

MEMO

To: Jason Lowery, P.G., Wisconsin Department of Natural Resources

Cc:

From: Mark Manthey, P.G., Tetra Tech

Date: October 2, 2019

Subject: Well Repairs and Site Maintenance at the Former Barrett Landfill Property, New Berlin, Wisconsin.

The well repairs and other site maintenance completed by Tetra Tech during the first two weeks of September 2019 is summarized below. Photographs documenting the work are attached.


1. The damaged PVC casing of monitoring well B-96-13 was replaced with a new piece of PVC. The grout seal in the annular space was replaced. The original protective casing was reinstalled and adjusted to a workable height. The cap liner was reinstalled (Photos 1 – 8).
2. The casing of monitoring well B-96-13A was cut down to a workable height (Photo 9).
3. The 2-inch PVC casing of leachate head well LHW-94-1 was cut down to allow the protective cover to close (Photo 10).
4. The damaged PVC casing and steel protective casing of monitoring well B-19 were removed and replaced with new piece of PVC and a new steel protective casing. The annular space grout seal was not disturbed during the repair work so it did not require replacement. (Photos 11 – 15).
5. The bend in the PVC casing of monitoring well B-94-19A at a depth of approximately 6.3 feet below grade could not be straightened by inserting drill rods in the casing as described in our July 30, 2019 proposal (Photo 16). Options to consider include the following:
 - a. Bring in a small backhoe to excavate down to the bend to cut out the bad piece of PVC casing and replace it with a new piece of PVC.
 - b. Abandon the well and install a replacement.
 - c. Use the existing monitoring well with the knowledge that the bend in the casing requires the use of force to get the bailer past the bend in the casing.
6. New locks and lockable well caps were installed on monitoring wells B-96-13 and B-96-13A (Photo 17).

7. A new Royer cover was installed on the protective casing of leachate head well LHW-94-5 (Photo 18).
8. New locks were installed on the protective casings of gas probes GP-3, GP-5 and GP-12, leachate head wells LHW-94-1, LWH-94-5 and LHW-94-6, and monitoring wells B-96-13, B-96-13A, B-15, B-96-17, B-96-17A, B-19, B-96-26 W-23 and W-23A (Photo 19).
9. New vent screens were installed on gas vents GV-100 and GV-101 (Photos 20 – 23).
10. The holes and tears in the boot liners of gas vents GV-119, GV-124, GV-135, GB-137 and GV-138 were covered with 330x HVAC permanent air-tight seal tape (Photos 24 – 28). The HVAC seal tape was used instead of Fernco couplings as described in our July 30, 2019 proposal as it provided a better seal around the holes and tears than Fernco couplings.
11. Monitoring wells B-96-13, B-96-13A and B-19 and leachate head well LHW-94-1 were re-surveyed after the repairs described above were completed. A table containing the survey data provided by the surveyor subcontractor (Kapur & Associates, Inc.) and a site figure with the survey data for all the site wells including the re-surveyed wells are attached.
12. The three monitoring wells that were repaired (B-96-13, B-96-13A and B-19) were re-developed after the well repairs were completed to remove any material that may have fallen into the well during the repair process. The groundwater purged from the wells was contained and disposed of in the leachate collection tank.

PHOTOGRAPHS

**Attachment 1
Photograph Documentation Log
Barrett Landfill, WI
License No. 1940**

Photo: 1	
Description: Starting repair on monitoring well B-96-13.	
Date: 9-4-2019	

Photo: 2	
Description: Removing protective casing and boot liner on B-96-13.	
Date: 9-4-2019	



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Photo: 3	
Description: Additional steel protective casing at two feet below grade on B-96-13.	
Date: 9-4-2019	

Photo: 4	
Description: Removing bent steel casing from B-96-13.	
Date: 9-4-2019	



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Photo: 5	
Description: Bent PVC riser replaced on B-96-13.	
Date: 9-4-2019	

Photo: 6	
Description: Material in annular space replaced around B-96-13.	
Date: 9-4-2019	



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Photo: 7	
Description: B-96-13 protective casing and boot liner reinstalled to a workable height.	
Date: 9-4-2019	

