EPA Region 5 Records Ctr.
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June 16, 2003
Project No. 0081300-04

MARCH 2003 GROUNDWATER MONITORING REPORT

Yeoman Creek Landfill Superfund Site
Waukegan, Illinois

Prepared For:

Mr. John Seymour, P.E.
YRCG Project Coordinator
GeoSyntec Consultants
55 W. Wacker Drive, Suite 1100
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AND SCIENTISTS

June 16, 2003
File 0081300-04

Mr. John Seymour, P.E.
YCRG Project Coordinator
GeoSyntec Consultants
55 W. Wacker Drive, Suite 1100
Chicago, IL 60601

Subject: March 2003 Groundwater Monitoring Report
Yeoman Creek Landfill Superfund Site
Waukegan, Illinois

Dear Mr. Seymour:

Weaver Boos Consultants, Inc. (Weaver Boos), sub-consultant to TJ Lambrecht Construction, Inc., has completed the above referenced monitoring for the Yeoman Creek Landfill Superfund Site located in Waukegan, Illinois. The Yeoman Creek Superfund Site (YCS Site) includes Yeoman Creek Landfill, Edwards Field Landfill, and Rubloff Landfill.

Content and formatting of this report is based on previous reports prepared by Parsons Engineering Science, Inc. and the June 5, 2002 email correspondence from Mr. John Seymour to Amy Powers of Weaver Boos.

March 2003 Monitoring Event

Weaver Boos was present at the YCS Site to conduct the necessary fieldwork to collect field parameters for groundwater and leachate samples and groundwater level measurements from March 17, 2003 to March 20, 2003. The subject monitoring event included a total of 74 monitoring locations as follows: 43 groundwater wells, 3 leachate wells, and 28 landfill gas probes (see **Figure 1**). A summary of the March 2003 Monitoring Event is provided as **Table 1**. Pursuant to United States Environmental Protection Agency (USEPA) Correspondence dated May 30, 2002, only field parameters and groundwater elevation measurements were obtained during this event. Groundwater elevation measurements were collected from each of the 74

monitoring locations with the exception of four landfill gas probes. Landfill gas probes LFG-105 and LFG 110 were not located, LFG-106 is damaged, and LFG-223 was frozen at the time a depth to water level was to be collected. Field parameters were collected from 43 groundwater wells and 3 leachate wells.

Field work was performed in accordance with the site specific Field Sampling Plan (FSP) prepared by GeoSyntec Consultants, dated August 2001, and the Pre-Design Data Collection Activities Quality Assurance Project Plan (QAPjP) prepared by Parsons Engineering Sciences, Inc. dated August 1999.

A representative from R.F. Weston was present on-site to oversee sampling activities on behalf of the USEPA.

Groundwater and Leachate Sampling

Depth to groundwater measurements were taken over a two-day period at the beginning of the sampling event, prior to purging any of the wells so as to obtain measurements that would provide an accurate representation of the groundwater and leachate flow in the vicinity of the site (see **Table 2**).

The wells were purged with dedicated tubing and a peristaltic pump using a low-flow technique. A flow through cell was used to measure pH, temperature, conductivity, dissolved oxygen, and oxidation-reduction potential. Turbidity was measured using a separate turbidity meter. A colorimeter and mixing agents were used to field test for ferrous iron in accordance with the FSP. The field measurements collected from each well and are included on **Table 3**.

Field parameters were collected from 22 Shallow Zone monitoring wells, 20 Lower Outwash monitoring wells, 1 bedrock well, and 3 leachate monitoring wells (See **Table 1**). Field parameters were analyzed for field pH, specific conductivity, dissolved oxygen, ferrous iron, temperature, turbidity, and oxidation-reduction potential.

Potentiometric Surface Maps

The depth to groundwater data from the wells screened within the lower outwash was used to generate a groundwater potentiometric surface map. As shown on **Figure 2**, groundwater flow for the lower outwash is towards the east. The depth to groundwater data from the leachate wells and the landfill gas probes was used to create **Figure 3** (Potentiometric Surface Map for Leachate

Wells). The leachate contours at Edwards Field show a leachate gradient extending to the west and northwest. Note that numerous landfill gas probes were dry in March 2003, which are likely a result of seasonal fluctuation.

We trust that this information is sufficient for your needs at this time. If you have any questions, comments, or suggestions regarding the data presented in this groundwater report, please contact us at your convenience.

