







 Butler Landfill boundary

Landfill Boring Locations

-  Monitoring Well (depth to trash)
-  Monitoring Well (no trash found)
-  Soil Boring (depth to trash)
-  Soil Boring (no trash found)

MW-6 (0.5)

MW-5

MW-4

MW-7 (5)

MW-3 (2)

B-2 (5)

B-5

B-23

B-24 (5.5)

B-2

B-25 (2.75)

B-32

MW-2

B-26

B-1

B-15 (5)

MW-1 (7)

B-11

B-8 (4)

B-12 (5.5)

B-6

B-7 (5.5)

B-16 (4.5)

B-10 (4.5)

B-9

Wetland Pond

MATURE CENTER DR

N MOPAC EXPY SB

N MOPAC EXPY NB

MOPAC TO 5TH/CC RMP

S MOPAC EXPY SB

S MOPAC EXPY NB

STRATFORD DR

STEPHEN F AUSTIN DR

BARTON SPRINGS RD

LOU NEFF RD

SUMMARY OF SOIL BORINGS AT BUTLER LANDFILL IN ZILKER PARK (AUSTIN, TEXAS)

Boring Number	Year Drilled	Surface Elev (ft)	Top Trash Elev (ft)	Btm Trash Elev (ft)	Total Hole Depth (ft)	Cover Depth (ft)	Layer 1 Soil Type	Layer 1 Soil Depth (ft)	Layer 2 Soil Type	Layer 2 Soil Depth (ft)	Layer 3 Soil Type	Layer 3 Soil Depth (ft)	Layer 4 Soil Type	Layer 4 Soil Depth (ft)
MW-1	1984	451	444	432	26.00	7.00	clay	4.00	sand	3.00	trash/refuse	12.00	sand	4.00
MW-2	1998	465.74	none	none	39.00	n/a	clay loam	5.00	sand	7.00	sandy clay loam	10.00	sand	17.00
MW-3	1998	457.66	455.66	453.66	47.50	2.00	cover soil	2.00	trash/refuse	2.00	clay loam	7.00	sand content	29.00
MW-4	1998	464.09	none	none	33.00	n/a	clay loam	33.00						
MW-5	1998	457.04	none	none	38.00	n/a	cover soil	2.00	gravely clay	12.00	clayey sand (SC)	4.00	sand	2.00
MW-6	1998	454.24	453.74	444.24	39.00	0.50	cover soil	0.50	trash/refuse	9.50	clay	14.00	sand	15.00
MW-7	1998	455.10	450.10	442.60	34.50	5.00	clay loam	5.00	trash/refuse	7.50	sand	2.50	clay loam	2.00
B-1	2017	469	none	none	6.00	n/a	silty lean clay (CL-ML)	6.00						
B-2	2017	469	none	none	5.50	n/a	silty lean clay (CL-ML)	3.00	limestone	2.50				
B-3	2017	468	none	none	5.00	n/a	silty lean clay (CL-ML)	3.00	limestone	2.00				
B-4	2017	463	none	none	3.50	n/a	silty lean clay (CL-ML)	2.25	limestone	1.25				
B-5	2017	462	none	none	6.00	n/a	silty lean clay (CL-ML)	6.00						
B-6	2017	464	none	none	6.00	n/a	silty lean clay (CL-ML)	6.00						
B-7	2017	462	456.5	< 456	6.00	5.50	silty lean clay (CL-ML)	5.50	trash/refuse	0.50				
B-8	2017	459	455	<456	5.00	4.00	silty lean clay (CL-ML)	4.00	trash/refuse	1.00				
B-9	2017	459	none	none	6.00	n/a	silty lean clay (CL-ML)	6.00						
B-10	2017	457	453.5	< 452.5	4.50	3.50	silty lean clay (CL-ML)	1.50	clayey sand (SC)	2.00	trash/refuse	1.00		
B-11	2017	454	none	none	6.00	n/a	silty lean clay (CL-ML)	6.00						
B-12	2017	457	451.5	< 451	6.00	5.50	silt (ML)	5.50	trash/refuse	0.50				
B-15	2017	451	445	<444	6.00	5.00	silt (ML)	5.00	trash/refuse	1.00				
B-16	2017	456	451	< 450.5	5.00	1.50	silty lean clay (CL-ML)	1.50	poorly graded sand (SP)	2.50	poorly graded gravel (GP)	0.50	trash/refuse	0.50
B-22	2017	461	455.5	< 455	5.50	4.75	crushed stone	0.25	silty lean clay (CL-ML)	4.75	trash/refuse	0.50		
B-23	2017	462	none	none	5.00	n/a	crushed stone	0.25	silty lean clay (CL-ML)	3.75	limestone	1.00		
B-24	2017	464	458	< 457.5	6.00	2.25	crushed stone	0.25	silty lean clay (CL-ML)	2.25	poorly graded sand (SP)	3.00	trash/refuse	0.50
B-25	2017	466	460.5	< 457.75	5.50	2.50	crushed stone	0.25	silty lean clay (CL-ML)	2.50	trash/refuse	2.75		
B-26	2017	468	none	none	6.00	n/a	crushed stone	0.25	silty clay (CL-ML)	5.25	limestone	0.50		
B-32	2017	467	none	none	6.00	n/a	crushed stone	0.25	silty clay (CL-ML)	5.25	limestone	0.50		

