HERCULES
CHEMICAL SPECIALTIES

Hercules Incorporated
613 West 7th Street
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July 31, 1997

Certified Mail - Return Receipt Requested
Cert. # P 443 543 535

RECEIVED
AUG - 4 1997
Dept. of Environmental Quality
Office of Pollution Control

Mr. Brian Young
Office of Pollution Control
P. O. Box 10385
Jackson, MS 39289-0385

RE: Groundwater Investigation, Hattiesburg
Response to May 19, 1997 Letter

Dear Mr. Young:

Please find the following response to the Mississippi Department of Environmental Quality (MDEQ) May 19, 1997, letter and our subsequent conversations addressing your request.

Our understanding, based on prior correspondence, is that MDEQ believes that there is a need for investigation at the Hattiesburg plant site in Hattiesburg to confirm that no contamination exists in groundwater migrating off-site at levels that would trigger further action based on regulatory standards. To address this concern, we have obtained the services of an outside contractor (Bonner Analytical Testing Company) to perform the voluntary groundwater monitoring work described in the attached work plan.

To summarize the plan, Hercules will install and sample five down gradient perimeter wells and one up gradient perimeter well in the shallow saturated zone. The wells will be constructed as specified in your May 19, 1997 letter. The wells will be sampled quarterly for one year for the work plan compound list (CL) of volatile organics using Method 8260. The CL results will be compared to the highest of: (1) background; (2) the practical quantitation limit; and (3) the Mississippi Groundwater Quality Standards (GQS). For each CL constituent that is below the highest of such standards, it is our understanding that no further investigation, including monitoring, or remediation will be required for that constituent at the plant site. For any constituent that is above the highest of such standards, Hercules understands that before further action is required, it will have the option of demonstrating that an alternative standard should be used for comparison purposes. This is necessary in light of the fact that GQS rule assumes that the affected groundwater is potable, which is not the case under and around our site. Moreover, Section 3(E)(1) of the GQS rule itself allows for establishment of alternative standards.

Once we have received your approval of the work plan, including confirmation of these understandings, we will proceed to implement the work plan. We welcome the opportunity to discuss this proposal with you further and to answer any questions you may have. Please call me at (601) 545-3450, extension 360 for that purpose.

Very truly yours,

HERCULES INCORPORATED

Charles S. Jordan
Environmental Coordinator

Attachment:

Installation of Six Monitoring Wells

at

Hercules, Inc.
613 West 7th Street
Hattiesburg, Ms

presented to:

Charles Jordan, Environmental Supervisor
Hercules, Inc.
Hattiesburg, MS

July 31, 1997

by

Michael S. Bonner, Ph.D.
BONNER ANALYTICAL TESTING COMPANY

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INTRODUCTION

At the request of the Mississippi Department of Environmental Quality (MDEQ), Hercules, Inc. of Hattiesburg, MS will install, develop, purge and sample six permanent monitoring wells in the following locations shown on the attached B&V - Figure 2.

The MDEQ will be notified 2 weeks prior to commencement of work.

1.0 MONITORING WELL INSTALLATION

Six two inch by twenty foot PVC monitoring wells shall be installed utilizing hollow stem drilling technology. Well depths shall be advanced deeper within the shallow saturated zone if groundwater is not encountered within the first twenty feet.

A screened interval of ten feet having a 0.01" slot shall be used. The screened interval shall extend a minimum of three feet above the groundwater interface. Casing shall be flush thread design.

Filter pack meeting the following specifications shall be tremied into the annulus to a depth of two feet above the screened interval:

Particle Size in Inches	Allowable
>0.039"	35% Max.
<0.039 - ≥0.01	50% Min.
<0.01	0.5% Max.

Following the filter pack, a two foot layer of fine sand (mason) shall be applied via tremie. If the zone is saturated, two feet of 10% hydrated bentonite shall be tremied, followed by 90/10 grout to the surface. An elevation data marker shall be placed in the grout at the surface as a reference point. If the zone is unsaturated, the bentonite seal will be omitted. Hydration time for bentonite shall be a minimum of 8 hours or the manufacturer's recommended hydration time—whichever is greater. Grout shall be allowed to cure for a minimum of 24 hours prior to installation of the surface pad and protective riser equipped with security locks.