Very truly yours,

Weaver Boos Consultants, Inc.

Amy M. Powers
Project Geologist

Michael B. Maxwell, LPG
Project Manager

Attachments: Tables
Figures

TABLES

Tables

Table 1
Summary of March 2003 Quarterly Monitoring
Yeoman Creek Landfill
Waukegan, Illinois

Sample Description	Water Levels	Field Parameters
Groundwater Monitoring Wells		
MW-301	X	X
MW-G	X	X
MW-B	X	X
MW-105	X	X
MW-106	X	X
MW-107	X	X
MW-108	X	X
MW-101	X	X
MW-102	X	X
MW-109	X	X
MW-110	X	X
MW-111	X	X
MW-A	X	X
MW-103	X	X
MW-104	X	X
MW-112	X	X
MW-217	X	X
MW-210	X	X
MW-209	X	X
MW-216	X	X
MW-E1	X	X
MW-E2	X	X
MW-C	X	X
MW-D	X	X
MW-211	X	X
MW-212	X	X
MW-215	X	X
MW-213	X	X
MW-214	X	X
MW-201	X	X
MW-202	X	X
MW-203	X	X
MW-204	X	X
MW-205	X	X
MW-206	X	X
MW-207	X	X
MW-208	X	X
MW-401	X	X
MW-402	X	X
MW-403 - Bedrock	X	X
MW-405	X	X
MW-406	X	X
MW-F	X	X

Table 1
Summary of March 2003 Quarterly Monitoring
Yeoman Creek Landfill
Waukegan, Illinois

Sample Description	Water Levels	Field Parameters
Leachate Monitoring Wells		
LW-101	X	X
LW-102	X	X
LW-103	X	X
Landfill Gas Probes		
LFG-101	X	
LFG-102	X	
LFG-103	X	
LFG-104	X	
LFG-105	X	
LFG-106	X	
LFG-107	X	
LFG-108	X	
LFG-109	X	
LFG-110	X	
LFG-111	X	
LFG-201	X	
LFG-202	X	
LFG-203	X	
LFG-204	X	
LFG-205	X	
LFG-206	X	
LFG-207	X	
LFG-208	X	
LFG-211	X	
LFG-216	X	
LFG-218	X	
LFG-219	X	
LFG-220	X	
LFG-221	X	
LFG-222	X	
LFG-223	X	
LFG-224	X	

Table 2
Summary of Groundwater Elevations
March 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Location ID	Top of PVC* (MSL)	Total Well Depth* (feet)	Depth to Water 3-03 (feet)	Groundwater Elevation 3-03 (MSL)
Shallow Zone Wells				
Lacustrine Clays, Organics, Sand Lenses				
MW-204	662.45	22.67	18.70	643.75
MW-206	663.75	21.83	10.76	652.99
MW-208	659.31	21.31	11.97	647.34
MW-402	657.25	20.28	5.29	651.96
Fluviolacustrine Sands				
MW-102	653.53	23.77	8.47	645.06
MW-104	652.53	25.30	7.42	645.11
MW-106	654.96	20.26	8.38	646.58
MW-107	656.46	21.59	11.04	645.42
MW-108	654.59	25.22	9.58	645.01
MW-110	653.18	25.25	8.21	644.97
MW-111	655.64	25.27	10.18	645.46
MW-202	660.01	27.82	10.78	649.23
MW-210	651.81	26.15	6.26	645.55
MW-211	658.81	41.93	13.74	645.07
MW-212	658.87	18.79	13.87	645.00
MW-214	653.54	24.29	6.55	646.99
MW-215	654.80	20.27	5.16	649.64
MW-216	657.47	24.77	12.56	644.91
Upper Outwash				
MW-217	651.68	17.84	5.77	645.91
MW-406	661.19	32.91	19.55	641.64
MW-E1	664.75	33.81	23.01	641.74
MW-G	664.96	24.63	8.09	656.87

Note: Top of PVC Elevations for groundwater wells provided by Parsons Engineering Sciences, Inc. except for wells MW-112 and MW-217 which were installed and surveyed by Weaver Boos Consultants, Inc.
Water level measurements obtained on March 17 and 18, 2003.

