ESI
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January 18, 1995

Mr. Bobby Lutfy
North Carolina Department of Environment
Health and Natural Resources
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Subject: Hydrogeologic Review and Monitoring Plan
North Mecklenburg Construction and Demolition Landfill
Permit # 60-13
ESI Project No. ES-0675

Dear Mr. Lutfy:

As discussed during our meeting at North Mecklenburg landfill on January 12, 1995, I am providing the following letter to document certain hydrogeologic aspects discussed during the meeting and to provide a monitoring plan for the site.

During our meeting we discussed two primary concerns associated with the subject site:

- The minimum four foot vertical separation between the bottom elevation of solid waste and the seasonal high water table and /or bedrock; and
- The development of an effective groundwater monitoring plan to account for shallow groundwater characteristics at the site.

Given the undulatory nature of the bedrock surface at the subject site and the relatively shallow depth to bedrock identified in soil boring SB-3, the landfill base elevations were revised by Frank Hick's Engineering in order to maintain the appropriate 4 foot minimum separation above this point. Having performed a site walkover during our January 12th meeting, it appears that numerous discontiguous large boulders have been encountered and removed during grading operations at the site. Two 20 foot trenches were advanced during the site walkover to demonstrate the ability to remove cover soil from the Phase II area and to observe soil characteristics at depth. Based on the results of the January 12th meeting and site walkover, it is my understanding that a sufficient comfort level with the current grading plan and the depth to bedrock has been established.

Monitoring well construction details and locations were also reviewed during the January 12th meeting. A summary table of well construction details and depth to water gauging data has been included with this letter to provide a portion of the necessary information required to formulate a monitoring plan for the subject site. A phreatic surface contour map using the latest gauging data has also been included.

Based on the relatively deep screened intervals present in monitoring wells MW-1, MW-4, and MW-6, additional monitoring wells screened at a shallower depth will be required in these areas. A new shallow monitoring well will also be required in the northeastern most corner of the site. The locations of each proposed monitoring well are illustrated on the attached figure.

Following the installation of the new wells, existing monitoring wells MW-2, MW-3, MW-6, and all peizometers will be abandoned in accordance with State guidelines. To provide adequate perimeter monitoring the following wells will be sampling:

- MW-1a (new)
- MW-4a (new)
- MW-4 (existing)
- MW-6 (new)
- MW-8 (existing)
- MW-10 (existing)
- MW-11 (new shallow well in NE corner)

All groundwater samples will be properly preserved and shipped to a North Carolina approved analytical laboratory for chemical analysis as outlined in the attached Solid Waste Section Sampling and Analysis Requirements (Appendix A). Appropriate chain-of-custody records will be maintained during each stage of sample collection and transportation.

At the completion of each semi-annual sampling event, a summary of our field activities, collected data, and laboratory results will be forwarded to the DEHNR-Solid Waste Management in a letter report.

ESI trusts the information provided will meet the remaining requirements for permit approval at the North Mecklenburg Construction and Demolition Landfill. Please do not hesitate to contact me if you have any questions or require additional information.

Sincerely,
ECOLOGICAL SERVICES, INC.

