

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

July 9, 1984

RECEIVED  
JUL 11 1984  
Region III Headquarters

TO: Dan Cummins, Geologist, Lansing District  
FROM: Kathy Sibb, Geologist, Groundwater Permits *KHS*  
SUBJECT: Linden Road Landfill Sampling Results

*Genesee Co.*

Listed below is a synopsis of contaminants or possible contaminants in the wells at Linden Road Landfill. I've also enclosed a copy of the September report they sent, which I've marked to indicate problems, possible problems, and the EPA limits for comparison. I've received the January sampling report, but haven't gone over it in detail. However, many of my general comments apply to it as well as the earlier report.

I've got some real problems with their detection limits. In spite of what we told them earlier, some of the important limits are too high. Specifically:

1. Their cyanide detection limit is twice the EPA recommended level, but under the mandatory level.
2. The arsenic detection limit is at the EPA recommended level, but under the mandatory level.
3. The cadmium, chromium, and selenium detection levels are at the EPA mandatory levels.
4. The lead detection limit is twice the EPA mandatory level.
5. Three of the hydrocarbons have detection limits at 100 ug/l. The rest are at 20 ug/l. Our basic limits are 200 ug/l total hydrocarbons. But some carcinogens or suspect carcinogens which we would not allow to be discharged or which are allowed in only very small quantities aren't being tested for at low enough levels. (For example, TCE limits are 4.5 ug/l, benzene approximately .6 ug/l.)

Detection limits set at or above the EPA mandatory level or even, in some cases, above the recommended level don't allow us to adequately determine the extent of groundwater degradation. Under the circumstances, there could be serious levels of some hydrocarbons in the groundwater, but they will never be detected. Perhaps more importantly, there may be groundwater contamination from moderate amounts of a number of organics

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and inorganics in combination, which also will be undetectable this way. The GM representatives have repeatedly tried to claim that there is no contamination whenever any lab results are below their detection limits.

I investigated selenium toxicity a little in order to help evaluate the test results, since selenium may be leaching from the flyash. I was told that EPA is re-examining its standards. Selenium mineral is not carcinogenic, but some of its compounds are. I don't know what form of selenium is in the discharge. I've also learned that selenium can cause liver toxicity and that long-term ingestion of low amounts can cause a form of sclerosis. It wasn't specified what amounts of selenium could cause these problems.

The following are the summaries for the well sampling:

- Well 1D: 8 ug/l phenol, 48 mg/l sodium, possibly unknown amounts of cadmium, chrome, lead, selenium.
- Well 1S: 535 mg/l total dissolved solids, .14 mg/l nickel, 46 mg/l sodium, possible unknown amounts of cadmium, chrome, lead, and selenium.
- Well 2D: 68 mg/l sodium, possible unknown amounts of cadmium, chrome, lead, selenium.
- Well 2S: 24 ug/l phenol, .01 mg/l cadmium, .1 mg/l lead, 16 mg/l sodium, possible unknown amounts of chrome and selenium.
- Well 3D: 22 ug/l phenol, 40 mg/l sodium, possible unknown amounts of chrome, cadmium, lead, selenium.
- Well 3S: 15 ug/l phenol, 260 mg/l sulfate, .094 mg/l arsenic, .04 mg/l cadmium, .14 mg/l chrome, .1 mg/l lead, .14 mg/l nickel, 42 mg/l sodium, possible unknown amount of selenium.
- Well 4D: .1 mg/l lead, 2.6 ug/l mercury, 32 mg/l sodium, possible unknown amounts cadmium, chrome, selenium.
- Well 5D: .1 mg/l lead, 3.8 ug/l mercury, 46 mg/l sodium, possible unknown amounts cadmium, chrome, selenium.
- Well 6D: 2.6 ug/l mercury, 38 mg/l sodium, possible unknown amounts of cadmium, chrome, lead, and selenium.
- Well 7D: 40 mg/l sodium, possible unknown amounts of cadmium, chrome, lead, selenium.
- Well 8D: 8.7 ug/l mercury, 46 mg/l sodium, possible amounts of cadmium, chrome, lead, selenium.