Table 2
Summary of Groundwater Elevations
March 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Location ID	Top of PVC* (MSL)	Total Well Depth* (feet)	Depth to Water 3-03 (feet)	Groundwater Elevation 3-03 (MSL)
Lower Outwash Wells				
MW-101	653.63	40.25	8.63	645.00
MW-103	652.19	50.28	7.21	644.98
MW-105	654.79	45.37	9.24	645.55
MW-109	653.49	64.59	10.48	643.01
MW-112	649.45	39.87	4.58	644.87
MW-201	659.80	57.36	15.02	644.78
MW-203	663.00	68.51	22.00	641.00
MW-205	664.13	74.55	21.43	642.70
MW-207	658.50	47.02	16.26	642.24
MW-209	651.75	46.91	6.90	644.85
MW-213	653.89	47.11	9.03	644.86
MW-301	678.74	45.36	22.07	656.67
MW-401	657.53	60.77	15.82	641.71
MW-405	661.82	62.94	20.25	641.57
MW-A	655.54	50.18	10.03	645.51
MW-B	654.49	58.74	9.16	645.33
MW-C	655.31	49.51	12.31	643.00
MW-D	655.33	36.96	10.30	645.03
MW-E2	664.71	53.92	22.80	641.91
MW-F	660.30	43.27	18.79	641.51
Bedrock Well				
MW-403	657.63	174.75	83.88	573.75
Leachate Wells				
LW-101	655.70	15.09	10.31	645.39
LW-102	656.94	13.31	10.31	646.63
LW-103	654.93	15.11	7.57	647.36

Note: Top of PVC Elevations for groundwater wells provided by Parsons Engineering Sciences, Inc. except for wells MW-112 and MW-217 which were installed and surveyed by Weaver Boos Consultants, Inc.
Water level measurements obtained on March 17 and 18, 2003.

Table 2
Summary of Groundwater Elevations
March 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Location ID	Top of PVC* (MSL)	Total Well Depth* (feet)	Depth to Water 3-03 (feet)	Groundwater Elevation 3-03 (MSL)
Landfill Gas Probes				
LFG-101	652.77	10.03	9.02	643.75
LFG-102	654.01	10.13	8.39	645.62
LFG-103	655.37	10.13	DRY	<645.24
LFG-104	654.23	10.15	DRY	<644.08
LFG-105	654.55	8.85	---	---
LFG-106	653.93	9.06	DAMAGED	---
LFG-107	652.64	5.54	DRY	<647.10
LFG-108	654.44	9.24	DRY	<645.20
LFG-109	652.39	7.68	7.05	645.34
LFG-110	652.19	9.92	---	---
LFG-111	654.01	10.22	DRY	<643.79
LFG-201	660.68	8.24	DRY	<652.44
LFG-202	662.33	9.98	5.68	656.65
LFG-203	663.76	10.06	DRY	<653.70
LFG-204	658.34	10.33	8.66	649.68
LFG-205	656.72	10.28	9.18	647.54
LFG-206	659.46	10.35	DRY	<649.11
LFG-207	657.02	10.32	DRY	<646.70
LFG-208	657.80	10.12	DRY	<647.68
LFG-211	660.81	7.48	6.77	654.04
LFG-216	656.62	10.20	7.04	649.58
LFG-218	662.19	6.73	DRY	<655.46
LFG-219	661.83	10.10	9.47	652.36
LFG-220	660.32	10.16	DRY	<650.16
LFG-221	660.04	10.21	DRY	<649.83
LFG-222	663.38	7.87	DRY	<655.51
LFG-223	660.83	9.82	FROZEN	---
LFG-224	665.28	9.97	DRY	<655.31

Note: Top of PVC Elevations for groundwater wells provided by Parsons Engineering Sciences, Inc. except for wells MW-112 and MW-217 which were installed and surveyed by Weaver Boos Consultants, Inc.
Water level measurements obtained on March 17 and 18, 2003.