Each well shall be equipped with four 3" pipes installed to a depth of 30" at the corners of each pad and grouted in place. Protective pipes shall be filled with grout and painted as specified.

The well casing will be allowed to extend a minimum of 18" above ground surface and shall be equipped with a locking cap, protective casing and a 2'x2'x4" concrete pad. The wells shall be surveyed with longitude and latitude reported along with elevation above sea level ($\pm$ 0.01 ft.).

The following boring/well construction log information will be included where applicable:

- Well identification #
- Date/time of well construction
- Borehole diameter and well casing diameter
- Well depth $\pm$0.01 ft.
- Casing length

- Casing materials
- Casing and screen joint type
- Screened interval(s)
- Screen materials
- Screen slot size/design
- Filter pack material and size
- Calculated and actual filter pack volume
- Filter pack placement method
- Annular sealant composition
- Annular sealant placement method
- Calculated and actual annular sealant volume
- Surface sealant composition
- Surface seal placement method
- Calculated and actual surface sealant volume
- Surface seal design
- Well development procedure
- Turbidity measurement
- Type/design of protective casing
- Well cap and lock
- Ground surface elevation ($\pm$0.01 ft.)

- Survey reference point elevation on well casing (±0.01 ft.)
- Top of monitoring well casing elevation (±0.01)
- Top of protective steel casing elevation (±0.01 ft.)

2.0 WELL DEVELOPMENT

Completed wells will be allowed to cure a minimum of 24 hours prior to development. Prior to well development, water depth will be determined to ±0.01 ft. Following completion, each well shall be developed by pumping and/or bailing, as deemed most appropriate utilizing the surge block technique. The well will be developed until a turbidity of < 5 NTU's is achieved. As a minimum, the well will be allowed to completely recharge prior to purging.

3.0 PURGING

The object of purging shall be to remove five well volumes at a rate similar to the recharge rate in order that turbidity effects are minimized. The following steps shall be used:

1. Establish the water depth and well depth to ±0.01 ft.
2. Remove liquid from the surface and bottom hole to determine whether organic phases exist.
3. Determine pH, temperature, conductivity and turbidity prior to purging the well.
4. Remove five well volumes at a rate of 0.2 to 0.3 liter/min. utilizing a peristaltic pump if groundwater is within 28 feet of surface. Alternately, if groundwater is deeper, purging may be accomplished by means of centrifuged pump, bladder pump or bailer. (Purging by bailer must be done with caution so as not to disturb the well filter pack).

5. After removing 5 well volumes pH, temperature, conductivity and turbidity must be determined twice within 20 minutes. These data points should be ±10% and further, the turbidity must be <5 NTU's. If turbidity is not <5 NTU's, remove additional well volumes as necessary.

In the event the well is purged dry, the following protocol should be followed:

1. Allow the well to recover.
2. If the well has not fully recovered within two hours but has sufficient water for testing then:
    a. Test the well for pH, temperature, conductivity and turbidity.
    b. Test the well again within 20 minutes for the same parameters.
    c. Collect samples as outlined in the sample collection process.
3. If pH, temperature and conductivity are not ±10% and/or turbidity is >5 NTU and if data reflect elevated levels of any pollutant of concern, consider repurging and sampling the well.

4.0 SAMPLING

Sampling should commence as soon as the well recovers but no later than two hours after purging is completed. Samples shall be collected utilizing disposable Teflon bailers. Analytical parameters shall include the attached Compound List of volatile organics (Method 8260).

VOA samples shall be collected in duplicate in 40 ml vials preserved with hydrochloric acid to a pH of <2. VOA samples must contain no air bubbles. Three replicates of samples shall be collected at one designated well for QA/QC analysis.

5.0 ANALYTICAL PROTOCOL

All analyses will conform to the methodologies outlined in EPA/SW846 current edition.

6.0 QA/QC

One equipment blank, one matrix spike (MS) and one matrix spike duplicate (MSD) shall be analyzed for each event. One trip blank for VOA only shall be analyzed for each sampling event.

6.1 TRIP BLANK (VOLATILE)

Trip blank (volatile) duplicate samples shall be prepared in the laboratory utilizing deionized water and bottles from the batches to be used in the field collection and decontamination procedures. The trip blank will be taken in the field and returned to the laboratory in the same environment as the samples.