Photo: 8	
Description: Completed repair on B-96-13.	
Date: 9-4-2019	



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Photo: 9	
Description: Monitoring well B-96-13A cut down to a workable height.	
Date: 9-4-2019	

Photo: 10	
Description: Leachate head well LHW-94-1 cut down to allow casing to close.	
Date: 9-4-2019	

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Photo: 11	
Description: Starting repair of monitoring well B-19.	
Date: 9-4-2019	

Photo: 12	
Description: Large rock shifted into riser causing bend at 1.5 feet below grade of monitoring well B-19.	
Date: 9-4-2019	

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Photo: 13	
Description: Monitoring well B-19 excavated down to bend.	
Date: 9-4-2019	

Photo: 14	
Description: B-19 riser cut down below bend and replaced with a coupling.	
Date: 9-4-2019	

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Photo: 15	
Description: New protective casing installed around B-19 due to broken lock mechanism on old casing.	
Date: 9-4-2019	

Photo: 16	
Description: Bend in PVC at 6.3 feet below grade unable to be fixed with drill rods in monitoring well B-94-19A.	
Date: 9-4-2019	

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Photo: 17	
Description: Lockable well caps installed in monitoring wells where protective casing cannot be locked.	
Date: 9-5-2019	

Photo: 18	
Description: New aluminum locking well cover installed on LHW-94-5.	
Date: 9-5-2019	

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Photo: 19	
Description: New locks placed on all gas probes, leachate head wells and monitoring wells that were missing them.	
Date: 9-5-2019	

Photo: 20	
Description: New gas vent screen installed on GV-100 with aluminum screen	
Date: 9-5-2019	

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Photo: 21	
Description: Close up of new gas vent screen.	
Date: 9-5-2019	

Photo: 22	
Description: New gas vent screen installed on GV-101.	
Date: 9-5-2019	

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Photo: 23	
Description: Close up of new gas vent screen.	
Date: 9-5-2019	

Photo: 24	
Description: 330x HVAC permanent air-tight seal tape used to seal holes in boot liners of gas vents GV-119, GV-124, BG-135, GV-137 and GV-138. This photo shows the repaired boot liner around GV-137.	
Date: 9-5-2019	

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Photo: 25	
Description: Seal installed on GV-135.	
Date: 9-5-2019	

Photo: 26	
Description: Seal installed on GV-138.	
Date: 9-5-2019	



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Photo: 27	 A vertical photograph showing a grey well casing in a field of tall grass. A black seal is wrapped around the casing, with a clear plastic sealant applied over it. The sealant is crinkled and appears to be a thick, clear adhesive or resin.
Description: Seal installed on GV-119.	
Date: 9-5-2019	

Photo: 28	 A vertical photograph showing a grey well casing in a field of tall grass. A clear plastic sealant is applied over a black seal on the casing. The sealant is crinkled and appears to be a thick, clear adhesive or resin. The background shows a blue sky and some green foliage.
Description: Seal installed on GV-124.	
Date: 9-5-2019	

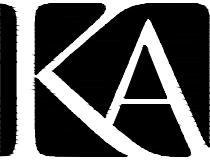
**REPAIRED WELLS
SURVEY DATA**

Barrett Landfill Repaired Wells Survey Data

SHOTID	Well ID	Wisconsin State Plane Coordinates		Protector Top Elevation (ft msl)	Well Casing Elevation (ft msl)	Ground Elevation (ft msl)	SVY_DESC
		Northing	Easting				
1036	MWEL B-96-13	362,873.10	2,488,753.68	975.84	975.60	972.04	MWEL B-96-13 PLASTIC
1037	MWEL B-96-13A	362,857.73	2,488,750.31	976.16	975.97	972.16	MWEL B-96-13A PLASTIC
1029	MWEL B-19	362,885.47	2,488,412.94	959.89	959.65	957.39	MWEL B-19 STEEL
1030	LHW 94-1	362,784.35	2,488,339.69	965.23	965.36	962.38	MWEL LHW 94-1 STEEL

SHOTID	Well ID	WTM83 Coordinates	
		Northing	Easting
1036	MWEL B-96-13	919,679.92	2,194,619.13
1037	MWEL B-96-13A	919,664.55	2,194,615.76
1029	MWEL B-19	919,692.33	2,194,278.42
1030	LHW 94-1	919,591.24	2,194,205.16

