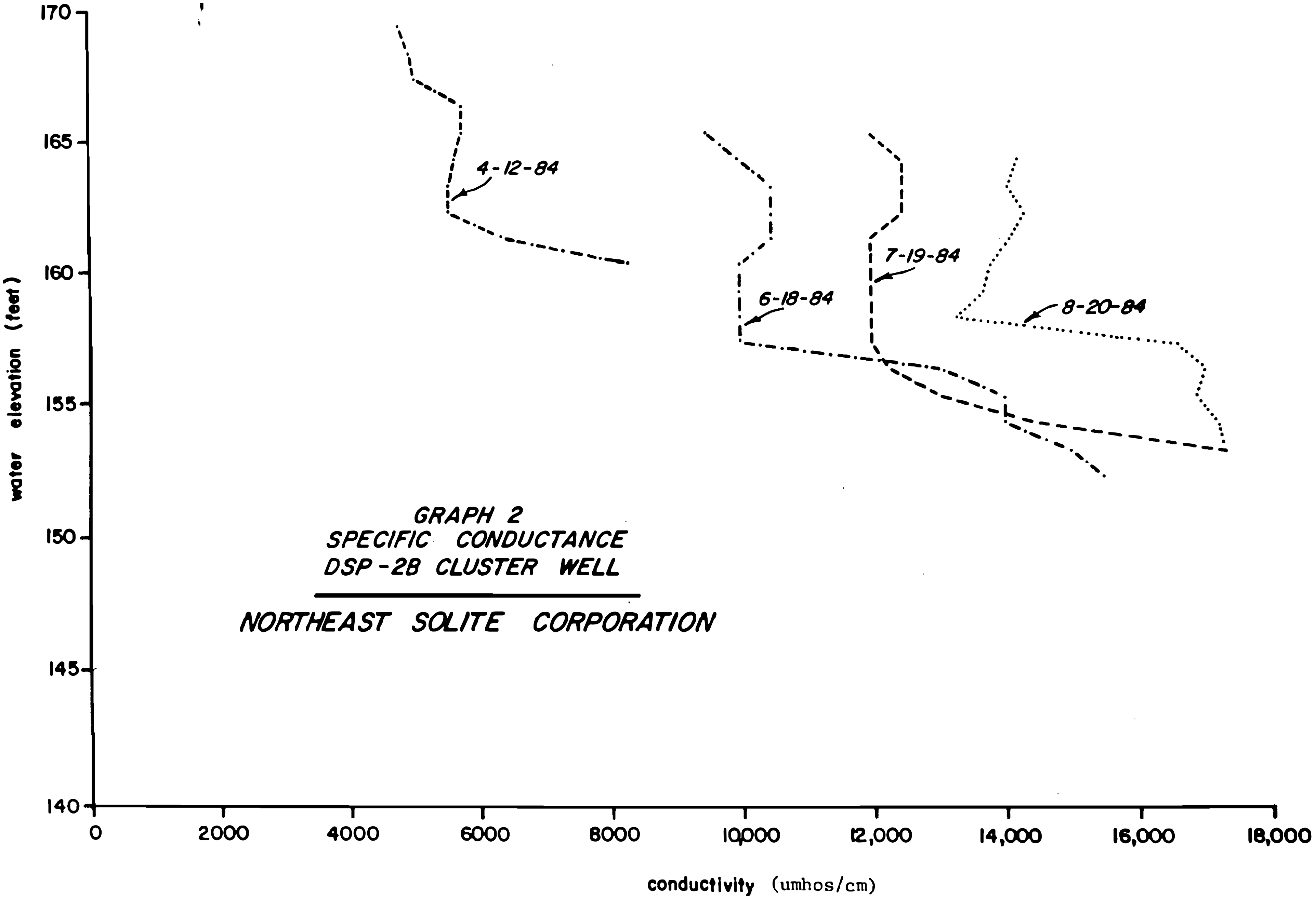
A second major outstanding result is the presence of high conductivities in wells DSP-2B and -2C. This is a result of the high chloride and sulfate concentrations. Wells DSP-2B and -2C show the highest levels of chlorides and sulfates; slightly elevated levels in the other wells probably result from upward or downward vertical dispersion, as well as contributions from the downward vertical component of groundwater flow. These chloride and sulfate levels with their consequent high conductivities result from non-natural sources. They arise from the lagoons system through past surface discharges or past/present seepage from the ponds.

Graphs 1-6 illustrate conductivity versus elevation for the cluster wells. It is evident upon examination that the bulk of contamination lies approximately between elevations 157 feet and



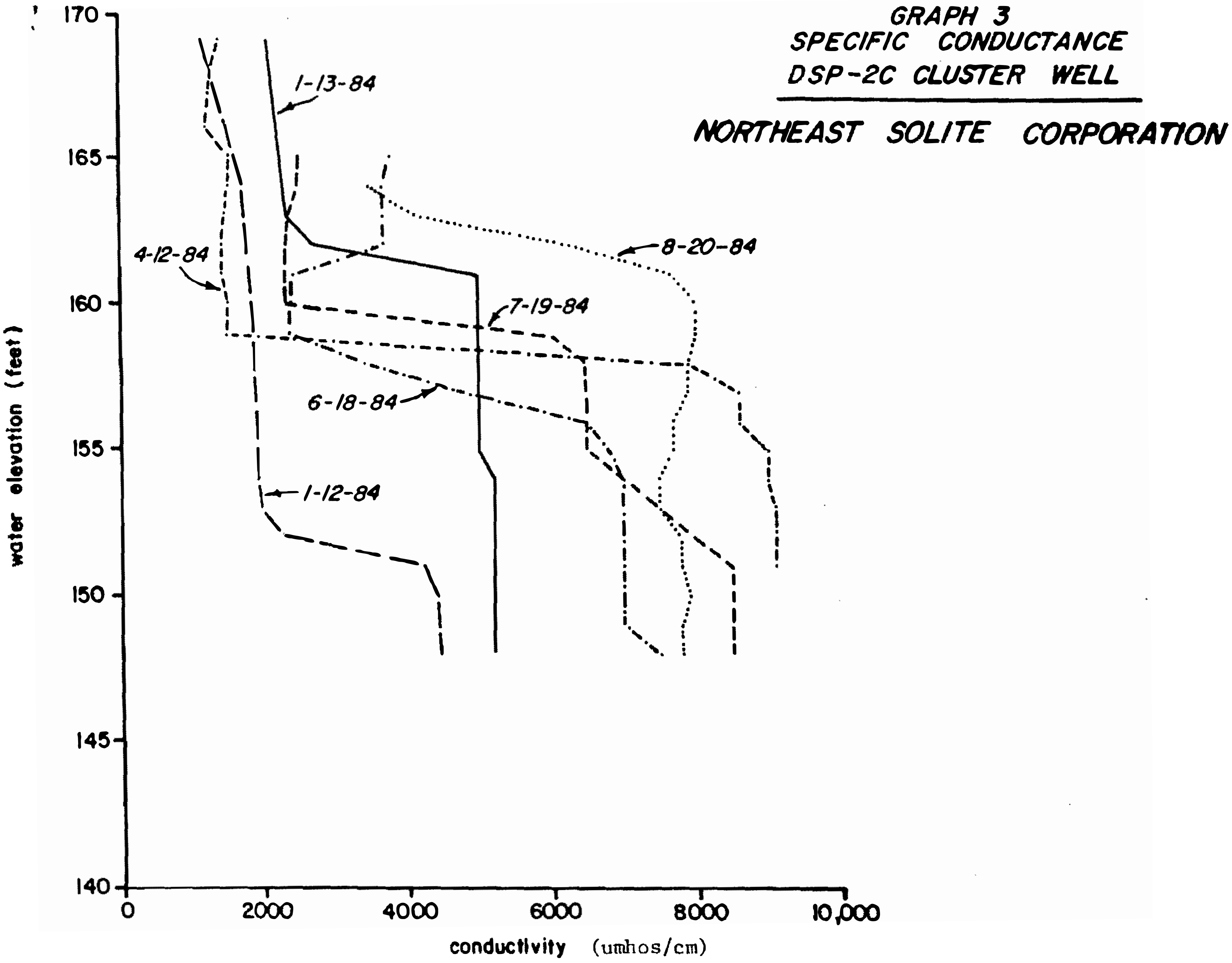
GRAPH 1
SPECIFIC CONDUCTANCE
DSP-2A CLUSTER WELL

NORTHEAST SOLITE CORPORATION



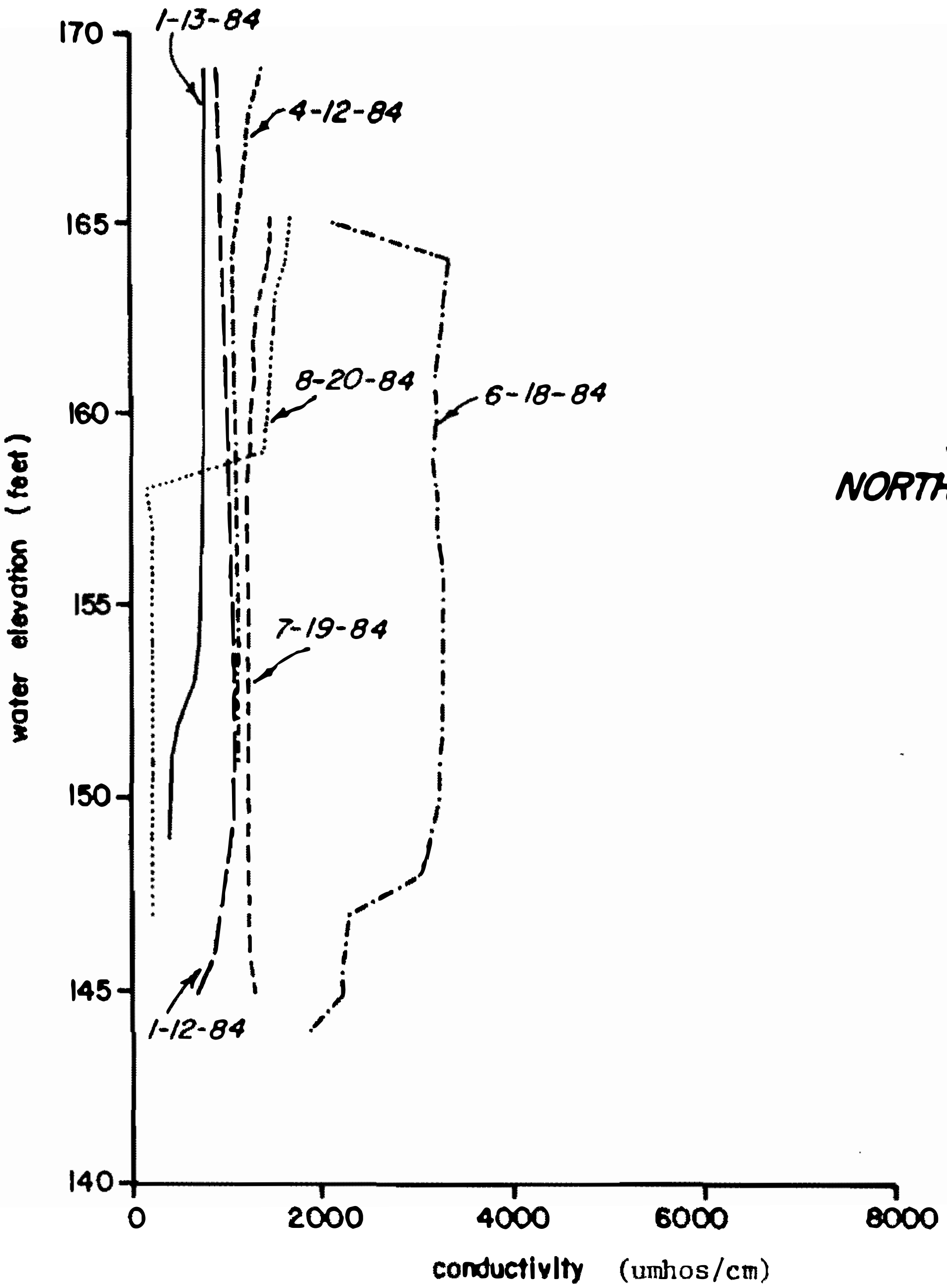
GRAPH 2
SPECIFIC CONDUCTANCE
DSP-2B CLUSTER WELL

NORTHEAST SOLITE CORPORATION



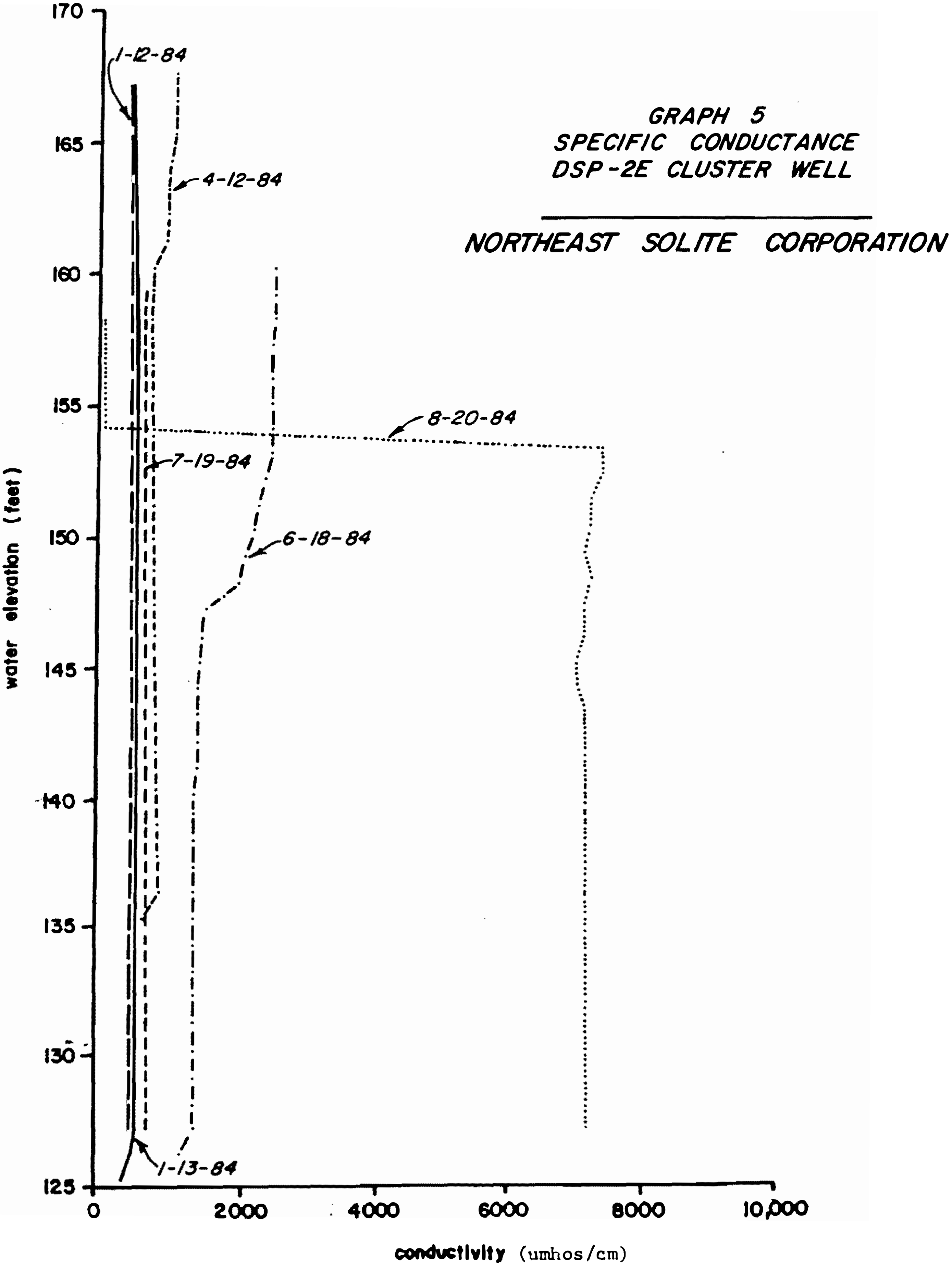
GRAPH 3
SPECIFIC CONDUCTANCE
DSP-2C CLUSTER WELL