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Well 9D: 208 mg/l sodium, possible amounts of cadmium, chrome, selenium.

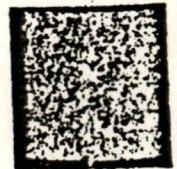
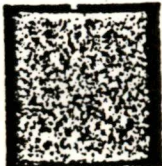
Well 10D: 774 mg/l total dissolved solids, 9 ug/l phenol, 280 mg/l sulfate,  
242 mg/l sodium, possible amounts of cadmium, chrome, selenium.

The wells may also contain amounts of hydrocarbons which are below their  
detection limits.

CHEVROLET CENTRAL LABORATORIES  
 30007 VAN DYKE  
 WARREN, MICH. 48090

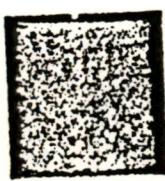
◆◆ MP4035 ◆◆◆ FLINT MFG.  
 ROUND WATER WELL SAMPLES FROM LINDEN RD.  
 SAMPLES SPLIT WITH MICH.DNR. VOLATILE SAMPLES TAKEN.  
 FIRST QUARTERLY SAMPLING.

TEST	9-21-1983 1D	9-21-1983 1S	9-21-1983 2D	9-21-1983 2S	
4 ( )	9.87000	9.44000	10.00000	8.98000	
DS (PPM)	161.00000	<u>535.00000</u>	234.00000	283.00000	Rec. 500 mg/l
IL (PPM) (	5.00000)	-	( 5.00000)	-	not over 5 mg/l
PHEN (PPB) (	<u>8.00000</u>	( 4.00000)	( 4.00000)	<u>24.00000</u>	↙
CB (PPB) (	.10000)	-	( .10000)	-	
03 (PPM) (	.10000)	( .10000)	( .10000)	( .10000)	
L (PPM)	2.00000	-	2.00000	-	
N (PPB) (	20.00000)	( 20.00000)	( 20.00000)	( 20.00000)	10 mg/l rec., 200 mg/l man.
(PPM)	1.80000	.27000	1.30000	.63000	3 mg/l
04 (PPM)	2.00000	200.00000	19.00000	30.00000	250 mg/l rec.
S (PPM) (	.01000)	( .01000)	( .01000)	( .01000)	10 mg/l rec., 50 mg/l man.
A (PPM) (	.05000)	( .05000)	( .05000)	.07900	
D (PPM) (	.01000)?	( .01000)?	( .01000)?	<u>.01000</u>	.01 mg/l man.
A (PPM)	1.92000	12.40000	2.46000	10.60000	
R (PPM) (	.05000)?	( .05000)?	( .05000)?	( .05000)?	.05 mg/l mandatory
U (PPM) (	.02000)	( .02000)	( .02000)	.05000	1 mg/l rec
E (PPM)	.20000	1.30000	.27000	2.12000	
B (PPM) (	.10000)?	( .10000)?	( .10000)?	<u>.10000</u>	.05 mg/l man.
IG (PPM)	1.76000	52.40000	2.84000	<u>44.40000</u>	
G (PPB) (	.40000)	( .40000)	( .40000)	( .40000)	2 ug/l man.
I (PPM) (	.04000)	<u>.14000</u>	( .04000)	.04000	1 mg/l rec.
E (PPM) (	.01000)?	( .01000)?	( .01000)?	( .01000)?	.01 mg/l man.
IG (PPM)	.01000	( .01000)	( .01000)	( .01000)	.05 mg/l man.
RA (PPM)	<u>48.00000</u>	<u>46.00000</u>	<u>68.00000</u>	<u>16.00000</u>	10 mg/l rec.
N (PPM)	.10000	.28000	.17000	.23000	5 mg/l rec.