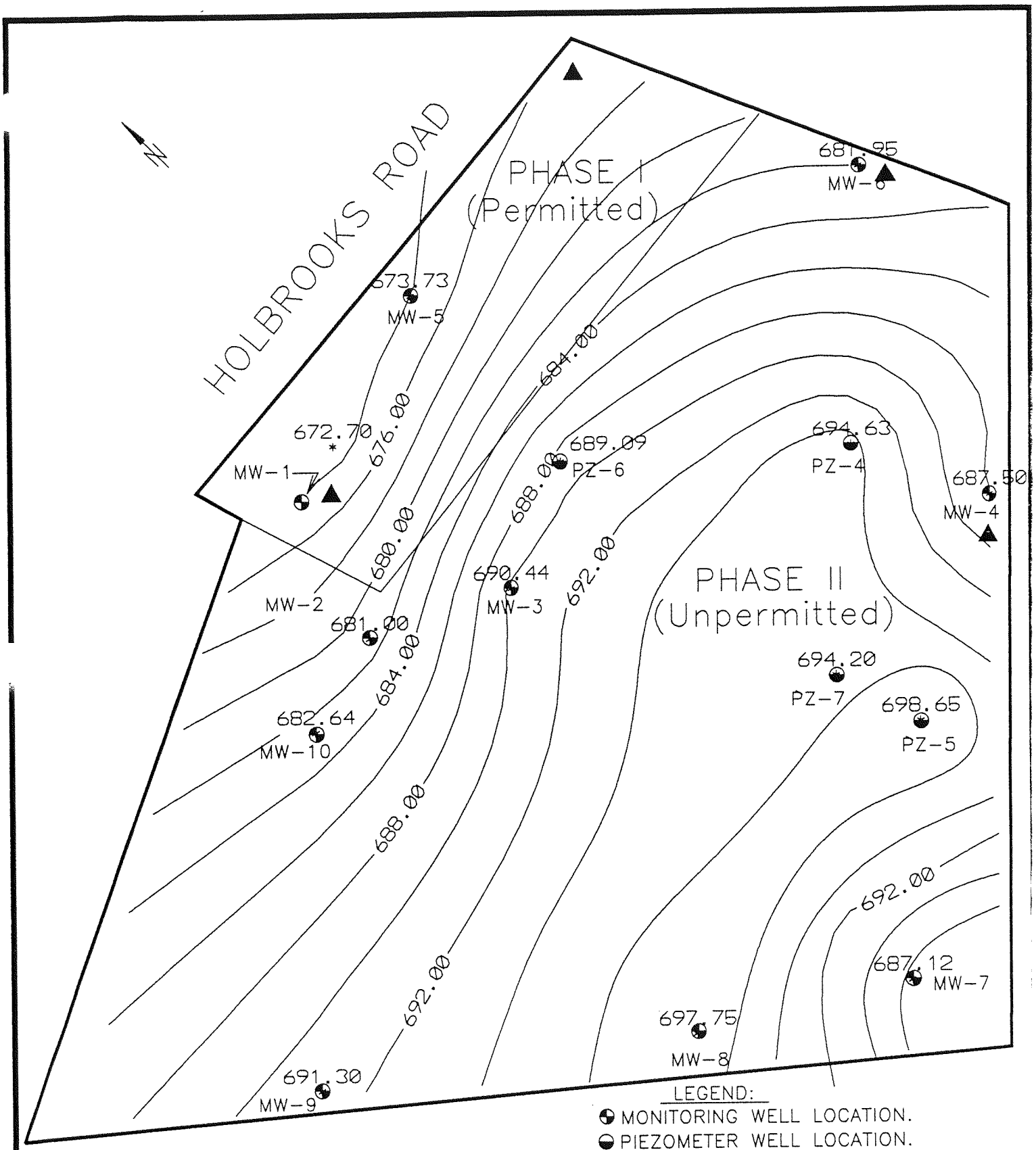
Paul A. Banks
Project Geologist

cc: Mr. Larry Griffin, Sr.
Ms. Janis McHargue

SUMMARY TABLE OF WELL CONSTRUCTION DETAILS AND GAUGING DATA

I.D.	Total Well Depth	Screen Interval	Feb. 10, 94 DTW	May 5, 94 DTW	May 27, 94 DTW	Jan. 13, 95 DTW
MW-1	40	25-40	14.61	NG	NG	15.00
MW-2	19	9-19	13.59	12.4	16.8	10.00
MW-3	53	38-53	16.96	14.58	17.57	16.00
MW-4	97	65-90	28.99	28.95	29.22	30.50
MW-5	55	40-55	NG	NG	NG	27.50
MW-6	98	78-98	58.59	58.15	50.15	58.67
MW-7	83	63-83	51.36	50.93	50.91	51.50
MW-8	80	60-80	69.71	69.42	69.45	69.50
MW-9	22	12-22	18.73	18.42	18.92	17.80
MW-10	19	9-19	11.85	12.2	11.01	10.00

NG = Not Gauged
Shaded piezometers are abandoned



NOTE: Gauging Data Obtained on Jan. 13, 1995

DATE: 01-19-95
SCALE: 1" = 200'
DWG. NO.: NMECKLET

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PHREATIC SURFACE MAP AND
PROPOSED MONITORING LOCATIONS
N. MECK. LANDFILL
HUNTERSVILLE, NC

APPENDIX A
Sampling and Analysis Requirements

SAMPLING AND ANALYSIS REQUIREMENTS
N.C. SOLID WASTE SECTION

LAB CERTIFICATION REQUIREMENTS:
The Solid Waste Section now requires water quality sample analysis by a laboratory certified by the Division of Environmental Management for groundwater analysis (15A NCAC 2H .0800). The laboratories used for water quality analysis for Solid Waste Section facilities shall be certified under the Division of Environmental Management (DEM) Certification program for the approved methods and at the approved levels of certification.