NORTHEAST SOLITE CORPORATION



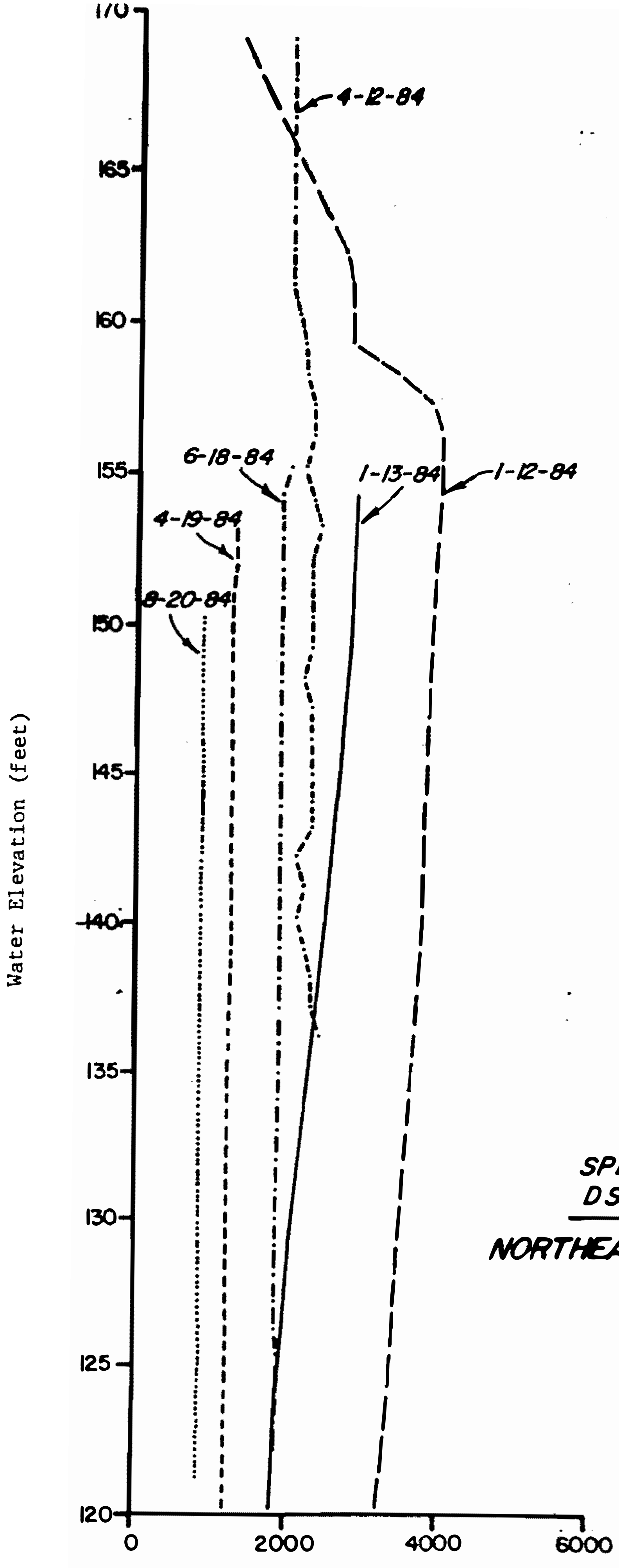
GRAPH 4
SPECIFIC CONDUCTANCE
DSP - 2D CLUSTER WELL

NORTHEAST SOLITE CORPORATION



GRAPH 5
SPECIFIC CONDUCTANCE
DSP-2E CLUSTER WELL

NORTHEAST SOLITE CORPORATION



GRAPH 6
SPECIFIC CONDUCTANCE
DSP - 2F CLUSTER WELL

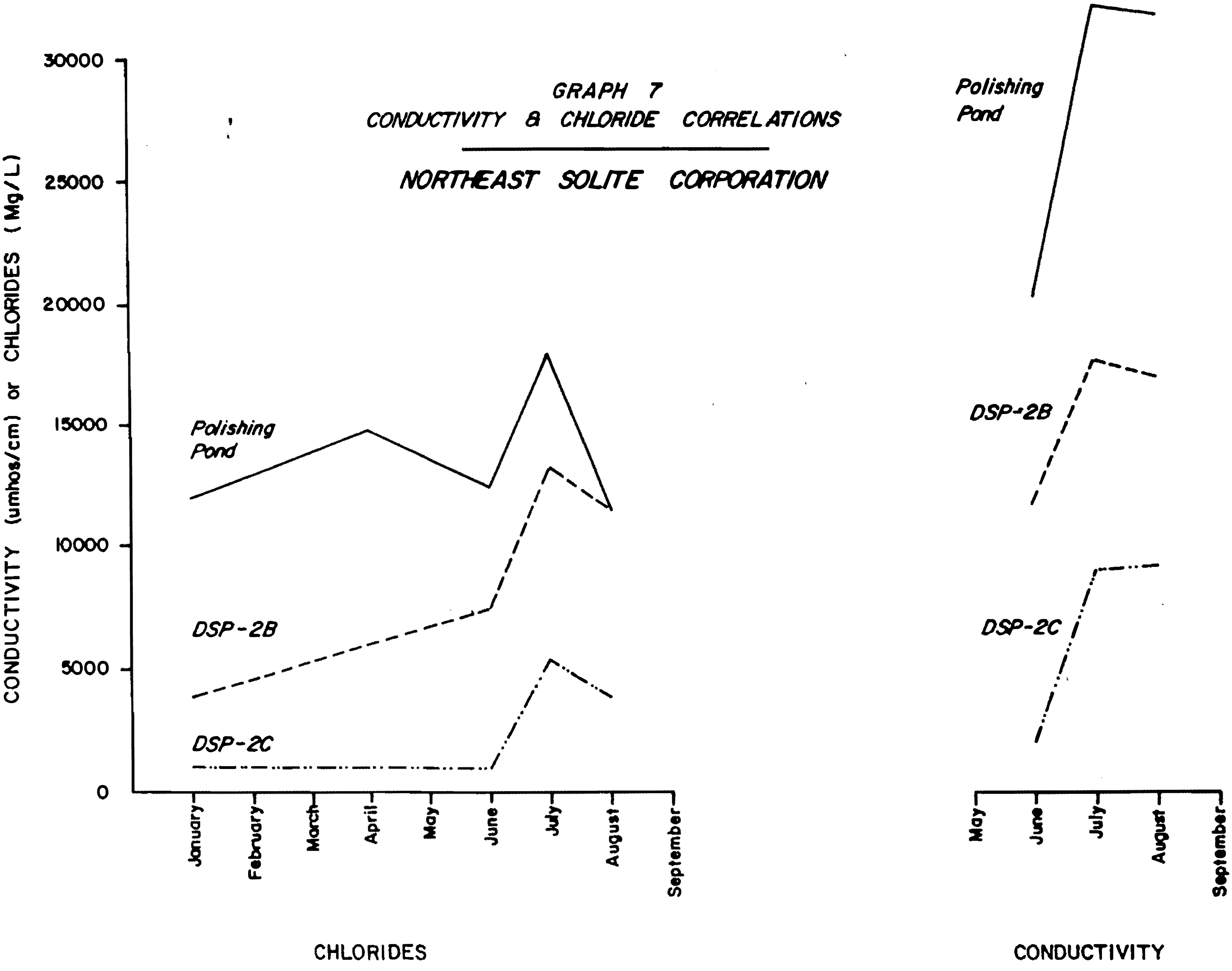
NORTHEAST SOLITE CORPORATION

152 feet. This was shown even before the installation of the DSP-2 cluster when the fully screened wells DSP-2 and DSP-3 were under consent order monitoring and was shown in similar graphs in the March 1984 DGC report to NES.

Initially, it was impossible to differentiate between the two possible sources of chlorides at the depths observed. A contaminant plume brought about by surface discharge would be expected to sink with time, especially given the heavier density of the highly concentrated salt solutions. However, without studying the monitoring wells over an extended period of time, only a "snapshot" of the contaminated zone would be available. Any seepage from the lagoons system containment and consequent dissemination of a plume into groundwater would look almost identical to the surface discharge situation. This assumes that the vertical hydraulic conductivity of the soil was permeable enough to allow surface water to sink to the appropriate depths in the time since surface discharge from the polishing pond was discontinued.

However, the 1984 summer sampling and analytical protocol presented evidence that the source of high chloride levels may stem from seepage from the lagoons system. In cluster wells DSP-2A to DSP-2D, there is a general trend in conductivities with a sudden dramatic rise from June to July and only a slight change from July to August. This pattern is identical for the polishing pond. The rise in conductivity is accompanied by a rise in chloride concentrations both in the wells and in the pond, as illustrated in Graph 7.

GRAPH 7
CONDUCTIVITY & CHLORIDE CORRELATIONS
NORTHEAST SOLITE CORPORATION



5.2 Surface Water Quality

5.2.1 Extraction Procedure Toxicity

The Extraction Procedure Toxicity (E. P. Tox.) analysis is an EPA method designed to mimic the leachability of particular matrices in their habitats. Of the three analyses performed (Table 2) on polishing pond water, May and November 1983 had no reported values exceeding the E.P. Tox. maximum contaminant level or anywhere near it. However, arsenic, cadmium, chromium, lead, selenium and silver have exceeded groundwater standards (NYSDEC 703) at one time or another since the monitoring began.

5.2.2 Absolute Analysis

5.2.2.1 Inorganic

Table 3 shows the results of the inorganic, wet chemistry data of January and April 1984 consent order polishing pond monitoring. Chloride, sulfate, nitrate and fluoride exceed their groundwater standards and the metals parallel the results of the E. P. Toxicity testing. The same heavy metals, except chromium, exceed their groundwater limits. Iron and manganese are also elevated and pH was very low.

5.2.2.2 Organic

Tables 4-6 show that organic contamination has never been evident at the polishing pond. All parameters of the EPA Methods 608 (Pesticides and PCBs) and 624 (Purgeable Halocarbons) were reported at the "not detected" level. Total hydrocarbon scans by GC/MS are consistently below 50 ppb.

TABLE 2

Northeast Solite Corporation
Analytical Results
Extraction Procedure Toxicity Testing
Polishing Pond

Parameter	MCL*	2/25/81	5/5/83	11/30/83
Arsenic	5.0	0.055	0.040	1.14
Barium	100	0.90	1.10	0.09
Cadmium	1.0	3.28	0.07	0.23
Total Chromium	5.0	0.300	0.040	0.134
Lead	5.0	16.6	0.40	0.109
Mercury	0.2	0.0042	0.0015	<0.0002
Selenium	1.0	0.040	0.110	0.070
Silver	5.0	0.07	0.07	0.036
Aluminum	-	40.	<0.20	-
Zinc	-	9.3	0.51	-
Nickel	-	1.87	0.29	-

All values in Mg/L (ppm).

* MCL = (allowable) maximum contaminant level.

TABLE 3

Northeast Solite Corporation
Summary of Inorganic Testing
Polishing Pond

Parameter	January, 1984	April, 1984
Chloride	12,100	14,800
Total Cyanide	<0.01	<0.02
Nitrate-Nitrogen	18.2	24.2
Sulfate	1,850	1,810
Sulfide	<0.7	<1
Aluminum	170	101
Arsenic	0.410	0.064
Barium	0.525	0.828
Cadmium	0.077	0.216
Hexavalent Chromium	0.004	<0.001
Copper	0.782	0.655
Iron	69	10.3
Lead	1.33	0.46
Manganese	13.6	16.9
Mercury	<0.0002	<0.0002
Nickel	1.60	1.79
Selenium	0.195	0.019
Silver	0.028	0.077
Zinc	2.80	2.79
Oil and Grease	<1	<1
Phenols	0.01	0.03
Surfactants	<0.01	<0.15
Fluoride	190	11
pH	2.4	3.1
Gross Alpha	<200	220±70
Gross Beta	220±120	3,100±100

Results expressed in Mg/L except pH (units) and radioactivity (pCi/L).