WEST

	9-21-1983 3D	9-21-1983 3S	9-21-1983 4D	9-21-1983 5D
H ( )	9.67000	8.13000	10.00000	9.81000
PDS (PPM)	309.00000	454.00000	150.00000	207.00000 <i>500 mg/l rec</i>
BIL (PPM)	( 5.00000)	-	( 5.00000)	( 5.00000)
HEN (PPB)	( 22.00000)	( 15.00000)	( 4.00000)	( 4.00000) <i>not over 5 ug/l</i>
PCB (PPB)	( .10000)	-	( .10000)	( .10000)
ND3 (PPM)	( .10000)	( .10000)	( .10000)	( .10000)
CL (PPM)	( 1.00000)	-	( 1.00000)	( 2.50000)
CN (PPB)	( 20.00000)	( 20.00000)	( 20.00000)	( 20.00000) <i>10 ug/l rec, 200 ug/l rec</i>
F (PPM)	1.00000	.37000	2.20000	1.90000 <i>3 ug/l</i>
SD4 (PPM)	31.00000	260.00000	1.00000	35.00000 <i>250 mg/l rec.</i>
AS (PPM)	( .01000)	<u>.09400</u>	( .01000)	( .01000) <i>10 ug/l rec, 50 ug/l rec</i>
BA (PPM)	( .10100)	.35900	( .05000)	.08900
CD (PPM)	( .01000)?	<u>.04000</u>	( .01000)?	( .01000)? <i>.01 mg/l mon</i>
CA (PPM)	( 8.00000)	42.00000	( 1.34000)	4.07000
CR (PPM)	( .05000)?	<u>.14000</u>	( .05000)?	( .05000)? <i>.05 mg/l mon.</i>
CU (PPM)	( .02000)	.10000	( .02000)	( .02000) <i>1 mg/l rec.</i>
FE (PPM)	1.55000	64.00000	.20000	6.40000
PB (PPM)	( .10000)?	<u>.10000</u>	<u>.10000</u>	<u>.10000</u> <i>.05 mg/l mon.</i>
MG (PPM)	44.20000	34.20000	.44400	6.56000
HG (PPB)	.40000	.40000	<u>2.60000</u>	<u>3.80000</u> <i>2 ug/l mon.</i>
NI (PPM)	( .04000)	<u>.14000</u>	( .04000)	( .04000) <i>.1 mg/l rec.</i>
SE (PPM)	( .01000)?	( .01000)?	( .01000)?	( .01000)? <i>.01 mg/l</i>
AG (PPM)	( .01000)	( .01000)	( .01000)	( .01000) <i>.05 mg/l mon.</i>
NA (PPM)	<u>40.00000</u>	<u>42.00000</u>	<u>32.00000</u>	<u>46.00000</u> <i>10 mg/l rec</i>
ZN (PPM)	.28000	.33000	.32000	.20000 <i>5 mg/l rec</i>