Table 3
Summary of Analytical Results
March 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Parameter Name	Units	35 IAC 620.410 Class I Standard	Federal MCL	MW-101	MW-102	MW-103	MW-104	MW-105	MW-106	MW-107	MW-108	MW-109	MW-110	MW-111	MW-112	MW-201	MW-202	MW-203	MW-204
				LO	SZ	LO	SZ	LO	SZ	SZ	SZ	LO	SZ	SZ	LO	LO	SZ	LO	SZ
Field Parameters																			
Dissolved Oxygen	mg/L	NA	NA	0.19	2.70	0.28	0.00	0.73	0.75	0.16	0.05	2.58	0.27	1.45	0.00	3.95	0.00	1.85	1.07
Ferrous Iron	ppm	NA	NA	0.83	11.12	0.44	15.36	2.93	48.00	3.02	0.63	2.70	12.96	13.92	4.41	1.73	13.68	0.24	0.65
pH	s.u.	6.5-9.0	NA	7.10	7.04	7.36	6.96	7.09	9.07	7.39	7.70	7.73	7.03	6.98	7.29	7.43	6.90	8.03	7.03
Redox Potential	mV	NA	NA	-81	-98	-68	-110	-92	-84	-103	-27	-97	-89	-84	-106	-69	-120.0	-34	-85
Specific Conductivity	umhos	NA	NA	2300	2320	2050	3670	1810	2730	832	877	1940	2430	2450	2180	2540	7320	602	896
Temperature	deg. C	NA	NA	9.52	8.73	7.98	10.03	10.33	9.07	9.22	8.43	9.91	8.63	8.27	7.69	10.83	10.45	13.56	12.87
Turbidity	ntu	NA	NA	5.80	42.40	9.90	13.90	5.70	2.76	7.60	5.00	23.00	58.00	6.90	2.40	4.60	4.60	5.20	3.68

Parameter Name	Units	35 IAC 620.410 Class I Standard	Federal MCL	MW-205	MW-206	MW-207	MW-208	MW-209	MW-210	MW-211	MW-212	MW-213	MW-214	MW-215	MW-216	MW-217	MW-301	MW-401	MW-402
				LO	SZ	LO	SZ	LO	SZ	SZ	SZ	LO	SZ	SZ	SZ	SZ	LO	LO	SZ
Field Parameters																			
Dissolved Oxygen	mg/L	NA	NA	2.87	0.00	1.39	1.18	0.26	0.00	3.61	2.93	2.11	2.26	0.00	0.00	0.31	1.86	0.69	1.05
Ferrous Iron	ppm	NA	NA	0.20	12.45	7.48	10.40	11.92	9.70	2.01	38.24	1.18	1.35	19.36	15.08	1.74	1.29	4.56	3.49
pH	s.u.	6.5-9.0	NA	7.23	6.97	6.80	6.90	7.05	6.93	6.97	6.77	7.31	7.19	6.71	6.55	7.37	7.56	7.01	7.01
Redox Potential	mV	NA	NA	-115	-135	-80	-90	-103	-95	-69	-95	-43	-127	-111	-88	-36	-43	-95	-87
Specific Conductivity	umhos	NA	NA	2030	4020	2330	1430	1870	2260	1950	1600	2240	1810	848	1910	1450	624	1980	2540
Temperature	deg. C	NA	NA	11.28	11.86	10.91	9.32	10.28	10.56	11.93	11.36	10.85	10.40	9.28	9.80	7.65	11.54	11.75	10.69
Turbidity	ntu	NA	NA	97.60	8.59	5.96	29.70	3.20	3.90	9.20	8.10	9.34	6.33	9.40	32.80	24.80	13.70	8.30	7.20

Parameter Name	Units	35 IAC 620.410 Class I Standard	Federal MCL	MW-403	MW-405	MW-406	MW-A	MW-B	MW-C	MW-D	MW-E1	MW-E2	MW-F	MW-G	LW-101	LW-102	LW-103
				BR	LO	SZ	LO	LO	LO	LO	SZ	LO	LO	SZ	LE	LE	LE
Field Parameters																	
Dissolved Oxygen	mg/L	NA	NA	NS	0.44	0.79	5.57	1.85	3.53	1.26	1.07	2.01	1.01	0.85	0.91	0.92	0.00
Ferrous Iron	ppm	NA	NA	0.22	39.92	0.27	0.40	0.97	7.08	2.93	0.53	4.19	3.03	6.16	13.12	22.24	11.76
pH	s.u.	6.5-9.0	NA	6.74	6.84	7.25	7.69	7.50	7.51	7.02	7.67	6.96	6.97	7.51	6.86	6.84	6.75
Redox Potential	mV	NA	NA	NS	-79	25	-55	-79	-99	-89	-40	-72	14	-34	-123	-114	-115
Specific Conductivity	umhos	NA	NA	586	2800	2120	1200	644	1010	2810	1270	2770	4470	662	2230	3170	3540
Temperature	deg. C	NA	NA	12.65	12.51	11.65	11.30	12.97	13.91	14.31	13.21	13.39	10.93	11.33	8.79	7.48	7.26
Turbidity	ntu	NA	NA	16.00	13.60	5.90	5.10	16.70	99.90	17.50	17.30	99.90	94.60	98.40	74.20	42.20	25.60