TABLE 4

Northeast Solite Corporation
Purgeable Organics, EPA Method 624
Polishing Pond

Volatile Compounds		ppb (ug/l)
Acrolein	Less than	10
Acrylonitrile	Less than	10
Benzene	Less than	2
Carbon tetrachloride	Less than	2
Chlorobenzene	Less than	2
1,2-Dichloroethane	Less than	2
1,1,1-Trichloroethane	Less than	2
1,1-Dichloroethane	Less than	2
1,1,2-Trichloroethane	Less than	2
1,1,2,2-Tetrachloroethane	Less than	2
Chloroethane	Less than	2
2-Chloroethylvinyl ether	Less than	10
Chloroform	Less than	2
1,1-Dichloroethene	Less than	2
trans-1,2-Dichloroethene	Less than	2
1,2-Dichloropropane	Less than	2
1,3-Dichloropropene	Less than	2
Ethylbenzene	Less than	2
Methylene chloride	Less than	10
Chloromethane	Less than	2
Bromomethane	Less than	2
Bromoform	Less than	2
Bromodichloromethane	Less than	2
Fluorotrichloromethane	Less than	2
Dichlorodifluoromethane	Less than	2
Chlorodibromomethane	Less than	2
Tetrachloroethene	Less than	2
Toluene	Less than	2
Trichloroethene	Less than	2
Vinyl chloride	Less than	2
Total xylene isomers	Less than	5
Methyl ethyl ketone	Less than	20
Methyl isobutyl ketone	Less than	10
Acetone	Less than	40

Results were identical for all four volatiles sampling programs:

February 1, 1984
April 12, 1984
July 16, 1984
July 24, 1984

TABLE 5

Organic Halogens, EPA Method 608
Northeast Solite Corporation
Polishing Pond, 1984

Compounds	MDL	February	April	July 16	July 24
Aldrin	0.004	ND	ND	--	--
Alpha BHC	0.002	ND	ND	--	--
Beta BHC	0.006	ND	ND	--	--
Delta BHC	0.006	ND	ND	--	--
Lindane	0.002	ND	ND	--	--
Chlordane	0.06	ND	ND	--	--
p,p'-DDE	0.008	ND	ND	--	--
p,p'-DDD	0.02	ND	ND	--	--
p,p'-DDT	0.02	ND	ND	--	--
Dieldrin	0.01	ND	ND	--	--
Endosulfan 1	0.01	ND	ND	--	--
Endosulfan 2	0.01	ND	ND	--	--
Endosulfan Sulfate	0.02	ND	ND	--	--
Endrin	0.02	ND	ND	--	--
Endrin Aldehyde	0.04	ND	ND	--	--
Heptachlor	0.002	ND	ND	--	--
Heptachlor Epoxide	0.004	ND	ND	--	--
Methoxychlor	0.04	ND	ND	--	--
Toxaphene	0.50	ND	ND	--	--
Aroclor 1016	0.10	ND	ND	ND (0.7)	ND (0.3)
Aroclor 1221	0.24	ND	ND	ND (0.8)	ND (0.5)
Aroclor 1232	0.14	ND	ND	ND (0.3)	ND (0.4)
Aroclor 1242	0.12	ND	ND	ND (0.2)	ND (0.3)
Aroclor 1248	0.12	ND	ND	ND (0.2)	ND (0.3)
Aroclor 1254	0.16	ND	ND	ND (0.3)	ND (0.1)
Aroclor 1260	0.16	ND	ND	ND (0.3)	ND (0.1)

1) MDL = Method Detection Limit, mg/L (ppm).
2) ( ) = numbers in parentheses indicate MDLs for July sampling events.
3) The July analytical schemes included only Aroclor determinations.

TABLE 6

Hydrocarbon Scan
Gas Chromatography/Mass Spectroscopy

Northeast Solite Corporation
Polishing Pond

Sampling Date	Total Hydrocarbons*
February 1, 1984	<30
April 12, 1984	<30
July 16, 1984	40
July 24, 1984	13

* As Isooctane, ug/L (ppb).

5.3 Sludge Quality

5.3.1 Extraction Procedure Toxicity

The E. P. Tox. data presented in Table 7 for settling pond sludge quality parallels that seen in the polishing pond water. No parameters exceeded the E. P. Tox. MCL.

5.3.2 Organic Analysis

Settling pond sludge generated during Northeast Solite's utilization of liquid burnable materials was analyzed for the organic parameters of Table 8. A combination of three gas chromatographic techniques was employed to analyze the entire list: EPA Method 624 (Purgeable Organics, GC/MS); direct aqueous injection (ketones plus alcohols) and a combination acid-base/neutral extractables by GC/MS (modified EPA Method 625).

All parameters were at the "not detected" level. Traces of phthalates shown for all sites were attributable to laboratory background problems. Results and confirmation of the laboratory problem are included in Appendix A.

5.4 Soil Analysis

Upgradient overburden soil cores were sampled from different depths and analyzed for some of the constituents seen in the polishing pond. Results are presented in Table 9.

Lead levels parallel the unfiltered groundwater (soil) lead concentrations. In all three cases, arsenic levels are slightly higher than soils associated with groundwater wells. This confirms

TABLE 7

Northeast Solite Corporation
Extraction Procedure Toxicity
Settling Pond Sludge Dredgings

	February 17, 1984			July 16, 1984			
Parameter*	North	Middle	South	North	Middle	South	MCL**
Arsenic	<0.050	<0.050	<0.050	0.026	0.024	0.022	5
Barium	8.1	4.3	2.4	<0.5	<0.5	<0.5	100
Cadmium	0.60	0.65	0.30	0.290	0.080	0.080	1
Chromium^{++}	0.16	0.13	0.12	0.110	0.090	0.120	5
Lead	2.55	2.15	1.7	0.110	0.060	0.060	5
Mercury	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.2
Selenium	0.014	0.015	0.006	0.026	0.025	0.015	1
Silver	<0.005	<0.005	<0.005	<0.010	<0.010	<0.010	5
% Water, 80°C	68.5	67.5	75.6	11.0	8.6	10.8	

* All values in Mg/L

** Maximum Contaminant Level

$^{++}$ Total Chromium

TABLE 8

Northeast Solite Corporation
Parameter List

Organic Analysis of Sludge Generated While on Liquid Burnable Materials

Acetone
Benzene
Carbon disulfide
Carbon tetrachloride
Chlorinated fluorocarbons
Chlorobenzene
Cresols
Cresylic acid
Cyclohexanone
Ethyl acetate
Ethyl benzene
Ethyl ether
Isobutanol
Methanol
Methyl ethyl ketone
Methyl isobutyl ketone
Methylene chloride
n-butyl alcohol
Nitrobenzene
ortho-dichlorobenzene
Pyridine
Tetrachloroethylene
Toluene
Trichloroethylene
1,1,1-trichloroethane
Trichlorofluoromethane
1,1,2-trichloro-1,2,2-trifluoroethane
Xylenes

All reported concentrations were at the "not detected" level; analytical results are included in Appendix A.

Table 9

Northeast Solite Corporation
March 8, 1984
Matrix Analyses

Parameter†	Coal	Shale	Soil #1	Soil #2	Soil #3
Phenols*	0.030	<0.025	<0.025	<0.025	<0.025
Chloride*	10	5	<5	<5	<5
Sulfate*	350	17.5	<12.5	<12.5	<12.5
Lead**	3.0(104)	2.4(94)	1.75(100)	2.5(96)	2.5(100)
Selenium**	0.16(98)	0.03(100)	0.02(100)	<0.01(105)	0.02(110)
Arsenic**	2.25(96)	2.1(94)	3.38(96)	5.25(98)	6.0(104)
% Moisture at 75°C	1.8	0.03	6.03	5.67	5.37

* Analysis performed on a wet weight basis.

** Analysis performed on samples dried at 75°C.

† Concentrations are expressed as mg/100 gm matrix.

Note: 1) Lead, selenium and arsenic analyses were performed by the method of standard additions.

2) Numbers in parentheses indicate the quality control percent recovery data.

the overall lack of metals contamination in the monitoring wells, given that there is no significant difference in (total) lead concentrations between pond downgradient areas and other (upgradient) areas not affected by the industrial process.

5.5 Coal and Shale Analysis

Table 9 lists the results of the analyses of coal and shale, both taken just prior to kiln feeding on the same day. Lead concentrations in both matrices were similar to the levels seen in the upgradient soils analyses although arsenic was lower by almost half.

6.0 RECOMMENDATIONS FOR ADDITIONAL ACTION

In view of the strong correlation (as shown in Graph 7) between polishing pond chlorides and parallel levels observed in downgradient monitoring wells, and in addition to the facility's return to liquid burnable materials, a new sampling and analytical protocol is recommended. Groundwater, surface water, and sludge monitoring will be coordinated to establish an overall description of the lagoons system's shale fines handling capabilities.

6.1 Groundwater Monitoring

Groundwater monitoring will consist of a network composed of monitoring wells USP-1A, DSP-3, DSP-2B, DSP-2C, DSP-2D, and DSP-4. Wells DSP-2B and -2C are the most contaminated sites with respect to chloride and sulfate and serve as indicators of activity at known depths of contamination. Well DSP-2D will serve as an indicator of any new downward vertical component of plume migration. In order to amass a library of hydrologic information, the protocol will be monthly.

Sampling and laboratory analysis will be similar to the most recent cluster well investigation, but with fewer wells being tested and a few additional parameters to reflect any possible contribution by LBMs. Wells will be exercised by removing 3-5 well volumes before sampling, where possible. Conductivities will be recorded at one foot intervals. Table 10 lists the proposed monitoring well protocol. Wells DSP-2B and DSP-3 will be used as total parameter indicators. Wells DSP-2C and -2D will be used to delineate the vertical extent of groundwater chloride contamination.

It is our opinion that high manganese levels observed in well DSP-4 do not arise from the ponds, but probably from the upgradient coal pile. Lack of chlorides in this well is the biggest supporting evidence. For that reason, this well will undergo an abbreviated protocol.

It is recommended that this monthly groundwater protocol be performed for six months, beginning in January 1985. At the end of this period the data will be reviewed to determine whether monitoring should proceed to a quarterly yearly basis. At the end of one year, the data will be reviewed again to determine what direction monitoring will take and to prepare an official NES response to NYSDEC. This assumes that no major deleterious chemical changes occur in the ponds system to affect groundwater quality to the degree that sudden protocol changes or remedial actions are required.

6.2 Surface Water Monitoring

In order to track contamination parameters from as near their source as possible, three surface water sites are recommended for monitoring: scrubber effluent, settling pond, and polishing pond. Coordination of analytical results over time will allow us to determine parameter attenuation or concentration. Other benefits

TABLE 10

Northeast Solite Corporation
Proposed Monitoring Well Protocol

Parameter	USP-1A	DSP-2B	DSP-3	DSP-2C	DSP-2D	DSP-4
Conductivity*	*	*	*	*	*	*
Chloride	*	*	*	*	*	*
Sulfate	*	*	*	*	*	*
pH	*	*	*	*	*	*
Lead	*	*	*	*		
Lead, F**	*	*	*	*		
Selenium, F	*	*	*			
Arsenic, F	*	*	*			
Antimony, F	*	*	*			
Cadmium, F	*	*	*			
Chromium, F	*	*	*			
Iron, F	*	*	*			*
Manganese, F	*	*	*			*
Barium, F	*	*	*			

* To be measured in the field at one foot depth intervals.

** Field filtered through 0.45 micrometer cellulose membranes followed by nitric acid acidification.

that may derive from this monitoring are the possibility of predicting the solids deposition in the settling pond, better knowledge of the ponds' pH levels, and possibly a parameter mass balance study to better track the path of contaminant flow.

6.2.1 Scrubber Effluent

It is recommended that scrubber effluent, prior to pH adjustment in the trough, be analyzed for the following parameters on a twice monthly basis.

pH
Total Solids
Dissolved Solids
Lead, total
Chloride
Sulfate

6.2.2 Settling Ponds

In order to characterize the chemical constituency of the settling pond water, and to compare both the efficiency of settling and the chemical gradient established between scrubber and polishing pond, the following analytic parameters are recommended from samples collected at the settling pond(s) influent (i.e., pH adjusted scrubber effluent) on a monthly basis.

pH
Conductivity
Chloride
Sulfate
Lead
Arsenic
Selenium
Cadmium
Iron
Manganese
Antimony
Barium

6.2.3 Polishing Pond

6.2.3.1 Inorganic Analysis

Monitoring of the polishing pond will remain similar to previous protocols with only minor changes. Samples will be collected from the pond inlet (settling pond discharge) from the most active discharge pipe at the time of sampling. If more than one discharge pipe maintains heavy active flow then a composite will be collected. Recommended monthly monitoring includes:

pH
Chloride
Sulfate
Lead
Cadmium
Conductivity
Arsenic
Selenium
Iron
Manganese
Antimony
Barium

6.2.3.2 Organic Analysis

In view of Northeast Solite's imminent return to liquid burnable materials, organic monitoring of the polishing pond has been requested by NYSDEC. On a monthly basis, samples of polishing pond water will be analyzed for Aroclors and a total hydrocarbon scan by gas chromatography/mass spectroscopy.

Previous organic analysis of pond water for these parameters has consistently shown their presence to be non-existent. In the event that certain trigger levels are exceeded, an immediate resampling of the pond will be performed. If excess levels are confirmed then all downgradient groundwater monitoring wells will be sampled and analyzed for these organic parameters. These trigger levels are:

Aroclors	MDL*
Total Hydrocarbons	100 ppb

6.3 Sludge Monitoring

As a means of assessing any potential heavy metal build-up in settling pond sediment, NYSDEC has requested monthly sampling and analysis of in-situ settling pond sludge. Sludge is to be collected only from the surface of the bottom of the pond as a composite of 4-6 samples to be analyzed by the Extraction Procedure Toxicity test for the following metals:

Lead
Arsenic
Cadmium
Chromium
Selenium
Barium

---

* Since Aroclors as a class do not have a single method detection limit (EPA Method 608), each Aroclor will be treated individually.

APPENDIX A

Previous Sampling and Analytical Results

DUNN
GEOSCIENCE CORP.

5 NORTHWAY LANE NORTH •
LATHAM, NEW YORK 12110
(518) 783-8102

May 22, 1984

Mr. John H. Bragg
Northeast Solite Corporation
P.O. Box 437
Mt. Marion, NY 12456

RE: Lagoon Area Ground Water Monitoring

Dear John:

The purpose of this letter is to present to you the results of the April 12, 1984 round of ground water sampling and analyses at the lagoon area of Northeast Solite Corporation. The protocol included four ground water monitoring wells, USP-1, DSP-2, -3 and -4, and surface water from the north end of the polishing pond.

The usual NYSDEC consent parameters were sought; sampling protocol and analytical techniques remained the same as in previous rounds of testing.

Table 1 lists the results of the purgeable organics analysis (USEPA Method 624: GC/MS). Including the additional standards (xylenes and ketones), no compounds were detected at or above the method detection limit (MDL).

Table 2 lists the results of the priority pollutant pesticides and Aroclors. Of the 26 compounds, none were detected.

Results of the total hydrocarbon scan are presented in Table 3. All sites showed nothing exceptional. The MDL of 80 ppb for USP-1 arises from not enough sample available for testing. All other samples were below the MDL of 30 ppb.

Table 4 lists the results of analyses for metals, wet chemistry and selected (colorimetric) organics. In general, high level results for well USP-1 are attributable to the coal pile and are not weighted heavily into the general discussion of the ground water quality monitoring system. Table 4 lists the appropriate MDL's under the Field Blank column.