TXDOT conducted borings prior to constructing the MoPac Bridge but legible documents allowing analysis of these borings have not yet been located.

One boring for a monitoring well was completed by Underground Resource Management, Inc. (URM) on 24 Feb 1984.

Boring MW-1 encountered groundwater at a depth of 9 feet (on 02 May 1998, the groundwater depth was measured as 10.6 feet by EMCOM).

Six borings for monitoring wells were completed by EMCOM on 16-19 Mar 1998.

Boring MW-4 was drilled on 16 Mar 1998. On 02 May 1998, the depth to groundwater was 31.85 feet.

Borings MW-6 and MW-7 were drilled on 17 Mar 1998. On 02 May 1978, the depth to groundwater was 25.15 and 26.63 feet, respectively.

Borings MW-2, MW-3, and MW-5 were drilled on 19 Mar 1998. On 02 May 1978, the depth to groundwater was 34.71 ft, 26.73, and 26.20 feet, respectively.

Twenty borings were drilled and samples by HVJ Associates on 09 Mar 2017.

The 2017 borings by HVJ Associates were drilled to a maximum depth of 6' unless trash was encountered first.

Borings B-13, B-14, B-17, B-18, B-19, B-20, B-21, B-27, B-28, B-29, B-30, and B-31 were authorized but never performed.

Boring B-15 encountered groundwater at a depth of 3.5 feet.

Boring B-23 had detectable levels of methane.

Of the 27 borings drilled, trash was encountered in 13 of them (MW-1, MW-6, MW-7, B-7, B-8, B-9, B-11, B-12, B-16, B-22, B-24 and B-25).

Cover depths ranged from 0.50 to 7.00 feet with a median of 4.00 feet and an average of 3.77 feet. Six borings had less than 4 feet of cover and seven borings had 4 or more feet of cover.

Soil types of the cover material in these 13 borings where trash was encountered included non-specified cover soil, silt, sand, gravely clay, silty lean clay (CL-ML), clay loam, and clay to varying extents

The soil type of the cover material in many of the borings (e.g., CL-ML) would not typically meet the TCEQ requirements for Plasticity Index and Liquid Limits of landfill soil caps.

There is no indication that that any samples or tests were conducted for compaction, plasticity index, or liquid limits when the cover material was applied.

Data above summarized by Bruce Wiland with Zilker Neighborhood Association from City's laboratory reports.

Analytical Results Summary for Monitoring Well MW-1 Butler Landfill in Zilker Park (Austin, Texas)

Only constituents above detection limits are shown. See complete lab results to view all constituents that were analyzed and their associated detection limits. Butler Landfill ceased operation in 1967. MW-1 was completed by Underground Resource Management, Inc. (URM) on 24 Feb 1984. MW-1 was plugged in February 2010.