6.2 EQUIPMENT BLANK (RINSATE BLANK)

Following decontamination of the drilling equipment, carefully transfer about two liters of analyte-free deionized water to a new disposable Teflon bailer. Allow the contents of the bailer to drain over a piece of the decontaminated hollow stem into an analyte-free stainless steel bowl. Transfer the rinsate water to appropriate sample containers. Label and archive the rinsate blank as outlined.

7.0 SAMPLE ARCHIVAL

Following sample collection, affix a completed label to each container. Cover the label with clear tape to protect from moisture. Place the sample bottle in a zip-lock bag and wrap the container in bubble wrap. Write the sample ID number on the outside of the bubble wrap with a permanent marker, then secure the bubble-wrapped container with clear tape.

8.0 DECONTAMINATION AND RESIDUALS MANAGEMENT

Borehole cuttings will be left in place at the well site unless VOA readings indicate gross contamination (>50ppm FID readings). In the event gross contamination is encountered, cuttings will be drummed on site and analyzed for disposal.

Well development, purge and decontamination water will be placed in the Hercules treatment facility for disposal, provided levels do not exceed toxicity characteristics.

The hollow stem, drill rod, and associated tools will be decontaminated before each well is advanced. The procedure shall be as follows:

1. Pressure wash with steam and potable water
2. Brush with phosphate-free detergent to remove any additional debris
3. Pressure wash with steam and potable water
4. Rinse with analyte-free water

9.0 HEALTH AND SAFETY

1. All personnel shall have received 40 hours of OSHA training and shall have current update training.
2. Hercules, Inc. shall provide any additional safety briefings deemed appropriate for the scope of this project.
3. During boring, developing and purging operations, FID readings shall be recorded to ensure that a safe environment is maintained.
4. Elevated (>50 ppm) FID readings shall mandate respiratory protection, cease and desist operations, and re-evaluation by project director, project supervisor, project health and safety officers, and Hercules personnel.
5. Any injuries or potentially unsafe conditions shall be reported immediately to the health and safety officer and then to the project supervisor and project director.

10.0 PERSONNEL

Project Director - Michael S. Bonner, Ph.D.