Chloride levels in DSP-3 and DSP-2 (1570 and 4360 mg/L, respectively) most likely arise from the high levels seen in the polishing pond (14,800 mg/L). However, the elevated sulfates seen in DSP-3 and DSP-2 (393 and 732 mg/L) could possibly arise from a point further up gradient than the polishing pond (1810 mg/L), such as in the vicinity of USP-1 (3630 mg/L). This could also apply to the slightly elevated manganese levels, although they are of no concern.

It may be merely coincidental that USP-1 and the polishing pond share the same elevated arsenic and iron, even though these two metals are not present in the monitoring wells.

Three other metals have been detected at elevated levels: cadmium and lead at well DSP-2 (40 and 186 ug/L, respectively) and selenium at wells DSP-3 and DSP-2 (25 and 54 ug/L). While the levels of cadmium and lead in the polishing pond could possibly account for the levels seen in well DSP-2, a previous study of the cluster wells indicated that lead levels were probably not a problem arising from the pond.

In a preceeding report entitled Lagoon Area - Monitoring Well Installation and Ground Water Quality Analysis, dated March 13, 1984, the results of a two-day (January 12-13, 1984) sampling protocol at the cluster wells were presented. Combined with the results of our March 8, 1984 sampling and testing of "virgin" soils that were reported in my letter of April 26, there is strong evidence to support a moderate level of soil lead indigenous to the area. The results also indicate that the wells may tend to concentrate chemical constituents. Analysis of the water from exercised and recharged wells showed that filtered samples, as well as total matrix samples (in the determination of lead levels), were cleaner than water in the wells that had not been exercised.

Two major points arise from this data preventing any conclusions about the polishing pond as a source of ground water problems. The first is that laboratory values for cadmium, selenium and lead were not confirmed by the method of standard additions. The second is the need to implement a study to better define the soil/ground water metals content of the cluster well area (at DSP-2) in terms of soil/water partitioning. Both of these needs are met with the new protocol proposed to you in our March 13 report and later amended in a letter from me dated April 26, 1984.

Both of these needs are required to properly interpret the elevated selenium levels. Sufficient soil/water partitioning data for selenium at this site are unavailable. The new protocol will address the protocol for selenium analysis.

Elevated phenols were seen in all the wells, especially DSP-2. The source is unknown since the level of phenols in the polishing pond is and has not been high enough during the last few rounds of sampling to produce such levels in the wells. The proposed lagoon area sampling and testing protocol has provisions for better delineating the source of phenols.

During testing of the DSP-2 cluster wells it was found that a high level of conductivity due to chloride exists in the ground water north of the polishing pond at 10-20 feet below grade. Preliminary testing has shown that the chlorides appear to be the only problem, and that the connection between the polishing pond and the ground water is not a general one that allows indiscriminate contaminant transport. The new protocol, if adopted, will better define the chemistry of the specific area in question and allow a better understanding of the soil/water partitioning.

Very truly yours,

Sander I. Bonvell

Sander I. Bonvell
Senior Chemist

SIB/cvl

LABORATORY RESULTS
VOLATILES**EPA METHOD 624

TABLE 1.

Volatile Compounds	DSP-2	DSP-3	DSP-4	Polishing Pond	USP-1	Field Blank
	Concentration ug/l					
Acrolein	<10	<10	<10	<10	<10	<10
Acrylonitrile	<10	<10	<10	<10	<10	<10
Benzene	<2	<2	<2	<2	<2	<2
Carbon tetrachloride	<2	<2	<2	<2	<2	<2
Chlorobenzene	<2	<2	<2	<2	<2	<2
1,2-Dichloroethane	<2	<2	<2	<2	<2	<2
1,1,1-Trichloroethane	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	<2	<2	<2	<2	<2	<2
1,1,2-Trichloroethane	<2	<2	<2	<2	<2	<2
1,1,2,2-Tetrachloroethane	<2	<2	<2	<2	<2	<2
Chloroethane	<2	<2	<2	<2	<2	<2
2-Chloroethylvinyl ether	<10	<10	<10	<10	<10	<10
Chloroform	<2	<2	<2	<2	<2	<2
1,1-Dichloroethene	<2	<2	<2	<2	<2	<2
Trans-1,2-Dichloroethene	<2	<2	<2	<2	<2	<2
1,2-Dichloropropane	<2	<2	<2	<2	<2	<2
1,3-Dichloropropene	<2	<2	<2	<2	<2	<2
Ethylbenzene	<2	<2	<2	<2	<2	<2
Methylene chloride	<10	<10	<10	<10	<10	<10
Chloromethane	<2	<2	<2	<2	<2	<2
Bromomethane	<2	<2	<2	<2	<2	<2
Bromoform	<2	<2	<2	<2	<2	<2
Bromodichloromethane	<2	<2	<2	<2	<2	<2
Trichlorofluoromethane	<2	<2	<2	<2	<2	<2
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2
Chlorodibromomethane	<2	<2	<2	<2	<2	<2
Tetrachloroethene	<2	<2	<2	<2	<2	<2
Toluene	<2	<2	<2	<2	<2	<2
Trichloroethene	<2	<2	<2	<2	<2	<2
Vinyl chloride	<2	<2	<2	<2	<2	<2
Xylene isomers	<5	<5	<5	<5	<5	<5
Acetone	<40	<40	<40	<40	<40	<40
Methyl ethyl ketone	<20	<20	<20	<20	<20	<20
Methyl isobutyl ketone	<10	<10	<10	<10	<10	<10

Spike Recoveries (%)

D6-benzene	90.8	90.8	103.2	90.5	101.5	93.0
Fluorobenzene	93.2	93.8	99.0	93.0	97.8	96.0
Pentafluorobenzene	90.5	86.5	104.8	97.8	102.2	92.5

TABLE 2. RESULTS OF PRIORITY POLLUTANT PESTICIDES/PCB ANALYSIS ON AQUEOUS SAMPLES COLLECTED BY DUNN GEOSCIENCE 12 APRIL 1984

	Concentration (ug/l)						
Compounds	DSP-2	DSP-3	DSP-4	Polishing Pond	USP-1	Field Blank	Detection Limits
Aldrin	ND	ND	ND	ND	ND	ND	0.004
Alpha BHC	ND	ND	ND	ND	ND	ND	0.002
Beta BHC	ND	ND	ND	ND	ND	ND	0.006
Delta BHC	ND	ND	ND	ND	ND	ND	0.006
Lindane	ND	ND	ND	ND	ND	ND	0.002
Chlordane	ND	ND	ND	ND	ND	ND	0.06
p,p-DDE	ND	ND	ND	ND	ND	ND	0.008
p,p-DDD	ND	ND	ND	ND	ND	ND	0.02
p,p-DDT	ND	ND	ND	ND	ND	ND	0.02
Dieldrin	ND	ND	ND	ND	ND	ND	0.01
Endosulfan 1	ND	ND	ND	ND	ND	ND	0.01
Endosulfan 2	ND	ND	ND	ND	ND	ND	0.01
Endosulfan Sulfate	ND	ND	ND	ND	ND	ND	0.02
Endrin	ND	ND	ND	ND	ND	ND	0.02
Endrin Aldehyde	ND	ND	ND	ND	ND	ND	0.04
Heptachlor	ND	ND	ND	ND	ND	ND	0.002
Heptachlor Epoxide.	ND	ND	ND	ND	ND	ND	0.004
Methoxychlor	ND	ND	ND	ND	ND	ND	0.04
Toxaphene	ND	ND	ND	ND	ND	ND	0.50
Aroclor 1016	ND	ND	ND	ND	ND	ND	0.10
Aroclor 1221	ND	ND	ND	ND	ND	ND	0.24
Aroclor 1232	ND	ND	ND	ND	ND	ND	0.14
Aroclor 1242	ND	ND	ND	ND	ND	ND	0.12
Aroclor 1248	ND	ND	ND	ND	ND	ND	0.12
Aroclor 1254	ND	ND	ND	ND	ND	ND	0.16
Aroclor 1260	ND	ND	ND	ND	ND	ND	0.16

ND - Not Detected

TABLE 3

TOTAL HYDROCARBON SCAN
GC/MS

Sample	Total Hydrocarbon ug/L*	Total Hydrocarbon ug/L**
Field Blank	<15	<30
DSP-2	<15	<30
DSP-3	<15	<30
DSP-4	<15	<30
Polishing Pond	<15	<30
USP-1	<40	<80

* Based on 2-fluorobiphenyl
** Based on isooctane

TABLE 4. RESULTS OF CHEMICAL ANALYSIS OF GROUND-WATER SAMPLES COLLECTED BY DUNN GEOSCIENCE - 12 APRIL 1984

arameter	Unit	DSP-3	DSP-2	Polishing Pond	DSP-4	USP-1	Field Blank
hloride	mg/l	1570	4360	14800	60	14	<0.2
otal Cyanide	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
luoride	mg/l	0.2	0.2	11	0.3	0.1	<0.1
itrate-Nitrogen	mg/l	0.15	1.35	24.2	1.85	0.95	<0.01
H	Unit	7.2	7.1	3.1	7.5	3.3	3.9
ulfate	mg/l	393	732	1810	199	3630	<2
ulfide	mg/l	<1	<1	<1	<1	<1	<1
luminum	mg/l	0.094	0.090	101	0.082	215	--
rsenic	mg/l	<0.002	<0.002	0.064	0.002	0.093	<0.002
arium	mg/l	0.186	0.233	0.828	0.145	0.038	<0.005
admium	mg/l	0.0062	0.0401	0.216	0.0011	0.0218	<0.0003
exavalent Chromium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
opper	mg/l	0.024	0.172	0.655	0.033	0.150	--
ron	mg/l	0.06	0.12	10.3	0.12	254	<0.02
ead	mg/l	0.026	0.186	0.46	0.006	0.050	--
anganese	mg/l	0.05	0.46	16.9	1.04	114	<0.03
ercury	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
ickel	mg/l	0.10	0.16	1.79	<0.05	1.93	<0.05
elenium	mg/l	0.025	0.054	0.019	0.004	0.054	<0.003
ilver	mg/l	0.0012	0.012	0.077	0.0004	0.0091	<0.0002
inc	mg/l	0.02	0.08	2.79	1.16	20.8	<0.005
il and Grease	mg/l	<1	<1	<1	<1	<1	<1
henols	mg/l	0.08	0.14	0.03	0.02	0.07	<0.005
urfactants	mg/l	<0.05	<0.15	<0.15	<0.15	<0.05	<0.05
ross Alpha	pCi/l	<7	<8	220±70	<3	<10	--
ross Beta	pCi/l	<3	<4	3100±100	6.1±1.3	33±4	--

EOSCIENCE CORP.

NORTHWAY LANE NORTH •
THAM, NEW YORK 12110
18)783-8102

April 26, 1984

Mr. John Bragg
Northeast Solite Corporation
P.O. Box 437
Mt. Marion, NY 12456

Dear John:

Enclosed is a sampling and analytical protocol we recommend for the Northeast Solite lagoon area. It is a modified version of the program presented in our March 13, 1984 report entitled, "Lagoon Area - Monitoring Well Installation and Ground Water Quality Analysis".

We feel that a change in consent order monitoring to adopt this protocol would be cost effective and would better study the chemistry of this area.

Since a consent order round of sampling has just been completed (April 12, 1984), we feel the amended protocol should be adopted no later than June 1, 1984.

Very truly yours,

Sander I. Bonvell

Sander I. Bonvell
Senior Chemist

SIB/cvl
Enclosure

Recommended Sampling and Analytical Protocol
Northeast Solite Lagoon Area

	Upgradient Well	Cluster at DSP-2 Including DSP-2A through DSP-2F	DSP-3	DSP-4	Polishing Pond
Conductivity	MQ	MQ	Q	Q	Q
Chloride	MQ	MQ	Q	Q	Q
Sulfate	MQ	MQ	Q	Q	Q
Phenols	MQ	MQ	Q	Q	Q
Lead	MQ*	MQ*	Q*	Q	Q
Selenium	MQ*	MQ*	Q*	Q	Q
Arsenic	MQ*	MQ*	Q*	Q	Q
pH	MQ	MQ*	Q	Q	Q
Antimony	MQ*	MQ*	Q*	Q	Q

Q	Quarterly Sampling
MQ	Monthly Sampling for 3 Months, Followed by Quarterly Sampling Thereafter
MQ*	Same as MQ Above, But Includes Analysis of Field Filtered, As Well As Total Matrix, Sample

DUNN
GEOSCIENCE CORP.

5 NORTHWAY LANE NORTH •
LATHAM, NEW YORK 12110
(518) 783-8102

August 7, 1984

Mr. John Bragg
Northeast Solite Corporation
P.O. Box 437
Mt. Marion, NY 12456

Dear John:

The purpose of this letter is to report to you the results of the June 19, 1984 round of sampling and analysis of the lagoon area at Northeast Solite Corp. Laboratory data is summarized in the attached table.

With regard to the metals, filtered samples were at minimum detectable levels indicating no ground water problem; only antimony showed 0.9 mg/L levels in both the polishing pond and well DSP-2B (filtered and unfiltered). However, ground water standards (NYSDEC Part 703) do not cover antimony and therefore an appropriate level for a maximum contaminant level (MCL) has not been chosen.

In support of our prediction that the polishing pond is probably not contributing metals to the ground water, note that the upgradient (USP-1A) lead level, unfiltered, is higher than any downgradient well. Lead, when present, appears to be in the soil naturally, as evidenced by this and previous analyses.

Phenol levels were higher than we expected in wells DSP-2B, -2C, -2E and -2F. The source of these, if not natural, is elusive since the pond is consistently low in phenol, as was the coal when sampled earlier this year. No upgradient source can supply such levels unless either: 1) the "phenols" are break-down products of parent compounds not being sought or 2) these values do not represent phenols but rather non-specific organic constituents of the soil which react with the colorimetric indicator in the phenol test (4-aminoantipyrene). This is the first time that the cluster wells have been analyzed for phenol. We will monitor further before drawing any conclusions.

There are still elevated conductivities brought about by high levels of chloride, and possibly sulfate, especially in wells DSP-2B, 2C and DSP-3. Although these levels do not present major environmental concerns, they should be closely monitored.