Constituent	30 May 1984 ^a	23 Sep 1992 ^b	22 Oct 1997 ^c	RBSV ^d
Conductivity (µmhos/cm)	4,300	dna	dna	ns
TDS (mg/L)	2,200	dna	1,200	ns
Alkalinity (mg/L)	1,400	dna	720	ns
Sulfates (mg/L)	dna	dna	73.9	ns
Chlorides (mg/L)	dna	dna	31.5	ns
TOC (mg/L)	dna	dna	21.4	ns
Total Hardness (mg/L)	dna	dna	665	ns
Aluminum (µg/L)	dna	dna	37	3,650
Barium (µg/L)	dna	720	690	2,000
Calcium (µg/L)	132,000	dna	173,000	ns
Chromium (µg/L)	ND (<50)	42	ND (<5)	100
Iron (µg/L)	dna	26,800	14,200	ns
Magnesium (µg/L)	84,000	79,900	33,200	ns
Manganese (µg/L)	dna	268	390	171.6
Mercury (µg/L)	ND (<1)	2.0	ND (<0.5)	2
Molybdenum (µg/L)	dna	206	dna	18.3
Potassium (µg/L)	153,000	dna	40,500	ns
Sodium (µg/L)	336,000	dna	41,200	ns
Zinc (µg/L)	320	82.5	99	1,095
Cyanide, Total (µg/L)	dna	24	ND (<8)	200
Chlorobenzene (µg/L)	ND (<10)	9.2	10	100
1,4-Dichlorobenzene (µg/L)	ND (<10)	16.2 (EPA 624) 9.4 (EPA 625)	ND (<10)	75

dna = did not analyze

ND = Not Detected

ns = no standard

^a Sampled by URM.

^b Sampled by the City of Austin and analyzed by NCRC Laboratories, Inc.

^c Analyzed by Certes Environmental Laboratories, LLC

^d TCEQ Risk-based Screening Values (based on Risk Reduction Standard 2 or MCL)

Data above summarized by Zilker Neighborhood Association from City's laboratory reports.

**Analytical Results Summary for Monitoring Wells MW-2 through MW-7
Butler Landfill in Zilker Park (Austin, Texas)**

All wells sampled by EMCON on 20 Mar 1998, except MW-6 which was sampled on 18 Mar 1998, and analyzed by Certes Environmental Laboratories LLC. Only constituents above detection limits are shown. See complete lab results to view all constituents that were analyzed and their associated detection limits. Landfill ceased operation in 1967. Wells MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7 were drilled by EMCON from 16 Mar 1998 to 19 Mar 1998. Wells MW-3, MW-4, and MW-7 were plugged in February 2010. There is no record of MW-2, MW-5, or MW-6 ever being plugged.

Constituent	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	RBSV*
Aluminum (µg/L)	219,000	34,700	4,120	145,000	98,600	186,000	3,650
Arsenic (µg/L)	78	88	ND (<30)	150	31	73	50
Barium (µg/L)	2,590	650	200	2,250	1,270	1,390	2,000
Cadmium (µg/L)	6	ND (<5)	ND (<5)	6	ND (<5)	ND (<5)	5
Chromium (µg/L)	210	37	8	220	130	160	100
Iron (µg/L)	273,000	62,600	5,980	281,000	112,000	220,000	ns
Lead (µg/L)	270	ND (<15)	ND (<15)	200	120	150	15
Manganese (µg/L)	8,040	3,960	460	7,750	2,060	5,230	171.6
Mercury (µg/L)	1.3	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	2
Zinc (µg/L)	950	140	ND (<50)	560	340	550	1,095

* TCEQ Risk-based Screening Values (based on Risk Reduction Standard 2 or MCL)

ND = Not Detected

Data above summarized by Zilker Neighborhood Association from City's laboratory reports.