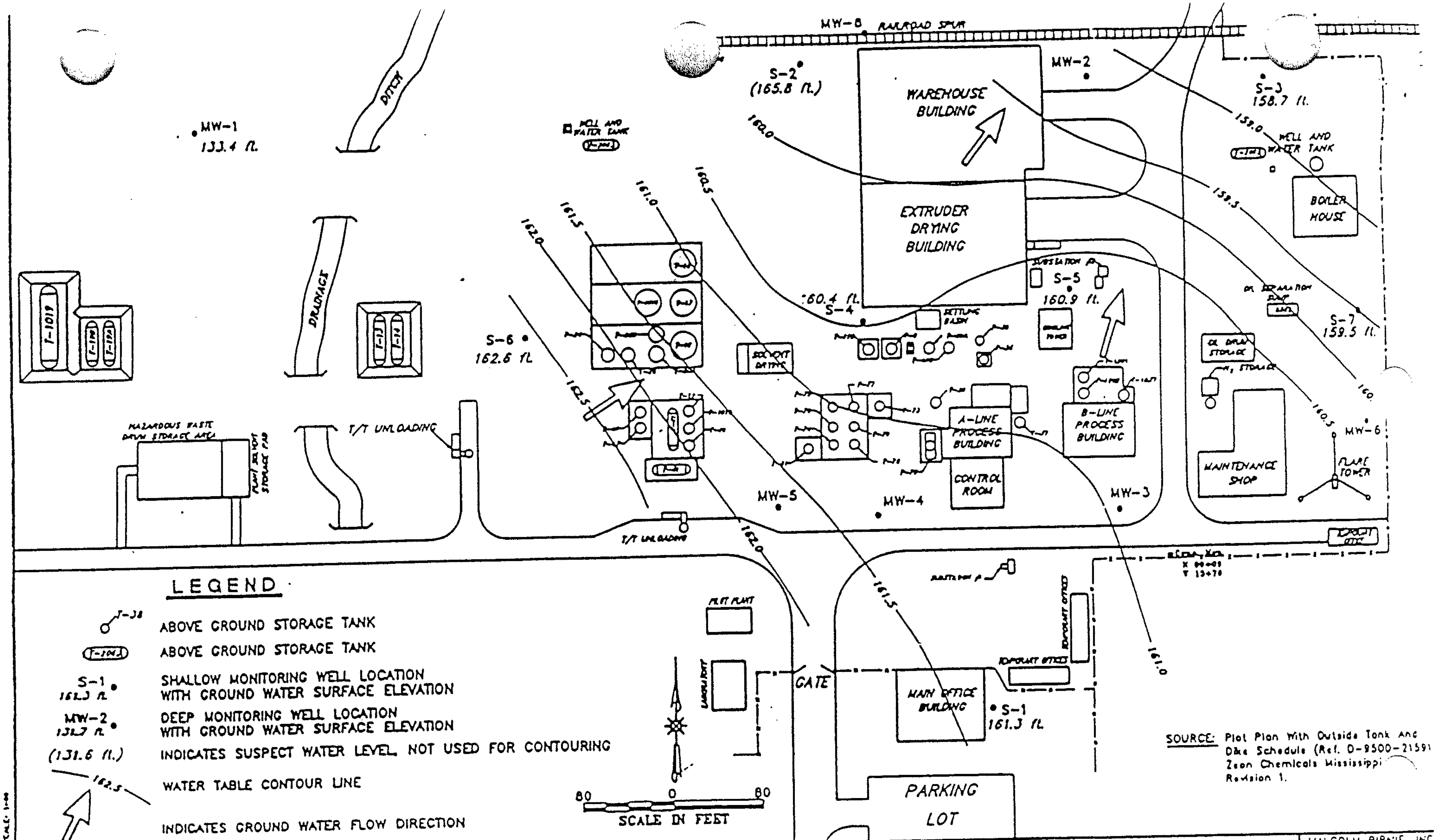
Project Supervisor - David Carter

Health and Safety Officer - Christopher M. Bonner

Hercules, Inc. Contact - Charles Jordan, Environmental Supervisor

11.0 WELL ABANDONMENT

Assuming that the wells are found to be free of analytes of concern, Hercules will have the option of abandoning the wells by then cutting the risers off at ground level and filling the casing with 90/10 grout to surface. Calculated and actual grout used will be recorded to ensure that the wells are properly sealed.