Northeast Solite Corporation
Lagoon Program*
June 19, 1984

Parameter	MDL**	DSP-2A	DSP-2B	DSP-2C	DSP-2D	DSP-2E	DSP-2F	DSP-3	DSP-4	USP-1A	P. Pond	GWS,NYSDEC 703+
Conductivity	1	1340	11800	2150	1020	770	2400	5400	980	460	20,500	NA
Chloride	2	346	1020	1020	447	180	697	2830	101	16	12,500	250
Sulfate	10	145	1100	230	150	40	380	480[F]	138[F]	70[F]	3100[F]	250
Phenols	0.005	0.021	0.18	0.12	0.056	0.22	0.21	0.053	0.049	0.054	BMDL	0.001
Lead, Total	0.010	0.025	0.054	0.065	0.083	0.075	0.033	BMDL	BMDL	0.94	3.55	-
Lead, Filtered[F]	0.010	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	-	BMDL	-	0.025
Selenium, Total	0.002	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	0.003	0.049	-
Selenium, Filtered[F]	0.002	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	-	BMDL	-	0.020
Arsenic, Total	0.020	BMDL	BMDL	BMDL	BMDL	0.02	BMDL	BMDL	BMDL	0.028	0.146	-
Arsenic, Filtered[F]	0.020	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	-	IS	-	0.025
Antimony, Total	0.5	BMDL	0.9	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	BMDL	0.9	-
Antimony, Filtered[F]	0.5	BMDL	0.9	BMDL	BMDL	BMDL	BMDL	BMDL	-	BMDL	-	-
pH, Total	NA	7.7	6.9	7.2	7.6	7.5	7.3	6.9	7.2	6.7	3.1	-
pH, Filtered[F]	NA	8.1	7.2	7.5	7.8	7.7	8.2	-	-	-	-	-

*Samples Collected by Dunn Geoscience Corporation
**All units as mg/L, except pH and conductivity(umhos)
F Filtered thru 0.45 micron cellulosic membrane
BMDL = Below method detection limit
+ Ground water standards, NYSDEC Part 703 of Title 6, CCRR
IS= Insufficient Sample

Because the pond contains such high levels of chloride and sulfate (and maintains a high conductivity as a result of these anions), it is natural to question whether contamination in these wells results from the polishing pond due to past practices or current problems.

If the land downgradient of the pond was saturated with material from past surface discharges, it could be years before the salts are flushed and diluted. Data obtained from various wells around the polishing pond and used to calculate ground water velocities yield a time of approximately 5 to 17 years to traverse the 100 feet distance from the pond to the cluster wells.

However, if the polishing pond possesses defects in its structural integrity and is the source of the ground water chlorides, then dye tracer studies could possibly yield an answer in a few months.

All cluster well ground waters exhibited a rise in pH after filtering, suggesting an acidic component in the soil matrix non-filterable fraction. The lowest pH was seen in DSP-2B, also the highest in conductivity.

This sampling period was the first in a series of three investigatory monthly tests. A second round was performed on July 19, 1983 (results pending) and the third, and final, is scheduled for mid to late August. Following this, the data for all three rounds will be evaluated and a summary report will be submitted.

Please do not hesitate to call me if you have any questions or comments.

Very truly yours,

Sander

Sander Bonvell
Senior Chemist

SB: ibj
Attachment

cc: E. Martin
T. West

DUNN GEOSCIENCE CORP.

5 NORTHWAY LANE NORTH •
LATHAM, NEW YORK 12110
(518) 783-8102

August 24, 1984

Mr. John Bragg
Northeast Solite Corporation
P.O. Box 437
Mt. Marion, NY 12456

Dear John:

The purpose of this letter is to summarize the findings of the July 19, 1984 round of sampling and analysis at the Northeast Solite lagoon area. This was the second round in a three-round investigatory protocol to determine ground water quality in this area.

The analytical results are presented in the attached table. They are very similar to the first round of sampling performed on June 19, 1984.

High levels of chlorides, sulfates, and conductivity are still predominant in monitoring wells DSP-3, DSP-2B, and DSP-2C. This has been a consistent pattern. A more detailed discussion of this matter was covered in my report of August 7, 1984.

You will also notice that phenols were below the method detection limit (BMDL) in all samples, including the polishing pond. This supports our hypothesis that the phenols levels witnessed in the past were natural in origin and not connected with the production facilities at Northeast Solite.

With regard to the ground water metals analysis, all filtered samples for all metals were at the BMDL level, or so near to it as to be insignificant. Although unfiltered samples in wells DSP-2A, -2B, -4, and USP-1A were theoretically above ground water standards, there is no correlation between these values and the anion/conductivity contamination. Again, it is our hypothesis that although the source of lead cannot be defined unambiguously, it can be stated that its presence does not appear to threaten ground water quality.

A third round of sampling and analysis was performed on August 21, 1984. Laboratory results are pending. Upon review of this final set of preliminary data, a summary report will be submitted with our assessment of the ground water quality and recommendations for further monitoring.

In view of Northeast Solite's iminent return to LBM use in the kilns, this final report will also include a protocol to include organics monitoring at the lagoon site, unless this information is needed sooner.

Please don't hesitate to call if you have any questions or comments regarding the above matters.

Very truly yours,

Sander

Sander I. Bonvell
Senior Chemist

SIB/cvl
Enclosure
cc: E. Martin
T. West

Northeast Solite Corporation
Ground Water Monitoring
Lagoon Area Protocol
July 19, 1984

Parameter	DSP 2A	DSP 2B	DSP 2C	DSP 2D	DSP 2E	DSP 2F
Conductivity umhos @ 25° C	1,510	17,700	9,180	1,780	820	1,730
Chloride	560	13,250	5,300	645	84	440
Sulfate*	180	1,050	825	185	42	260
Phenols	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lead	0.370	0.070	0.015	0.017	0.028	0.034
Lead Filt.	<0.010	<0.010	<0.010	<0.010	<0.010	0.012
Selenium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium Filt.	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	0.067	<0.020	<0.020	<0.020	<0.020	<0.020
Arsenic Filt.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
pH, units	7.73	6.80	6.93	7.40	7.45	7.43
pH, units Filt.	8.25	7.07	7.31	7.81	7.80	7.88
Antimony	<1	<1	<1	<1	<1	<1
Antimony Filt.	<1	<1	<1	<1	<1	<1

Parameter	Upgradient	DSP-3	DSP-4	Polishing Pond
Conductivity umhos @ 25° C	625	5,500	1,060	32,400
Chloride	5	2,800	76	18,000
Sulfate	85	460	180	2,300
Phenols	<0.005	0.005	<0.005	<0.005
Lead	0.190	0.016	0.075	2.00
Lead Filt.	0.014	<0.010	-	-
Selenium	<0.002	<0.002	<0.002	0.182
Selenium Filt.	<0.002	<0.002	-	-
Arsenic	0.029	<0.020	<0.020	2.30
Arsenic Filt.	<0.020	<0.020	-	-
pH, units	7.29	6.89	7.24	2.2
Antimony	<1	<1	<1	<1
Antimony Filt.	<1	<1	-	-

All values expressed in Mg/L except where noted.

*All sulfate samples filtered thru 0.45 micrometer membrane.

EOSCIENCE CORP.

5 NORTHWAY LANE NORTH •
ATHAM, NEW YORK 12110
18)783-8102

March 19, 1984

Mr. John Bragg
Northeast Solite Corporation
P.O. Box 437
Mt. Marion, NY 12456

Dear John:

On February 17, 1984, samples were obtained from the sludge pile east of the east settling lagoon for the purpose of Extraction Procedure Toxicity testing. Sludge was sampled along the west face of the pile, approximately half-way up the pile, at intervals of approximately seven feet, horizontally. The pile was divided into three sections (North, Mid, South) of approximately fifty feet each. The west side of this pile represents the most recent dredging and collection of sludge from the lagoon.

At each sampling site, approximately 12-18 inches of surface clay were removed to expose "unweathered" sample. Samples were obtained with a hand spade and consisted of extremely hard-packed clay. Seven samples, each approximately 1/4-1/2 cubic feet, from each section were composited for analysis.

The results of the inorganic analyses from Bender Hygienic Laboratory (Albany, NY) are attached. No parameter from any site exceeds E.P. Toxicity maximum contaminant levels.

Sincerely,

Sander Bonvell

Sander I. Bonvell
Senior Chemist

SIB/cvl
Attachment

Extraction Procedure Toxicity Analysis

Sludge from East Settling Lagoon
Northeast Solite
Mt. Marion, New York
February 17, 1984

Parameter[1,2]	North	Mid	South	MCL[3]
Arsenic	<0.050	<0.050	<0.050	5
Barium	8.1	4.3	2.4	100
Cadmium	0.60	0.65	0.30	1
Chromium	0.16	0.13	0.12	5
Lead	2.55	2.15	1.7	5
Mercury	0.002	<0.001	<0.001	0.2
Selenium	0.014	0.015	0.006	1
Silver	<0.005	<0.005	<0.005	5
% Solids @ 80°C	68.47	67.48	75.64	

1. All values expressed in Mg/L.
2. All analyses performed by method of standard addition. Refer to BHL No. 10447.
3. Maximum Contaminant Level

100 gram (wet weight) samples were used for extraction procedure.

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GEOSCIENCE CORP.

5 NORTHWAY LANE NORTH •
LATHAM, NEW YORK 12110
(518)783-8102

August 23, 1984

Mr. Andrus LaBarge
Northeast Solite Corporation
P.O. Box 437
Mt. Marion, NY 12456

Dear Andy:

The purpose of this letter is to present the results of the sludge analyses and a description of the criteria for the assessment of hazardous materials.

On July 16, 1984, sludge dredgings from the settling ponds were collected by Dunn Geoscience Corporation personnel and submitted to the laboratory for analyses by the Extraction Procedure Toxicity test. In addition, three other criteria are used to determine whether or not a material is hazardous. It is our conclusion that the sludge is not a hazardous material.

The four characteristics of a hazardous material are any or all of the following: ignitability, corrosivity, reactivity, and toxicity. Their descriptions can be found in the Federal Register, Volume 45, No. 98 (May 19, 1980) in Part 261, Subpart C, sections 261.21, 261.22, 261.23, and 261.24, respectively. Photocopies of these Federal Register sections are enclosed. The sludge does not meet any of the ignitability, corrosivity, or reactivity criteria needed to define it as a hazardous substance.

The fourth and final criterion for listing a substance as a hazardous material is the Extraction Procedure Toxicity analysis. Due to the volume of the sludge, it was divided (in the field) into three sections and seven samples from each section were sampled and composited to yield a representative sample of that particular area. The three sections are north, middle, and south. The analytical results are presented in the attached table, along with the maximum allowable concentrations. None of the sludge samples exceeds, or in fact even approaches, these maximum contaminant levels (MCL) for E. P. Toxicity.

In summary, the sludge obtained from the Northeast Solite settling ponds does not meet any of the criteria needed to define it as a hazardous material.

Please do not hesitate to call if you have any questions or comments concerning this matter.

Very truly yours,

Sander

Sander I. Bonvell
Senior Chemist

SIB/cvl
Attachments
cc: J. Bragg
T. West
E. Martin

Northeast Solite Corporation
Sludge Chemical Analysis
Extraction Procedure Toxicity
July 16, 1984

Parameter*	MCL	North	Middle	South
Arsenic	5.0	0.026	0.024	0.022
Barium	100.0	<0.5	<0.5	<0.5
Cadmium	1.0	0.290	0.080	0.080
Chromium	5.0	0.110	0.090	0.120
Lead	5.0	0.110	0.060	0.06
Mercury	0.2	<0.0005	<0.0005	<0.0005
Selenium	1.0	0.026	0.025	0.015
Silver	5.0	<0.010	<0.010	<0.010
% Water		11.0	8.6	10.8
Initial Extraction pH	8.0	8.3	9.3	

* Quantitative results are expressed as mg/L.

to being used, re-used, recycled or reclaimed is subject to the following requirements with respect to such transportation or storage:

(1) Notification requirements under Section 3010 RCRA.

(2) Part 262 of this Chapter.

(3) Part 263 of this Chapter.

(4) Subparts A, B, C, D and E of Part 264 of this Chapter.

(5) Subparts A, B, C, D, E, G, H, I, J and L of Part 265 of this Chapter.

(6) Parts 122 and 124 of this Chapter, with respect to storage facilities.

Subpart B—Criteria for Identifying the Characteristics of Hazardous Waste and for Listing Hazardous Waste

§ 261.10 Criteria for identifying the characteristics of hazardous waste.

(a) The Administrator shall identify and define a characteristic of hazardous waste in Subpart C only upon determining that:

(1) A solid waste that exhibits the characteristic may:

(i) Cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or

(ii) Pose a substantial present or potential hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed; and

(2) The characteristic can be:

(i) Measured by an available standardized test method which is reasonably within the capability of generators of solid waste or private sector laboratories that are available to serve generators of solid waste; or

(ii) Reasonably detected by generators of solid waste through their knowledge of their waste.

§ 261.11 Criteria for listing hazardous waste.

(a) The Administrator shall list a solid waste as a hazardous waste only upon determining that the solid waste meets one of the following criteria:

(1) It exhibits any of the characteristics of hazardous waste identified in Subpart C.

(2) It has been found to be fatal to humans in low doses or, in the absence of data on human toxicity, it has been shown in studies to have an oral LD 50 toxicity (rat) of less than 50 milligrams per kilogram, an inhalation LC 50 toxicity (rat) of less than 2 milligrams per liter, or a dermal LD 50 toxicity (rabbit) of less than 200 milligrams per kilogram or is otherwise capable of causing or significantly contributing to an increase in serious irreversible, or incapacitating reversible, illness. (Waste listed in accordance with these criteria will be designated Acute Hazardous Waste.)

(3) It contains any of the toxic constituents listed in Appendix VIII unless, after considering any of the following factors, the Administrator concludes that the waste is not capable of posing a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of, or otherwise managed:

(i) The nature of the toxicity presented by the constituent.

(ii) The concentration of the constituent in the waste.

(iii) The potential of the constituent or any toxic degradation product of the constituent to migrate from the waste into the environment under the types of improper management considered in paragraph (a)(3)(vii) of this section.

(iv) The persistence of the constituent or any toxic degradation product of the constituent.

(v) The potential for the constituent or any toxic degradation product of the constituent to degrade into non-harmful constituents and the rate of degradation.

(vi) The degree to which the constituent or any degradation product of the constituent bioaccumulates in ecosystems.

(vii) The plausible types of improper management to which the waste could be subjected.

(viii) The quantities of the waste generated at individual generation sites or on a regional or national basis.

(ix) The nature and severity of the human health and environmental damage that has occurred as a result of the improper management of wastes containing the constituent.

(x) Action taken by other governmental agencies or regulatory programs based on the health or environmental hazard posed by the waste or waste constituent.

(xi) Such other factors as may be appropriate.

Substances will be listed on Appendix VIII only if they have been shown in scientific studies to have toxic, carcinogenic, mutagenic or teratogenic effects on humans or other life forms.

(Wastes listed in accordance with these criteria will be designated Toxic wastes.)