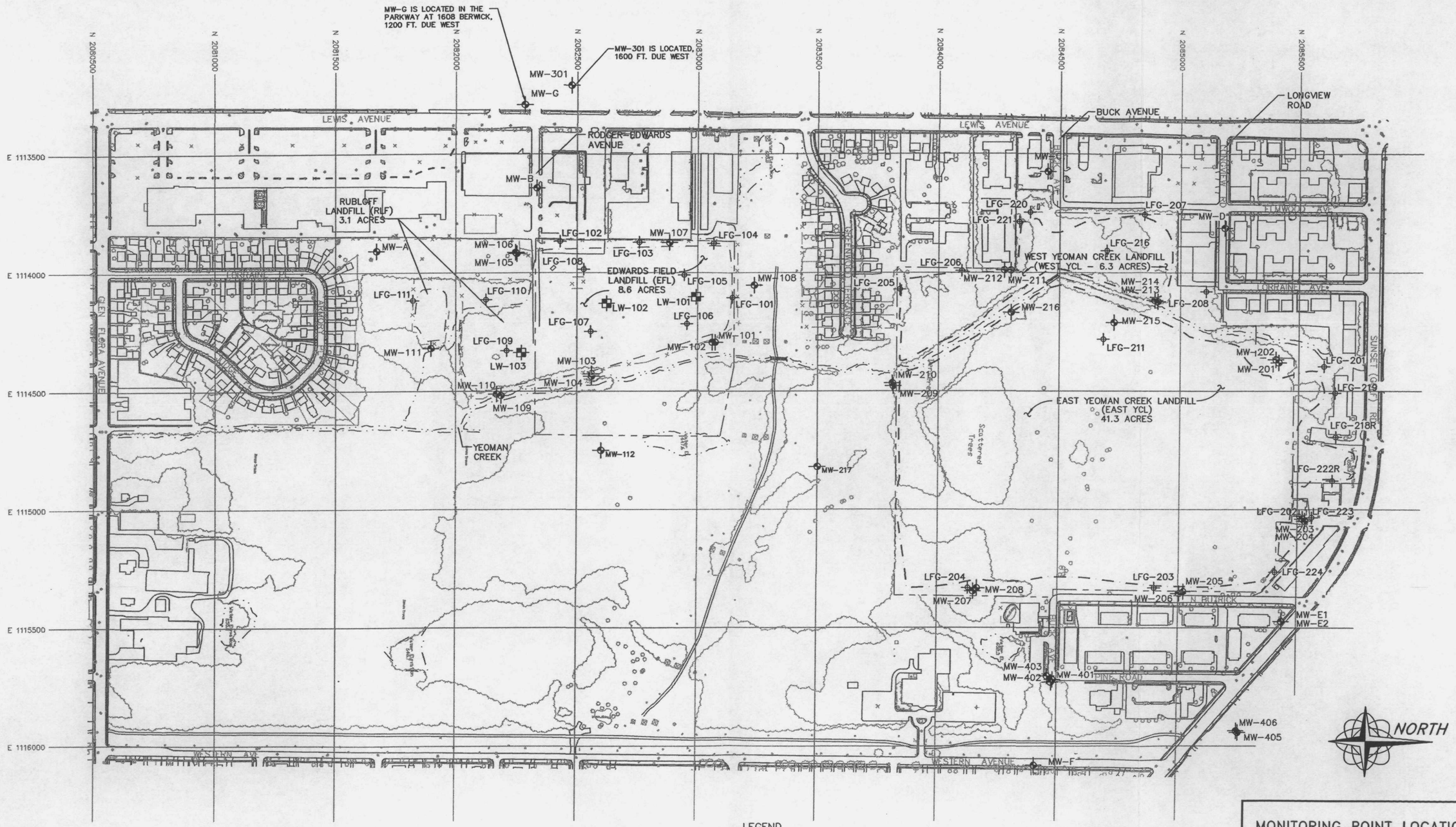
Notes:

Exceedance of 35 IAC 620.410 Class I Standards indicated by *0.43*

NA - Not Applicable
NS - Not Sampled
BR - Bedrock
LE - Leachate
LO - Lower Outwash
SZ - Shallow Zone

FIGURES

Figures



LEGEND

APPROXIMATE LIMIT OF WASTE	TREE LINE
APPROXIMATE PROPERTY LINE	EXISTING ROAD
MW-201 GROUNDWATER MONITORING WELL	EXISTING TREE
LW-201 LEACHATE WELL	HOUSE OR STRUCTURE
LFG99-8 GAS PROBE	SIDEWALK
SURFACE WATER	EXISTING FENCE

SCALE

0 200' 400' 800'

NOTE: LEACHATE WELL LW-201, LW-202, LW-203, AND LW-204 WERE DECOMMISSIONED PRIOR TO THE JUNE 2002 EVENT.

NOTE: DRAWING ADAPTED FROM DRAWING NO. 2 OF 29 FROM GEOSYNTEC CONSULTANTS, JOB No. 000864-8.4, DATED APRIL 27, 2001 (REMEDIAL DESIGN, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS).

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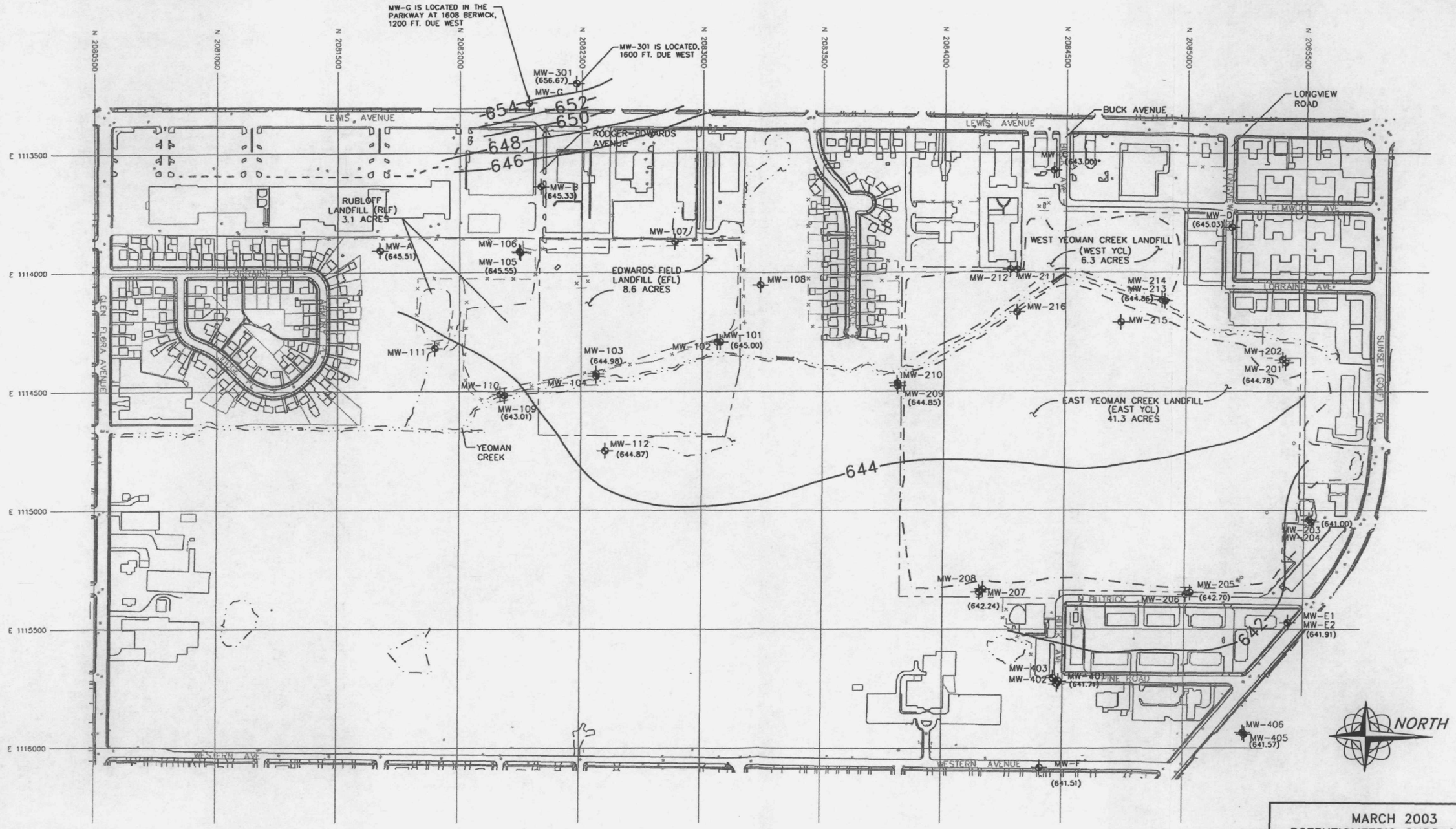
MONITORING POINT LOCATIONS