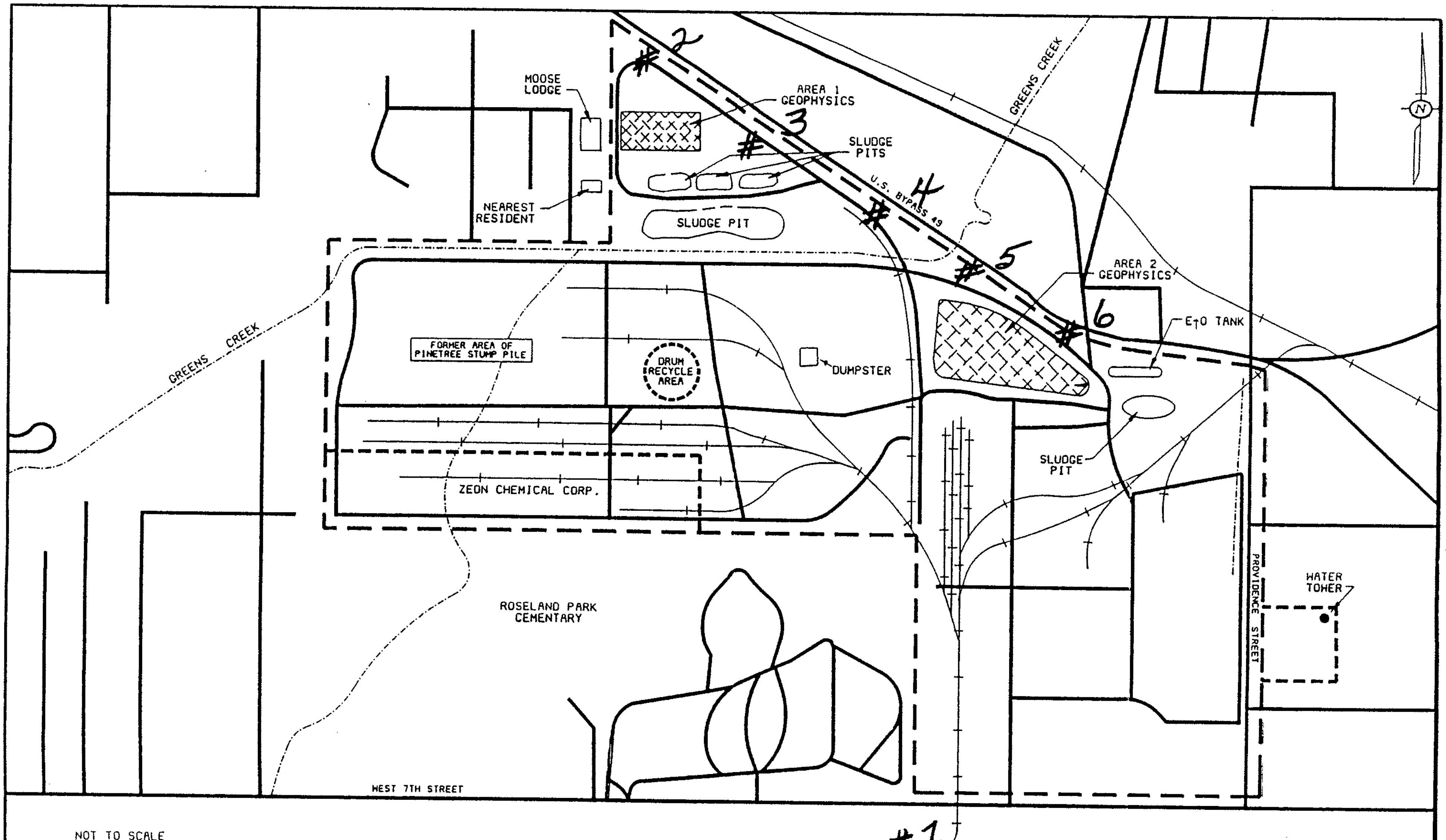
MALCOLM PIRNIE

ZEON CHEMICALS MISSISSIPPI, INC.
HATTIESBURG, MISSISSIPPI

DIRECTION OF GROUND WATER FLOW IN SHALLOW SATURATED ZONE - DECEMBER 1991

MALCOLM PIRNIE, INC

FIGURE 3-3



WASTE SCIENCE AND TECHNOLOGY CORP

SITE LAYOUT MAP

HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE 2

Compound List Report

Method : C:\APPS\HPCHME\1\METHODS\06279701.M
Title : 5-Point Calibration for Method 8260
Last Update : Wed Jul 09 15:00:51 1997
Response via : Initial Calibration
Total Cpnds : 66