(b) The Administrator may list classes or types of solid waste as hazardous waste if he has reason to believe that individual wastes, within the class or type of waste, typically or frequently are hazardous under the definition of hazardous waste found in Section 1004(5) of the Act.

(c) The Administrator will use the criteria for listing specified in this section to establish the exclusion limits referred to in § 261.5(c).

Subpart C—Characteristics of Hazardous Waste

§ 261.20 General.

(a) A solid waste, as defined in § 261.2, which is not excluded from regulation as a hazardous waste under § 261.4(b), is a hazardous waste if it exhibits any of the characteristics identified in this Subpart.

[Comment: § 262.11 of this Chapter sets forth the generator's responsibility to determine whether his waste exhibits one or more of the characteristics identified in this Subpart]

(b) A hazardous waste which is identified by a characteristic in this subpart, but is not listed as a hazardous waste in Subpart D, is assigned the EPA Hazardous Waste Number set forth in the respective characteristic in this Subpart. This number must be used in complying with the notification requirements of Section 3010 of the Act and certain recordkeeping and reporting requirements under Parts 262 through 265 and Part 122 of this Chapter.

(c) For purposes of this Subpart, the Administrator will consider a sample obtained using any of the applicable sampling methods specified in Appendix I to be a representative sample within the meaning of Part 260 of this Chapter.

[Comment: Since the Appendix I sampling methods are not being formally adopted by the Administrator, a person who desires to employ an alternative sampling method is not required to demonstrate the equivalency of his method under the procedures set forth in §§ 260.20 and 260.21.]

§ 261.21 Characteristic of ignitability.

(a) A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume, and has a flash point less than 60°C (140°F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79, or a Setaflash Closed Cup Tester, using the test method specified in ASTM standard D-3278-78, or as determined by an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21.[1]

---

[1] ASTM Standards are available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that is creates a hazard.

(3) It is an ignitable compressed gas as defined in 49 CFR 173.300 and as determined by the test methods described in that regulation or equivalent test methods approved by the Administrator under §§ 260.20 and 260.21.

(4) It is an oxidizer as defined in 49 CFR 173.151.

(b) A solid waste that exhibits the characteristic of ignitability, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D001.

§ 261.22 Characteristic of corrosivity.

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using either the test method specified in the "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" [2] (also described in "Methods for Analysis of Water and Wastes" EPA 600/4-79-020, March 1979), or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21.

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM-01-69 [3] as standardized in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21.

(b) A solid waste that exhibits the characteristic of corrosivity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D002.

§ 261.23 Characteristic of reactivity.

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has *any* of the following properties:

(1) It is normally unstable and readily undergoes violent change without detonating.

(2) It reacts violently with water.

(3) It forms potentially explosive mixtures with water.

(4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D003.

§ 261.24 Characteristic of EP Toxicity.

(a) A solid waste exhibits the characteristic of EP toxicity if, using the test methods described in Appendix II or equivalent methods approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21, the extract from a representative sample of the waste contains any of the contaminants listed in Table I at a concentration equal to or greater than the respective value given in that Table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering, is considered to be the extract for the purposes of this section.

(b) A solid waste that exhibits the characteristic of EP toxicity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number specified in Table I which corresponds to the toxic contaminant causing it to be hazardous.

Table I.—Maximum Concentration of Contaminants for Characteristic of EP Toxicity—Continued

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D004	Arsenic	5.0
D005	Barium	100.0
D006	Cadmium	1.0
D007	Chromium	5.0
D008	Lead	5.0
D009	Mercury	0.2
D010	Selenium	1.0
D011	Silver	5.0
D012	Endrin (1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5,8-dimethano naphthalene.	0.02
D013	Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer.	0.4
D014	Methoxychlor (1,1,1-Trichloro-2,2-bis [p-methoxyphenyl]ethane).	10.0
D015	Toxaphene ($C_{10}H_{10}Cl_8$, Technical chlorinated camphene, 67-69 percent chlorine).	0.5
D016	2,4-D, (2,4-Dichlorophenoxyacetic acid).	10.0
D017	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid).	1.0

Subpart D—Lists of Hazardous Wastes

§ 261.30 General.

(a) A solid waste is a hazardous waste if it is listed in this Subpart, unless it has been excluded from this list under §§ 260.20 and 260.22.

(b) The Administrator will indicate his basis for listing the classes or types of wastes listed in this Subpart by employing one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
EP Toxic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)

Appendix VII identifies the constituent which caused the Administrator to list the waste as an EP Toxic Waste (E) or Toxic Waste (T) in §§ 261.31 and 261.32.

(c) Each hazardous waste listed in this Subpart is assigned an EPA Hazardous Waste Number which precedes the name of the waste. This number must be used in complying with the notification requirements of Section 3010 of the Act and certain recordkeeping and reporting requirements under Parts 262 through 265 and Part 122 of this Chapter.

(d) Certain of the hazardous wastes listed in § 261.31 or § 261.32 have exclusion limits that refer to § 261.5(c)(5).

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[2] This document is available from Solid Waste Information, U.S. Environmental Protection Agency, 26 W. St. Clair Street, Cincinnati, Ohio 45268.

[3] The NACE Standard is available from the National Association of Corrosion Engineers, P.O. Box 986, Katy, Texas 77450.

GEOSCIENCE CORP.

5 NORTHWAY LANE NORTH •
ATHAM, NEW YORK 12110
518)783-8102

April 26, 1984

Mr. John Bragg
Northeast Solite Corporation
P.O. Box 437
Mount Marion, NY 12456

Dear John:

On March 8, 1984, samples of crushed shale and coal were collected for chemical analysis. In addition, three samples of "virgin" in-place clay were collected from an area northeast of the polishing pond as shown in the accompanying map section. Clay samples were collected from depths as indicated below.

Sample	Depth Interval (Below grade)
1	3'3" - 3'9"
2	1'4" - 2'0"
3	1'9" - 2'3"

Laboratory analysis was performed by Bender Hygienic Laboratory (Albany, NY) and results are enclosed. It would appear that lead, arsenic and low-level selenium are indigenous to these areas.

Please don't hesitate to call if you have any questions or comments.

Very truly yours,

Sander

Sander I. Bonvell
Senior Chemist

SIB/cvl
Enclosure

Northeast Solite Corporation

March 8, 1984

Matrix Analyses

Parameter†	Coal	Shale	Soil #1	Soil #2	Soil #3
Phenols*	0.030	<0.025	<0.025	<0.025	<0.025
Chloride*	10	5	<5	<5	<5
Sulfate*	350	17.5	<12.5	<12.5	<12.5
Lead**	3.0(104)	2.4(94)	1.75(100)	2.5(96)	2.5(100)
Selenium**	0.16(98)	0.03(100)	0.02(100)	<0.01(105)	0.02(110)
Arsenic**	2.25(96)	2.1(94)	3.38(96)	5.25(98)	6.0(104)
% Moisture at 75°C	1.8	0.03	6.03	5.67	5.37

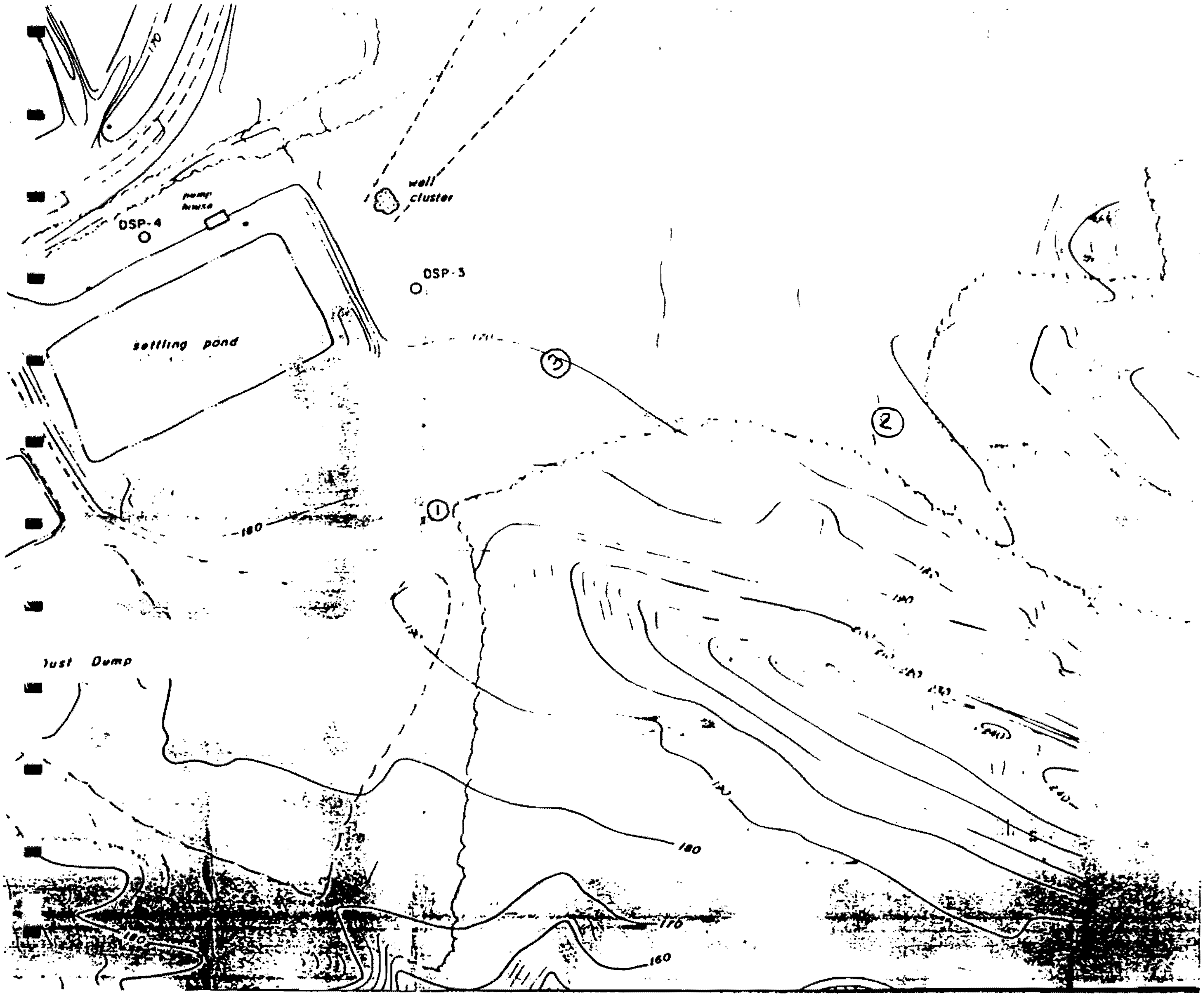
* Analysis performed on a wet weight basis.

** Analysis performed on samples dried at 75°C.

† Concentrations are expressed as mg/100 gm matrix.

Note: 1) Lead, selenium and arsenic analyses were performed by the method of standard additions.

2) Numbers in parentheses indicate the quality control percent recovery data.


170
pump house
DSP-4
well cluster
DSP-3
settling pond
170
③
②
①
180
Just Dump
180
180
170
180
160

ERCO

205 Alewife Brook Parkway, Cambridge, Massachusetts 02138-1101   617 661-3111

A DIVISION OF
ENSECO
INCORPORATED

An environmental services company

October 29, 1984

Sander Bonvell
Dunn Geoscience Corp.
5 Northway Lane North
Latham, NY 12110

Dear Sander:

Enclosed please find the results for the four samples received on October 4, 1984, and analyzed using the EPA 624 Method, 625 Method, and direct aqueous injection.

If you have any questions, please do not hesitate to call me.

Sincerely,

Jack Miano

Jack Miano
Analytical Chemist
VOA Laboratory

JM:rb
Encl.

ERCO
205 Alewife Brook Parkway, Cambridge, Massachusetts 02138-1101 617 661-3111

A DIVISION OF
ENSECO
INCORPORATED
An environmental services company

RECEIVED
NOV - 9 1984

November 8, 1984

Sander Bonvell
Dunn Geoscience Corp.
5 Northway Lane North
Latham, NY 12110

Dear Sander:

In response to your phone call, please note that the trace amounts of phthalates detected in the Northeast Solite Corp. sludge sample generated while the facility operated on liquid burnable materials (ERCO ID's 7867-7869) were of laboratory origin and should be disregarded. Please update your records to show this.

If you have any other questions, please do not hesitate to call.

Sincerely,

W. Henry Camp

Henry Camp
Analytical Scientist
VOA Laboratory

HC:rb
cc: Dallas Wait

ERCO

205 Alewife Brook Parkway, Cambridge, Massachusetts 02138-1101   617 661-3111

A DIVISION OF
ENSECO
INCORPORATED

An environmental services company

November 15, 1984

Mr. Sander Bonvell
Dunn Geoscience Corp.
5 Northway Lane North
Latham, NY 12110

Dear Sander:

Enclosed is the final data report reflecting the clerical changes you requested.

Sincerely,

Dallas Wait

A. Dallas Wait, Ph.D.
Director of Analytical
Services

ADW:ljk
Enclosure

cc: Thomas West, Albany, NY
David Evans, Richmond, VA

ERCO
205 Alewife Brook Parkway, Cambridge, Massachusetts 02138-1101 617 661-3111

A DIVISION OF
ENSECO
INCORPORATED
An environmental services company

November 20, 1984

Mr. Sander Bonvell
Dunn Geoscience Corp.
5 Northway Lane North
Latham, NY 12100

Dear Sander:

With regards to my analytical report which I sent to you on November 15, 1984, the compound xylene was inadvertently left off the volatile organic data report sheet. The compound xylene was analyzed for in all four samples, and was not found at the listed detection limit.