YEOMEN CREEK LANDFILL
WAUKEGAN, ILLINOIS

Weaver Boos & Gordon, Inc.

GRIFFITH, IN ALBUQUERQUE, NM | CHICAGO, IL (312) 922-1030 | GLEN ELLYN, IL SPRINGFIELD, IL

DRAWN BY: REK	DATE: 08/15/02	FILE: 0081300-04
REVIEWED BY: AP	CAD:LOCATIONS.DWG	FIGURE 1



LEGEND

- APPROXIMATE LIMIT OF WASTE
- APPROXIMATE PROPERTY LINE
- MW-201 GROUNDWATER MONITORING WELL
- TREE LINE
- EXISTING ROAD
- EXISTING TREE
- HOUSE OR STRUCTURE
- SIDEWALK
- EXISTING FENCE

SCALE

0 200' 400' 800'

NOTE: DRAWING ADAPTED FROM DRAWING NO. 2 OF 29 FROM GEOSYNTEC CONSULTANTS, JOB No. 000864-8.4, DATED APRIL 27, 2001 (REMEDIAL DESIGN, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS).

* GROUNDWATER ELEVATION FOR MW-C APPEARS TO BE ANOMALOUSLY LOW IN RELATION TO SURROUNDING DATA, THEREFORE IT WAS NOT UTILIZED WHEN CREATING THIS POTENTIOMETRIC SURFACE MAP.