PK#		Compound Name	QIon	Exp_RT	Rel_RT	Cal	#Qual	A/H	ID
1	I	Pentafluorobenzene	168	18.84	1.000	A	2	A	B
2	S	Dibromofluoromethane	113	19.33	1.026	A	3	A	B
3	T	Dichlorodifluoromethane	85	4.55	0.242	QO	2	A	B
4	T	Chloromethane	49	5.40	0.287	A	2	A	B
5	T	Vinyl Chloride	62	5.82	0.309	QO	1	A	B
6	T	Bromomethane	94	7.52	0.399	A	1	A	B
7	T	Chloroethane	49	7.90	0.419	A	0	A	B
8	T	Trichlorofluoromethane	101	8.92	0.473	A	1	A	B
9	T	1,1-Dichloroethene	96	11.32	0.601	A	2	A	B
10	T	Methylene Chloride	84	13.17	0.699	QO	1	A	B
11	T	t-1,2-Dichloroethene	96	14.30	0.759	A	2	A	B
12	T	1,1-Dichloroethane	63	15.85	0.841	A	1	A	B
13	T	2,2-Dichloropropane	77	17.85	0.948	A	2	A	B
14	T	c-1,2-Dichloroethene	61	18.03	0.957	A	1	A	B
15	T	Chloroform	83	18.58	0.986	A	1	A	B
16	T	Bromochloromethane	49	19.17	1.017	A	1	A	B
17	T	1,1,1-Trichloroethane	97	19.96	1.060	A	2	A	B
18	I	1,4-Difluorobenzene	114	22.37	1.000	A	1	A	B
19	S	Toluene-d8	98	27.67	1.237	A	1	A	B
20	T	Carbon Tetrachloride	117	20.85	0.932	A	2	A	B
21	T	1,1-Dichloropropene	75	20.50	0.917	A	1	A	B
22	T	Benzene	78	21.45	0.959	A	0	A	B
23	T	1,2-Dichloroethane	62	21.37	0.955	A	0	A	B
24	T	Trichloroethene	95	23.52	1.051	A	1	A	B
25	T	1,2-Dichloropropane	63	24.10	1.078	A	1	A	B
26	T	Bromodichloromethane	83	24.94	1.115	A	1	A	B
27	T	Dibromomethane	93	25.13	1.124	A	2	A	B
28	T	t-1,3-Dichloropropene	75	26.80	1.198	A	1	A	B
29	T	Toluene	92	27.97	1.250	A	1	A	B
30	T	c-1,3-Dichloropropene	75	28.54	1.276	A	1	A	B
31	T	1,1,2-Trichloroethane	83	29.11	1.302	A	2	A	B
32	I	Chlorobenzene-d5	117	33.42	1.000	A	1	A	B
33	T	Tetrachloroethene	166	30.30	0.907	A	2	A	B
34	T	1,3-Dichloropropane	76	30.02	0.898	A	2	A	B
35	T	Dibromochloromethane	129	31.02	0.928	A	1	A	B
36	T	1,2-Dibromoethane	107	31.77	0.951	A	1	A	B
37	T	Chlorobenzene	112	33.30	0.996	A	1	A	B
38	T	1,1,1,2-Tetrachloroethane	131	33.42	1.000	A	1	A	B
39	T	Ethylbenzene	91	33.73	1.009	A	1	A	B
40	T	p,m-Xylene	106	33.73	1.009	A	1	A	B
41	T	o-Xylene	106	35.41	1.060	A	1	A	B
42	T	Styrene	104	35.53	1.063	A	2	A	B
43	T	Bromoform	173	36.87	1.103	A	1	A	B
44	T	Isopropylbenzene	105	36.75	1.100	A	1	A	B

45	T	1,1,2,2-Tetrachloroethane	83	37.40	1.119	A	1	A	B
46	I	1,4-Dichlorobenzene-d4	152	42.40	1.000	A	1	A	B
47	S	4-Bromofluorobenzene	95	37.74	0.890	A	2	A	B
48	T	Bromobenzene	156	38.53	0.909	A	1	A	B
49	T	1,2,3-Trichloropropane	75	37.97	0.895	A	1	A	B
50	T	n-Propylbenzene	91	38.30	0.903	A	1	A	B
51	T	2-Chlorotoluene	91	38.30	0.903	A	1	A	B
52	T	1,3,5-Trimethylbenzene	105	38.92	0.918	A	1	A	B
53	T	4-Chlorotoluene	91	39.02	0.920	A	1	A	B
54	T	t-Butylbenzene	119	40.28	0.950	A	1	A	B
55	T	1,2,4-Trimethylbenzene	105	40.47	0.954	A	1	A	B
56	T	sec-Butylbenzene	105	41.14	0.970	A	1	A	B
57	T	p-Isopropyltoluene	119	41.67	0.983	A	2	A	B
58	T	1,3-Dichlorobenzene	146	42.00	0.991	A	2	A	B
59	T	1,4-Dichlorobenzene	146	42.53	1.003	A	2	A	B
60	T	n-Butylbenzene	91	43.31	1.021	A	1	A	B
61	T	1,2-Dichlorobenzene	146	43.41	1.024	A	2	A	B
62	T	1,2-Dibromo-3-chloropropane	75	46.57	1.098	QO	2	A	B
63	T	1,2,4-Trichlorobenzene	180	50.85	1.199	A	2	A	B
64	T	Hexachlorobutadiene	225	51.47	1.214	A	3	A	B
65	T	Naphthalene	128	52.12	1.229	A	0	A	B
66	T	1,2,3-Trichlorobenzene	180	52.32	1.234	QO	2	A	B

Cal A = Average L = Linear LO = Linear w/origin Q = Quad QO = Quad w/origin
#Qual = number of qualifiers
A/H = Area or Height
ID R = R.T. B = R.T. & Q Q = Qvalue L = Largest A = All