Sincerely,

Dallas Wait

A. Dallas Wait, Ph.D.
Director of Analytical Services

ADW:ljk

cc: Thomas West, Albany, NY
David Evans, Richmond, VA

Sample Received: 10/4/84
Analysis Completed: 10/6/84
Results in: ug/l (ppb)
Reported by: NA
Checked by: JFM AAW

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -
Page 1 of 2

Client: Dunn Geoscience

COMPOUNDS	Client ID: ERCO ID:	NW 7866	NE 7867	SE 7868	SE 7869
Chloromethane		ND	ND	ND	ND
Bromomethane		ND	ND	ND	ND
Vinyl chloride		ND	ND	ND	ND
Chloroethane		ND	ND	ND	ND
Methylene chloride		ND	ND	ND	ND
1,1-dichloroethylene		ND	ND	ND	ND
1,1-dichloroethane		ND	ND	ND	ND
Trans-1,2-dichloroethylene		ND	ND	ND	ND
Chloroform		ND	ND	ND	ND
1,2-dichloroethane		ND	ND	ND	ND
1,1,1-trichloroethane		ND	ND	ND	ND
Carbon tetrachloride		ND	ND	ND	ND
Bromodichloromethane		ND	ND	ND	ND
1,2-dichloropropane		ND	ND	ND	ND
Trans-1,3-dichloropropylene		ND	ND	ND	ND
Trichloroethylene		ND	ND	ND	ND
Benzene		ND	ND	ND	ND
Dibromochloromethane		ND	ND	ND	ND
Cis-1,3-dichloropropylene		ND	ND	ND	ND
1,1,2-trichloroethane		ND	ND	ND	ND
Bromoform		ND	ND	ND	ND
1,1,2,2-tetrachloroethane		ND	ND	ND	ND
Tetrachloroethylene		ND	ND	ND	ND
Toluene		ND	ND	ND	ND
Chlorobenzene		ND	ND	ND	ND
Ethyl benzene		ND	ND	ND	ND
2-chloroethyl vinyl ether		ND	ND	ND	ND

ND = Not detected.

ERCO / A Division of ENSECO
VOLATILE ORGANICS ANALYSIS
BY EPA METHOD 624
- Data Report -
Page 2 of 2

Client: Dunn Geoscience

COMPOUNDS	Client ID: ERCO ID:	NW 7866	NE 7867	SE 7868	SE 7869
Additional Compounds					
Acetone		ND	ND	ND	ND
Carbon disulfide		ND	ND	ND	ND
Cyclohexanone		ND	ND	ND	ND
Ethyl acetate		ND	ND	ND	ND
Ethyl ether		ND	ND	ND	ND
Methyl ethyl ketone		ND	ND	ND	ND
Methyl isobutyl ketone		ND	ND	ND	ND
Trichlorofluoromethane		ND	ND	ND	ND
1,1,2-trichloro-1,2,2,-trifluoroethane		ND	ND	ND	ND
Reporting Limit:		4	4	4	4

CLIENT Dunn Geoscience
CLIENT ID NW
ERCO ID 13-7866
SAMPLE RECEIVED 10/4/84
ANALYSIS COMPLETED 10/17/84
RESULTS IN ug/kg (ppb)

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

ACID COMPOUNDS

21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND
	Cresylic Acids	ND

BASE/NEUTRAL COMPOUNDS

1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	ND
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND

BASE/NEUTRAL COMPOUNDS

42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate -------	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate ------------	*
69B	di-n-octyl phthalate ------------	*
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 5000 ppb for acids and for B/N.

*Trace concentrations detected below the average reporting limit.

Reported by:
Checked by:

CLIENT Dunn Geoscience
CLIENT ID SE
ERCO ID 13-7869
SAMPLE RECEIVED 10/4/84
ANALYSIS COMPLETED 10/17/84
RESULTS IN ug/kg (ppb)

ERCO / A Division of ENSECO

SUMMARY OF
ORGANIC PRIORITY POLLUTANT ANALYSIS

ACID COMPOUNDS

21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dini~~tro-o-cresol~~	~~ND~~
64A	pentachlorophenol	ND
65A	phenol	ND
	Cresylic Acids	

BASE/NEUTRAL COMPOUNDS

1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	ND
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND

BASE/NEUTRAL COMPOUNDS

42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
~~62B~~	~~N-nitrosodiphenylamine~~	~~ND~~
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate -------	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate -------------	*
69B	di-n-octyl phthalate -------------	*
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 2000 ppb for acids and for B/N.

*Trace concentrations detected below the average reporting limit.

Reported by:
Checked by:

CLIENT Dunn Geoscience
CLIENT ID NE
ERCO ID 13-7867
SAMPLE RECEIVED 10/4/84
ANALYSIS COMPLETED 10/17/84
RESULTS IN ug/kg (ppb)

ERCO / A Division of ENSECO

SUMMARY OF ORGANIC PRIORITY POLLUTANT ANALYSIS

ACID COMPOUNDS

21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	ND
	creslic acids	ND

BASE/NEUTRAL COMPOUNDS

1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	ND
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND

BASE/NEUTRAL COMPOUNDS

42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate -------	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate -------------	*
69B	di-n-octyl phthalate -------------	*
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 4800 ppb for acids and for B/N.

*Trace concentrations detected below the average reporting limit.

Reported by:
Checked by:

CLIENT Dunn Geoscience
CLIENT ID SW
ERCO ID 13-7868
SAMPLE RECEIVED 10/4/84
ANALYSIS COMPLETED 10/17/84
RESULTS IN ug/kg (ppb)

ERCO / A Division of ENSECO

SUMMARY OF ORGANIC PRIORITY POLLUTANT ANALYSIS

ACID COMPOUNDS

21A	2,4,6-trichlorophenol	ND
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	ND
31A	2,4-dichlorophenol	ND
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
~~64A~~	~~pentachlorophenol~~	~~ND~~
65A	phenol	ND
	cresylic acids	ND

BASE/NEUTRAL COMPOUNDS

1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	ND
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	ND
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	ND
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	ND
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND

BASE/NEUTRAL COMPOUNDS

42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	ND
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
~~63B~~	~~N-nitrosodi-n-propylamine~~	~~ND~~
66B	bis(2-ethylhexyl)phthalate -------	*
67B	butyl benzyl phthalate	ND
68B	di-n-butyl phthalate -------------	*
69B	di-n-octyl phthalate -------------	*
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

ND = None detected above the average reporting limit of 4300 ppb for acids and for B/N.

*Trace concentrations detected below the average reporting limit.

Reported by:
Checked by:

Sample Received:	10/4/84
Analysis Completed:	10/24/84
All Results in:	ug/g (ppm)
Reported by:	wth
Checked by:	JFM

ERCO / A Division of ENSECO

VOLATILE ORGANICS ANALYSIS BY DIRECT AQUEOUS INJECTION

- Data Report -

Client: Dunn Geoscience Corp.

Compounds	Client ID: ERCO ID:	NW 7866	NE 7867	SW 7868	SE 7869	NW (Spike) 7870 (Spike)
Methanol		ND	ND	ND	ND	270 (90%)
Isobutyl alchohol		ND	ND	ND	ND	520 (84%)
n-butyl alcohol		ND	ND	ND	ND	390 (83%)
Pyridine		ND	ND	ND	ND	650 (92%)
Minimum reporting limit		42	32	16	21	27

ND = None detected at or above reporting limit.

APPENDIX B

Groundwater Polishing Pond Analytical Summary
Cluster Well Protocol

Northeast Solite Corporation
Upgradient Well USP-1A

Parameter*	June	July	August
Conductivity	460	625	580
Chloride	16	5	9
Sulfate, F	70	85	170
Phenols	0.054	<0.005	<0.005
pH	6.7	7.3	6.6
Lead	0.94	0.190	0.830
Lead, F	<0.010	0.014	<0.010
Selenium	0.003	<0.002	0.004
Selenium, F	<0.002	<0.002	<0.002
Arsenic	0.028	0.03	<0.02
Arsenic, F	IS	<0.02	<0.02
Antimony	<0.5	<1	0.5
Antimony, F	<0.5	<1	<0.5

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

F = Field filtered through 0.45 micron cellulose prior to acid preservation.

Northeast Solite Corporation

Cluster Well DSP-2A

Parameter*	January**	June	July	August
Conductivity	--	1,340	1,510	1,510
Chloride	168, 206	346	560	500
Sulfate, F	140, 140	145	180	150
Phenols	--	0.021	<0.005	<0.005
pH	--	7.7	7.7	7.7
pH, F	--	8.1	8.2	7.9
Lead	0.102, 0.070	0.025	0.370	0.241
Lead, F	0.068, <0.010	<0.010	<0.010	<0.010
Selenium	--	<0.002	<0.002	<0.002
Selenium, F	--	<0.002	<0.002	<0.002
Arsenic	--	<0.02	0.067	0.073
Arsenic, F	--	<0.02	<0.020	<0.020
Antimony	--	<0.5	<1	<0.5
Antimony, F	--	<0.5	<1	<0.5

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

** Double results represent before and after well exercising, respectively, as written.

F = Field filtered through 0.45 micron cellulose prior to acid preservation.

Northeast Solite Corporation
Cluster Well DSP-2B

Parameter*	January**	June	July	August
Conductivity	--	11,800	17,700	17,200
Chloride	4700, 3900	7,500	13,250	11,500
Sulfate, F	840, 820	1,100	1,050	1,125
Phenols	--	0.18	<0.005	<0.005
pH	--	6.9	6.8	6.8
pH, F	--	7.2	7.1	6.9
Lead	0.016, 0.014	0.054	0.070	0.064
Lead, F	<0.010, <0.010	<0.010	<0.010	<0.010
Selenium	--	<0.002	<0.002	<0.002
Selenium, F	--	<0.002	<0.002	<0.002
Arsenic	--	<0.02	<0.02	0.05
Arsenic, F	--	<0.02	<0.02	<0.02
Antimony	--	0.9	<1	2.0
Antimony, F	--	0.9	<1	1.5

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

** Double results represent before and after well exercising, respectively, as written.

F = Field filtered through 0.45 micron cellulose prior to acid preservation.

Northeast Solite Corporation

Cluster Well DSP-2C

Parameter*	January**	June	July	August
Conductivity	--	2,150	9,180	9,250
Chloride	2600, 1150	1,020	5,300	3,700
Sulfate, F	580, 440	230	825	860
Phenols	--	0.12	<0.005	<0.005
pH	--	7.2	6.9	7.1
pH, F	--	7.5	7.3	7.2
Lead	0.110, 0.090	0.065	0.015	0.040
Lead, F	<0.010, <0.010	<0.010	<0.010	<0.010
Selenium	--	<0.002	<0.002	<0.002
Selenium, F	--	<0.002	<0.002	<0.002
Arsenic	--	<0.02	<0.02	<0.02
Arsenic, F	--	<0.02	<0.02	<0.02
Antimony	--	<0.5	<1	0.8
Antimony, F	--	<0.5	<1	0.7

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

** Double results represent before and after well exercising, respectively, as written.

F = Field filtered through 0.45 micron cellulose prior to acid preservation.

Northeast Solite Corporation

Cluster Well DSP-2D

Parameter*	January**	June	July	August
Conductivity	--	1,020	1,780	1,820
Chloride	120, 310	447	645	664
Sulfate, F	94, 115	150	185	180
Phenols	--	0.056	<0.005	<0.005
pH	--	7.6	7.4	7.3
pH, F	--	7.8	7.8	7.6
Lead	2.3, 0.030	0.083	0.017	0.060
Lead, F	***, <0.010	<0.010	<0.010	<0.010
Selenium	--	<0.002	<0.002	<0.002
Selenium, F	--	<0.002	<0.002	<0.002
Arsenic	--	<0.02	<0.02	<0.02
Arsenic, F	--	<0.02	<0.02	<0.02
Antimony	--	<0.5	<1	<0.5
Antimony, F	--	<0.5	<1	<0.5

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

** Double results represent before and after well exercising, respectively, as written.

*** Would not pass 0.45 micron filter or pre-filter for sufficient volume.

F = Field filtered through 0.45 micron cellolose prior to acid preservation.

Northeast Solite Corporation
Cluster Well DSP-2E

Parameter*	January**	June	July	August
Conductivity	--	770	820	850
Chloride	16, 112	180	84	97
Sulfate, F	64, 69	40	42	37
Phenols	--	0.056	<0.005	<0.005
pH	--	7.5	7.4	7.5
pH, F	--	7.7	7.8	7.7
Lead	0.197, 0.110	0.075	0.028	0.045
Lead, F	0.042, <0.010	<0.010	<0.010	<0.010
Selenium	--	<0.002	<0.002	<0.002
Selenium, F	--	<0.002	<0.002	<0.002
Arsenic	--	<0.02	<0.02	<0.02
Arsenic, F	--	<0.02	<0.02	<0.02
Antimony	--	<0.5	<1	0.5
Antimony, F	--	<0.5	<1	<0.5

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

** Double results represent before and after well exercising, respectively, as written.

F = Field filtered through 0.45 micron cellulose prior to acid preservation.

Northeast Solite Corporation

Cluster Well DSP-2F

Parameter*	January**	June	July	August
Conductivity	--	2400	1730	1770
Chloride	425, 1300	697	440	86
Sulfate, F	210, 470	380	260	155
Phenols	--	0.21	<0.005	<0.005
pH	--	7.3	7.4	7.6
pH, F	--	8.2	7.9	7.7
Lead	1.75, 0.040	0.033	0.034	0.023
Lead, F	0.046, <0.010	<0.010	0.012	<0.010
Selenium	--	<0.002	<0.002	<0.002
Selenium, F	--	<0.002	<0.002	<0.002
Arsenic	--	<0.02	<0.02	<0.02
Arsenic, F	--	<0.02	<0.02	<0.02
Antimony	--	<0.5	<1	0.5
Antimony, F	--	<0.5	<1	<0.5

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

** Double results represent before and after well exercising, respectively, as written.

F = Field filtered through 0.45 micron cellolose prior to acid preservation.

Northeast Solite Corporation

Downgradient Well DSP-2

Parameter*	September 1983	November 1983	January 1984	April 1984
Chloride	1,300	2,400	672	4,360
Sulfate	800	489	320	732
Phenols	0.07	0.06	0.02	0.140
pH	6.7	7.1	7.1	7.1
Lead, F	0.150	0.003	0.025	0.186
Selenium, F	0.078	0.006	0.024	0.054
Arsenic, F	0.07	<0.001	0.003	<0.002

* All units in mg/L (ppm) except pH (units).

F = Field filtered through 0.45 micron cellulose prior to acid preservation.

Northeast Solite Corporation

Downgradient Well DSP-3

Parameter*	September 1983	November 1983	January 1984	April 1984	June 1984	July 1984	August 1984
Conductivity	--	--	--	--	5,400	5,500	5,620
Chloride	1,380	2,350	1,870	1,570	2,830	2,800	2,340
Sulfate	432	394	360	393	480	460	480
Phenols	0.08	0.05	0.07	0.08	0.053	0.005	<0.005
pH	6.5	6.9	6.7	7.2	6.9	6.9	6.9
Lead	--	--	--	--	<0.010	0.016	0.020
Lead, F	0.060	0.002	0.113	0.026	<0.010	<0.010	<0.010
Selenium	--	--	--	--	<0.002	<0.002	<0.002
Selenium, F	0.066	0.010	0.05	0.025	<0.002	<0.002	<0.002
Arsenic	--	--	--	--	<0.02	<0.02	<0.02
Arsenic, F	0.005	0.001	0.003	0.002	<0.02	<0.02	<0.02
Antimony	--	--	--	--	<0.5	<1	0.9
Antimony, F	--	--	--	--	<0.5	<1	0.9

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

F = Field filtered through 0.45 micron cellulose prior to acid preservation.