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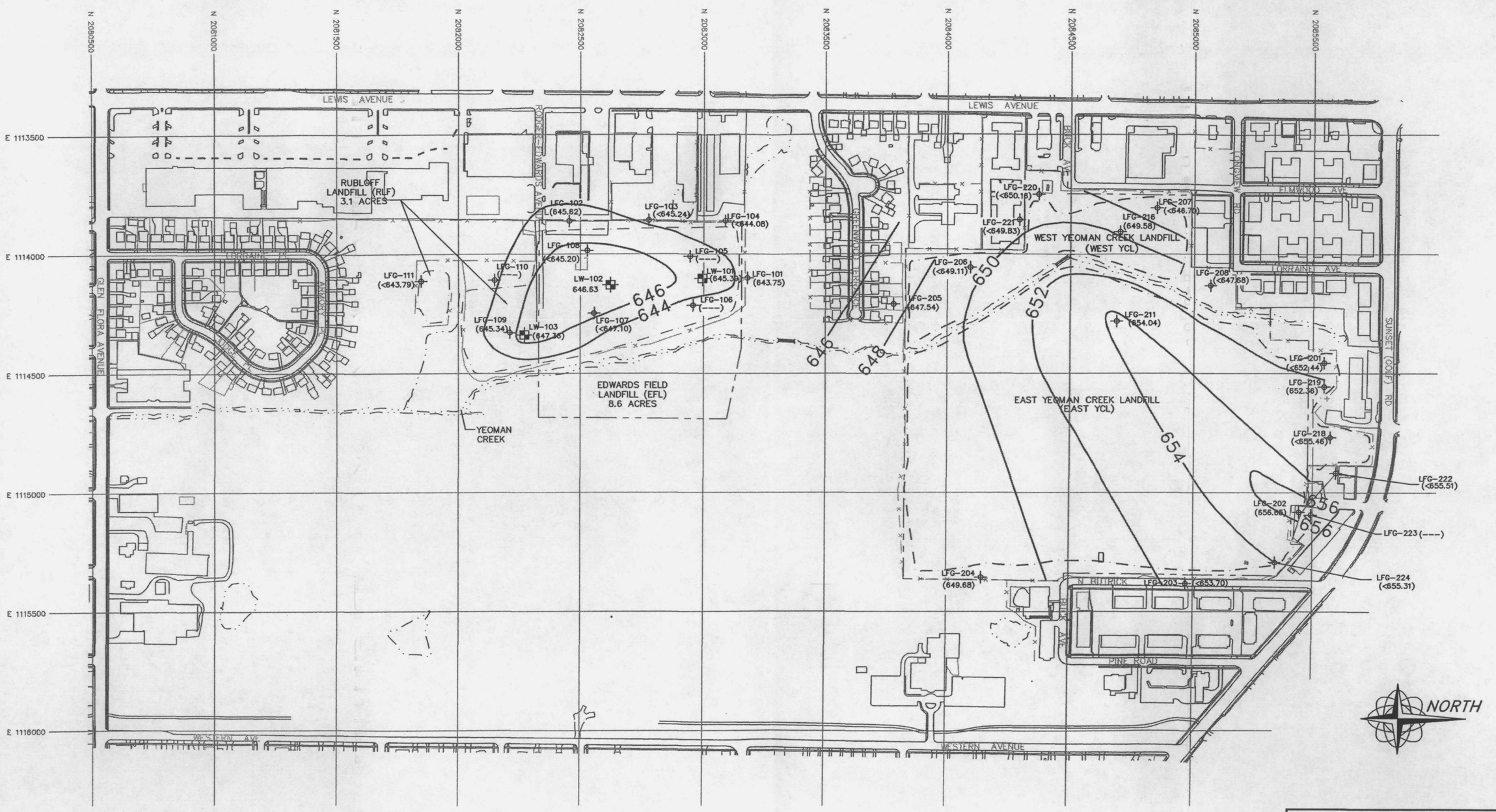
MARCH 2003 POTENTIOMETRIC SURFACE MAP FOR LOWER OUTWASH WELLS

YEOMEN CREEK LANDFILL
WAUKEGAN, ILLINOIS

Weaver Boos Consultants, Inc.
GRIFFITH, IN / FORT WORTH, TX — CHICAGO, IL (312) 922-1030 — DOWNERS GROVE, IL / SPRINGFIELD, IL

DRAWN BY: CB	DATE: 03-09-03	FILE: 0081300-04
REVIEWED BY: RB	CAD:0303POT.DWG	FIGURE 2



NOTES

1.) LEACHATE WELL LW-201, LW-202, LW-203, AND LW-204 WERE DECOMMISSIONED PRIOR TO THE JUNE 2002 EVENT.

2.) DRAWING ADAPTED FROM DRAWING NO. 2 OF 29 FROM GEOSYNTEC CONSULTANTS, JOB No. 000864-8.4, DATED APRIL 27, 2001 (REMEDIAL DESIGN, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS).

3.) DRY WELLS ARE SHOWN WITH ELEVATIONS < THE BOTTOM OF THE WELL.

4.) UNABLE TO OBTAIN LEACHATE LEVEL FROM LFG-106 AS THIS GAS PROBE HAS BEEN DAMAGED.

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LEGEND

650 — EXISTING GROUND ELEVATION
APPROXIMATE LIMIT OF WASTE
APPROXIMATE PROPERTY LINE
646 — LEACHATE CONTOUR (DASHED WHERE INFERRED)
LW-201 — LEACHATE WELL
LFG-109 — GAS PROBE
EXISTING ROAD
HOUSE OR STRUCTURE
SIDEWALK
EXISTING FENCE

SCALE
0 200' 400' 800'

MARCH 2003
POTENTIOMETRIC SURFACE MAP
FOR LEACHATE WELLS

YEOMEN CREEK LANDFILL
WAUKEGAN, ILLINOIS

Weaver Boos Consultants, Inc.
GRIFFITH, IN FORT WORTH, TX | CHICAGO, IL (312) 922-1030 | DOWNERS GROVE, IL SPRINGFIELD, IL

DRAWN BY: CB	DATE: 03-09-03	FILE: 0081300-04
REVIEWED BY: RB	CAD:0303LEACHATE.DWG	FIGURE 3