TEST	9-21-1983 6D	9-21-1983 7D	9-21-1983 8D	
4 ( )	9.55000	9.80000	9.83000	
OS (PPM)	280.00000	189.00000	208.00000	500 mg/l rec.
IL (PPM) (	5.00000)	5.00000)	5.00000)	
HEN (PPB) (	4.00000)	4.00000)	4.00000)	not over 5 mg/l
OB (PPB) (	.10000)	.10000)	-	
J3 (PPM) (	.10000)	.10000)	.10000)	
(PPM)	6.00000	2.00000	-	
(PPB) (	20.00000)	20.00000)	20.00000)	10 ug/l rec, 200 ug/l mon
(PPM)	.97000	1.70000	1.10000	3 mg/l
04 (PPM)	28.50000	5.00000	12.00000	250 mg/l rec
S (PPM) (	.01000)	.01000)	.01000)	10 ug/l rec, 50 ug/l mon.
A (PPM) (	.05000)	.05600	.06900	
D (PPM) (	.01000)?	.01000)?	.01000)?	.01 mg/l mon
A (PPM)	4.04000	4.00000	3.84000	
R (PPM) (	.05000)?	.05000)?	.05000)?	.05 mg/l mon
U (PPM) (	.02000)	.02000)	.02000)	1 mg/l rec
E (PPM)	.22000	.59000	1.84000	
B (PPM) (	.10000)?	.10000)?	.10000)?	.05 mg/l
G (PPM)	33.60000	14.20000	10.44000	
G (PPB)	<u>2.60000</u>	1.50000	<u>8.70000</u>	2 ug/l mon
I (PPM) (	.04000)	.07000	.04000	.1 mg/l mon
E (PPM) (	.01000)?	.01000)?	.01000)?	.01 mg/l mon
G (PPM) (	.01000)	.01000)	.01000)	.05 mg/l mon
A (PPM)	<u>38.00000</u>	<u>40.00000</u>	<u>46.00000</u>	10 mg/l rec
N (PPM)	.21000	.15000	.25000	5 mg/l rec

PM = MG/L FOR WATER - MG/KG FOR SLUDGE  
 PB = UG/L FOR WATER - UG/KG FOR SLUDGE  
 NOT DETECTED = ( )

ANALYSIS BY   
 I BURL  L CAMILLERI----- S ANDERSON ----- A OLESZKO ----- C KOKKO -----  
 M SULEY----- J. ROELANDT, SUPERVISOR

\*\*\* MP4104 \*\*\* FLINT MFG.  
 GROUNDWATER WELL SAMPLES FROM LINDEN RD. SAMPLES SPLIT WITH MICH DNR.  
 VOLATILE SAMPLES TAKEN.  
 FIRST QUARTERLY SAMPLING.

TEST	10-26-1983 10D	10-26-1983 9D	
PH ( )	10.52000	9.18000	
TDS (PPM)	<u>774.00000</u>	136.00000	500 ug/l rec
OIL (PPM)	-	( 5.00000)	
PHEN (PPB)	<u>9.00000</u>	( 4.00000)	not over 5 ug/l
PCB (PPB)	( .24000)	( .10000)	
NO3 (PPM)	-	( .10000)	
CN (PPB)	( 20.00000)	( 20.00000)	10 ug/l rec, 200 ug/l
F (PPM)	1.90000	.93000	3 ug/l
SO4 (PPM)	<u>260.00000</u>	90.00000	250 ug/l
AS (PPM)	( .01000)	( .01000)	10 ug/l rec, 50 ug/l mon
BA (PPM)	.59700	.14700	
CD (PPM)	( .01000)?	( .01000)?	.01 ug/l mon
CA (PPM)	7.90000	.63000	
CR (PPM)	( .05000)?	( .05000)?	.05 ug/l mon
CU (PPM)	( .02000)	( .02000)	1 ug/l rec
FE (PPM)	.22000	.02000	
PB (PPM)	.01400	( .00500)	.05 ug/l mon
MG (PPM)	.98000	( .01000)	
HG (PPB)	( .40000)	( .40000)	2 ug/l mon
NI (PPM)	( .04000)	( .04000)	.1 ug/l mon
SE (PPM)	( .01000)?	( .01000)?	.01 ug/l mon
AG (PPM)	.01000	( .01000)	.05 ug/l mon
NA (PPM)	<u>242.00000</u>	<u>208.00000</u>	10 ug/l rec
ZN (PPM)	.32000	.11000	5 ug/l rec

PPM = MG/L FOR WATER - MG/KG FOR SLUDGE

PPB = UG/L FOR WATER - UG/KG FOR SLUDGE

NOTE: RESULTS FOR OILS AND SLUDGES ANALYZED BEFORE 9-1-79 ARE ALL MG/KG

NOT DETECTED = ( )