Northeast Solite Corporation

Downgradient Well DSP-4

Parameter*	September 1983	November 1983	January 1984	April 1984	June 1984	July 1984	August 1984
Conductivity	--	--	--	--	980	1,060	1,060
Chloride	39	172	252	60	101	76	69
Sulfate	408	31	390	199	138	180	220
Phenols	0.04	0.02	0.01	0.02	0.05	<0.005	<0.005
pH	6.3	7.3	6.2	7.5	7.2	7.2	7.2
Lead	--	--	--	--	<0.010	0.075	0.020
Lead, F	0.009	0.001	0.025	0.006	--	--	<0.010
Selenium	--	--	--	--	<0.002	<0.002	<0.002
Selenium, F	0.010	<0.002	0.017	0.004	--	--	--
Arsenic	--	--	--	--	<0.02	<0.02	<0.029
Arsenic, F	0.003	<0.001	<0.002	0.002	--	--	--
Antimony	--	--	--	--	<0.5	<1	<0.5

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).

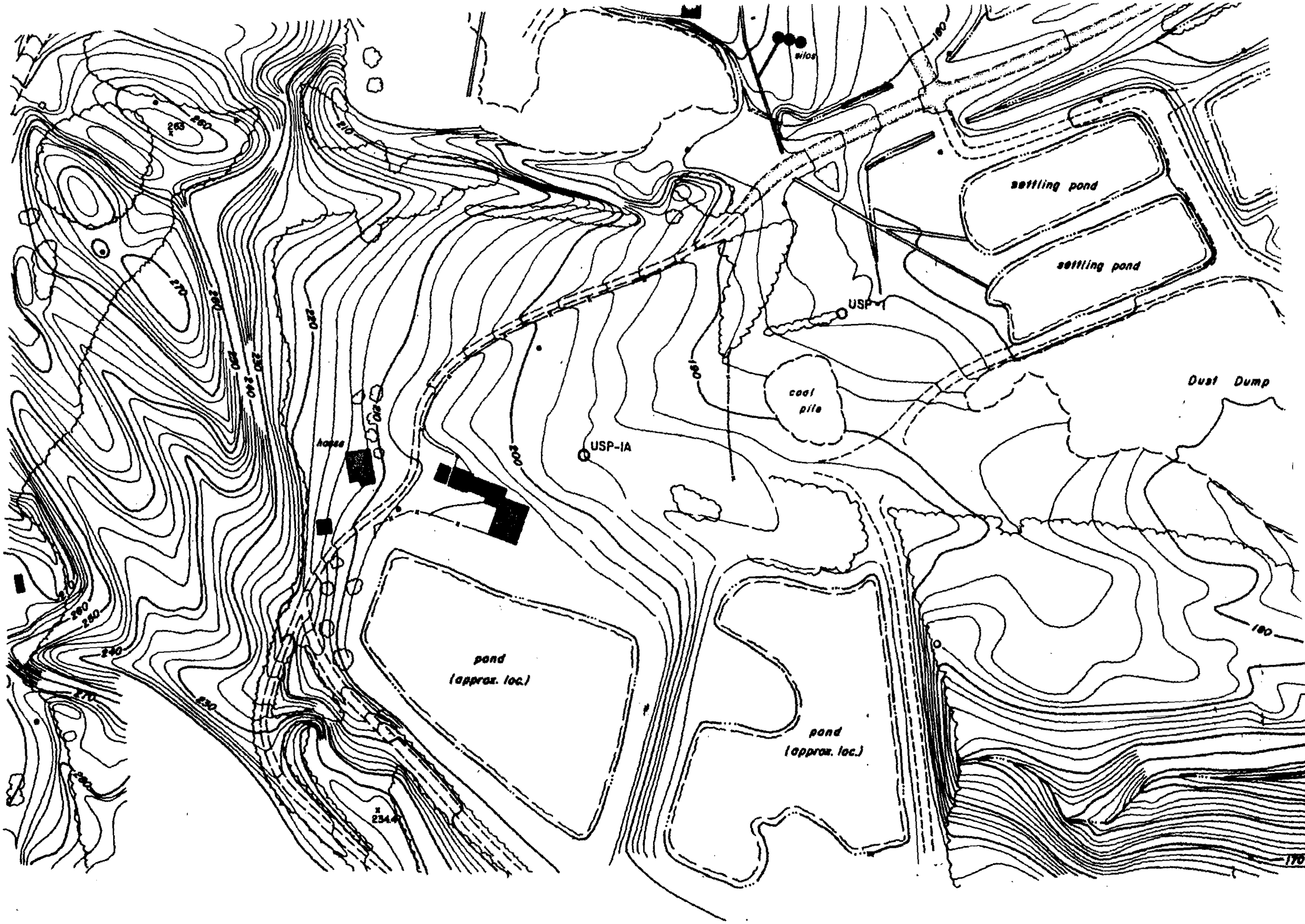
F = Field filtered through 0.45 micron cellolose prior to acid preservation.

Northeast Solite Corporation

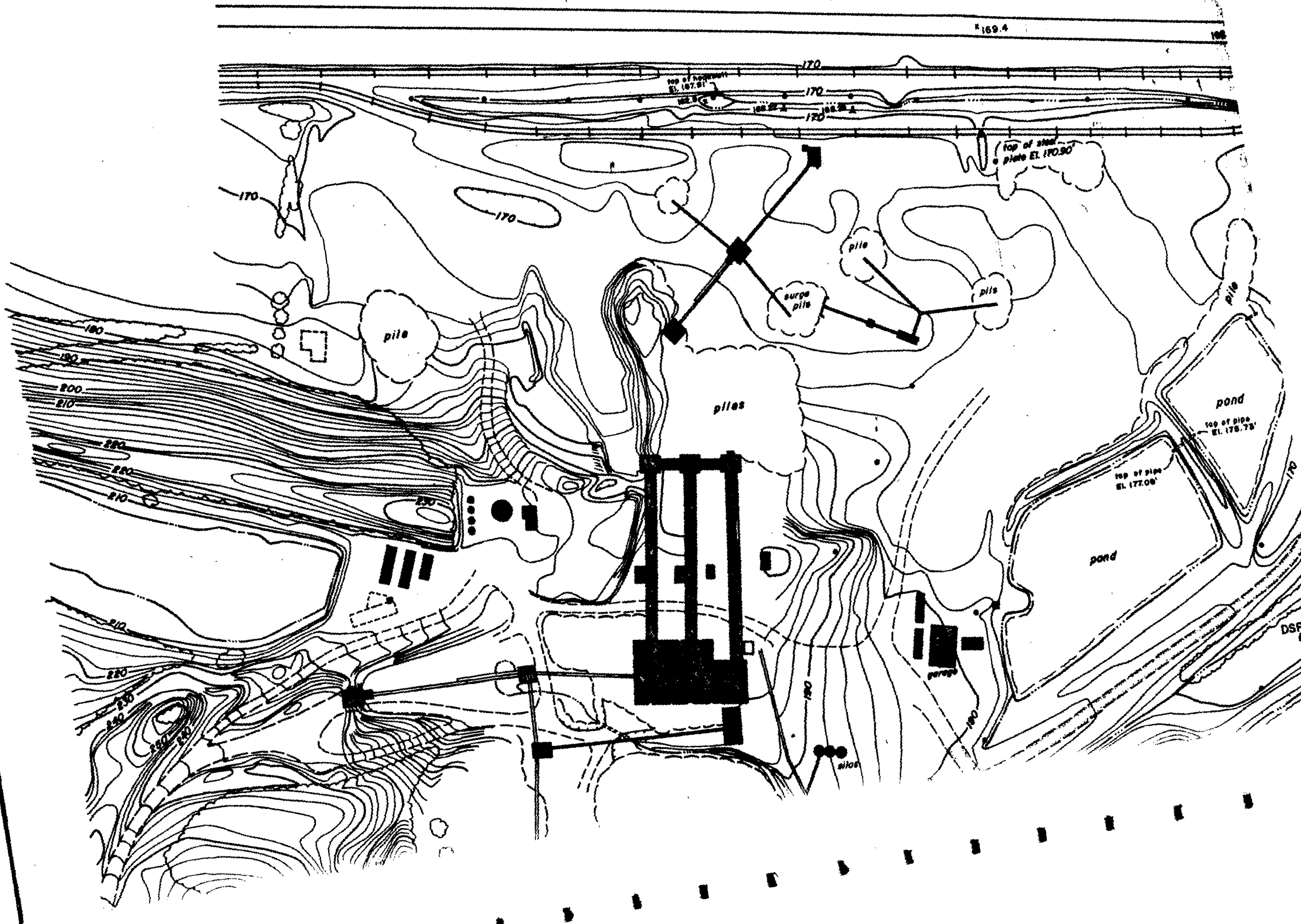
Polishing Pond

Parameter *	June	July	August
Conductivity	20,500	32,400	32,200
Chloride	12,500	18,000	11,500
Sulfate (filtered)	3,100	2,300	3,400
Phenols	BMDL	BMDL	BMDL
pH	3.1	2.2	2.7
Lead, Total	3.55	2.00	0.287
Selenium, Total	0.049	0.182	0.040
Arsenic, Total	0.146	2.30	0.66
Antimony, Total	0.9	< 1	1.8

* All units in mg/L (ppm) except pH (units) and conductivity (umhos/cm).



settling pond
settling pond
silos
USP-1
coal pile
Dust Dump
USP-1A
house
pond (approx. loc.)
pond (approx. loc.)
263
260
270
280
250
240
230
220
210
200
190
180
170
234.4



×169.4
170
top of headwall
El. 167.91'
170
170
top of steel
plate El. 170.90'
170
170
pile
surge
pile
pile
pile
pile
piles
180
190
200
210
220
220
210
230
210
220
230
230
250
240
pond
top of pipe
El. 176.75'
top of pipe
El. 177.09'
pond
170
garage
180
190
silos
DSF

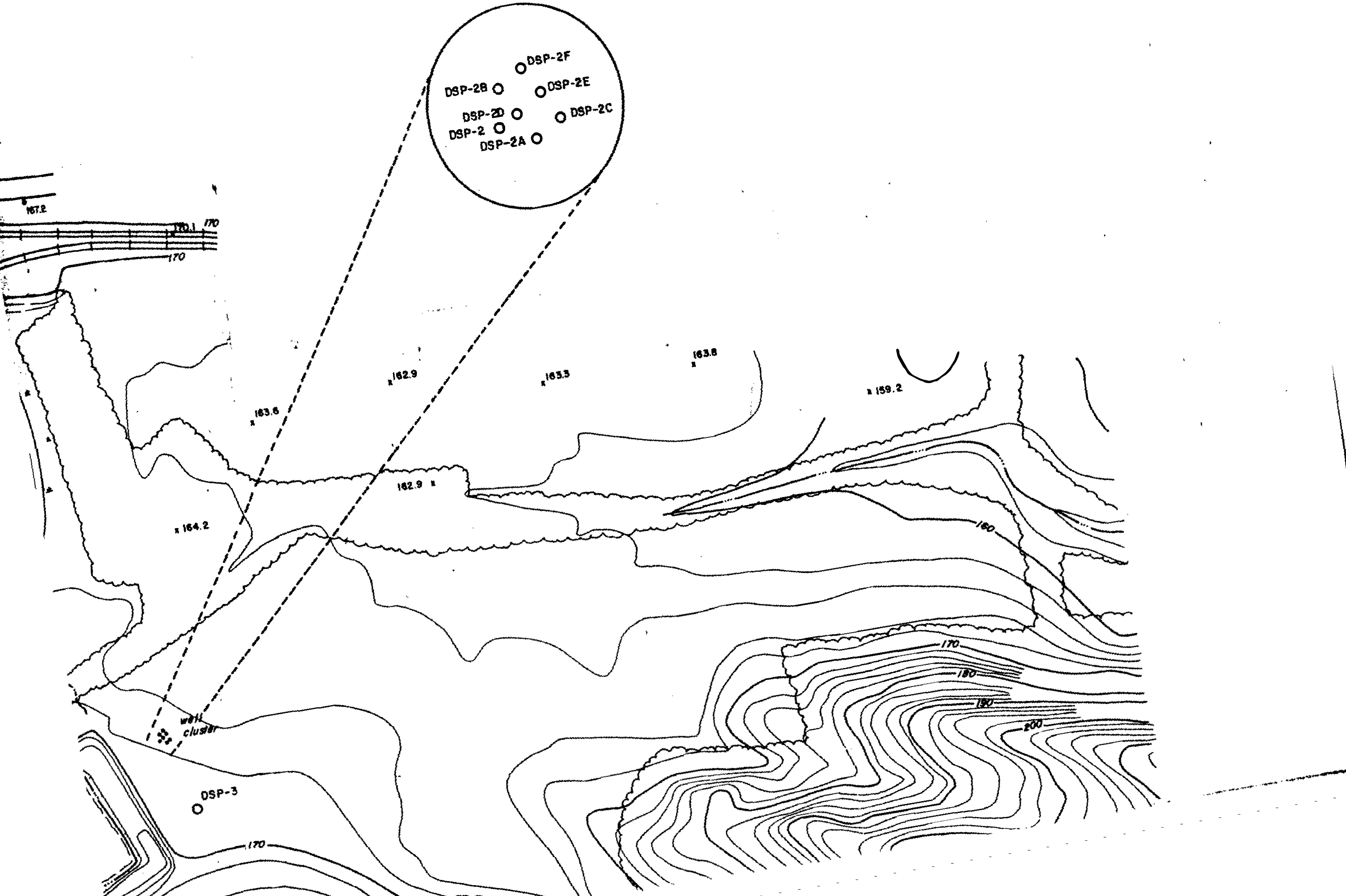

DSP-2F
DSP-2B
DSP-2E
DSP-2D
DSP-2C
DSP-2
DSP-2A
167.2
170.1
170
170
162.9
163.3
163.8
159.2
163.6
162.9
164.2
160
170
180
190
200
well cluster
DSP-3
170

PLATE I

LOCATION OF MONITORING WELLS
NORTHEAST SOLITE CORPORATION

TOWN OF SAUGERTIES — ULSTER COUNTY, N.Y.

PROJ. MANAGER:
William J. Holl
PREPARED BY:
Gary O. Casper
DRAFTED BY:
Michael T. Mdkaympik

PROJECT NO.
05-257-5-2870
SHEET OF

MAP NO.
6453
DATE:
March 12, 1984

SCALE: IN FEET