SAMPLING ANALYTICAL METHODS AND REPORTING LIMITS:
Each parameter on the following constituent list shall be certified at the designated level and an appropriately certified method used for the sample analysis. The data shall be reported at the specified Practical Quantitation Limit (PQL).

Parameter	Certification by DEM	PQL in ppb
Arsenic	Metals, Group I - low level	10
Barium	Barium (20)	500
[illegible]nium	Metals, Group I - low level	1
C[illegible]omium	Metals, Group I - low level	10
Lead	Metals, Group I - low level	10
Mercury	Metals (21)	1
Selenium	Metals, Group I - low level	20
Silver	Metals, Group II - low level	10

Volatile Organic Compounds
For the parameters and PQLs required for volatile organic compound analysis, refer to the next page of this attachment. For volatile organic analysis the laboratory shall be certified for an SW-846 GC/MS Method (8240 or 8260). The recommended method of analysis is EPA Method 8260

SAMPLING AND ANALYSIS:
In addition to sampling for the constituents referenced above, all sampling should also include field testing of pH, temperature, and specific conductivity. EPA requires analysis for total metals. No filtering of samples is allowed. The 3030C preparation method for metals analysis is not allowed.

VOLATILE ORGANIC COMPOUNDS

GANIC TUENT	PQL (UG/L)	ORGANIC CONSTITUENT	PQL (UG/L)
ACETONE	100	(40) T-1,3-DICHLOROPROPENE	10
ACRYLONITRILE	200	(41) ETHYLBENZENE	5
BENZENE	5	(42) METHYL BUTYL KETONE	50
BROMOCHLOROMETHANE	5	(43) METHYL BROMIDE	10
BROMODICHLOROMETHANE	5	(44) METHYL CHLORIDE	10
BROMOFORM	5	(45) METHYLENE BROMIDE	10
CARBON DISULFIDE	100	(46) METHYLENE CHLORIDE	10
CARBON TETRACHLORIDE	10	(47) MEK; 2-BUTANONE	100
CHLOROBENZENE	5	(48) METHYL IODIDE	10
CHLOROETHANE	10	(49) METHYL ISOBUTYL KETONE	100
CHLOROFORM	5	(50) STYRENE	10
CHLORODIBROMOMETHANE	5	(51) 1,1,1,2-TETRACHLOROETHANE	5
BCP	25	(52) 1,1,2,2-TETRACHLOROETHANE	5
THYLENE DIBROMIDE	5	(53) TETRACHLOROETHYLENE	5
-DICHLOROBENZENE	5	(54) TOLUENE	5
HLOROBENZENE	5	(55) 1,1,1,-TRICHLOROETHANE	5
1,4-DICHLORO-2-BUTENE	100	(56) 1,1,2-TRICHLOROETHANE	5
-DICHLOROETHANE	5	(57) TRICHLOROETHYLENE	5
THYLENE DICHLORIDE	5	(58) CFC-11	5
NYLIDENE CHLORIDE	5	(59) 1,2,3-TRICHLOROPROPANE	15
-1,2-DICHLOROETHENE	5	(60) VINYL ACETATE	50
,2-DICHLOROETHENE	5	(61) VINYL CHLORIDE	10
OPYLENE DICHLORIDE	5	(62) XYLENES	5
-1,3-DICHLOROPROPENE	10		

OWN AS: (21)-TRIBROMOMETHANE, (25)-ETHYL CHLORIDE, (26)-TRICHLOROMETHANE, OMOCHLOROMETHANE, (28)-1,2-DIBROMO-3-CHLOROPROPANE, (29)-1,2-DIBROMOETHANE, ICHLOROBENZENE, (31)-1,4-DICHLOROBENZENE, (33)-ETHYLIDENE CHLORIDE, CHLOROETHANE, (35)-1,1-DICHLOROETHENE (ETHYLENE), (36)-CIS-1,2-DICHLOROETHYLENE, IS-1,2-DICHLOROETHYLENE, (38)-1,2-DICHLOROPROPANE, (42)-2-HEXANONE, (43)-BROMOMETHANE, ROMETHANE, (45)-DIBROMOMETHANE, (46)-DICHLOROMETHANE, (47)-METHYL ETHYL KETONE, METHANE, (49)-4-METHYL-2-PENTANONE, (53)-TETRACHLOROETHENE, PERCHLOROETHYLENE, TYLCHLOROFORM, (57)-TRICHLOROETHENE, (58)-TRICHLOROFLUOROMETHANE