SHOTID	Well ID	Latitude	Longitude
1036	MWEL B-96-13	42.98096163	-88.17351827
1037	MWEL B-96-13A	42.98091968	-88.17353211
1029	MWEL B-19	42.98101602	-88.1747903
1030	LHW 94-1	42.98074305	-88.17507225



KAPUR & ASSOCIATES, INC.
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7711 N. PORT WASHINGTON ROAD
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PROJECT:
MONITORING WELL EXHIBIT

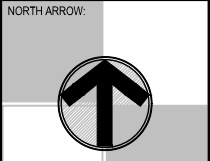
LOCATION:
BARNETT LANDFILL

CLIENT:
TETRA TECH
DNR

RELEASE:

REVISIONS:

#	DATE	DESCRIPTION



SCALE: 1" = 200'

SEAL:

SHEET:
MW EXHIBIT

PROJECT MANAGER: JH
PROJECT NUMBER: 19.0007.01
DATE: 20'9/09/10

SHEET NUMBER:
1 of 1

MONITORING WELLS

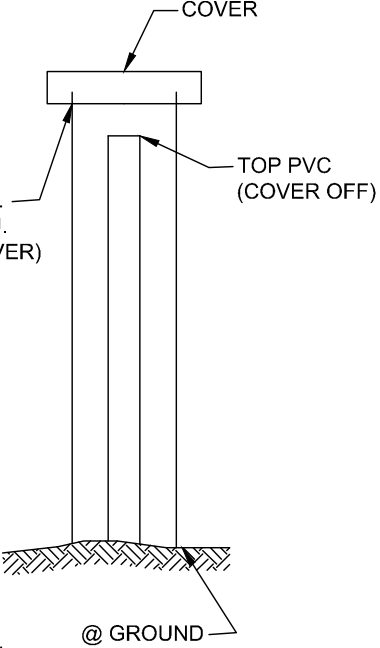
POINT No.	NAME	ELEVATION			NORTH	EAST
		TOP STEEL	PVC TOP	GROUND		
1000	LHW 94-3	989.59	988.94	362420.08	2487954.21	
1002	W-23	985.56	985.24	984.96	362246.11 2488919.24	
1003	W-23A	985.82	985.50	985.07	362263.92 2488916.03	
1005	MWEL CMCP XYZ #1			986.19	362183.91 2488944.10	
1006	MWEL CMCP XYZ #2			986.46	362173.85 2488945.09	
1015	B-94-26	1018.58	1016.98	1016.08	361657.62 2488523.65	
1026	B-94-25	950.48	950.63	949.24	362878.50 2488101.40	
1027	B-94-25A	951.26	951.39	949.38	362878.91 2488109.29	
1028	B-94-19A	959.74	959.76	958.06	362886.48 2488423.26	
1029	B-19 STEEL	959.89	959.65	957.39	362885.47 2488412.94 NEW 2019/09/10	
1030	LHW 94-1 STEEL	965.23	965.36	962.38	362784.35 2488339.69 NEW 2019/09/10	
1036	B-96-13 PLASTIC	975.842	975.60	972.04	362873.10 2488753.68 NEW 2019/09/10	
1037	B-96-13A PLASTIC	976.162	975.97	972.16	362857.73 2488750.31 NEW 2019/09/10	
1079	LHW 94-6	1033.40	1032.75	1031.40	361802.57 2488676.25	
1080	LHW 94-5	1033.51	1033.15	1031.56	361781.96 2488229.60	
1502	94-14-R	954.00	954.18	952.17	362836.05 2487761.94	
1503	94-14A	953.78	954.32	952.05	362832.02 2487765.76	
1523	W-24	1011.83	1012.04	1008.62	361659.16 2488072.48	
1534	B-96-17B	974.39	974.44	973.47	361836.08 2487792.76	
1535	B-96-17A?	974.29	974.33	972.82	361839.19 2487787.54	
1542	B21	964.04	963.01	961.63	362207.76 2487752.51	
1543	B21A	963.81	963.69	961.83	362210.06 2487756.89	
1561	B-15A	960.17	960.10	957.55	362521.04 2487753.90	
1562	B-15	957.21	957.07	956.32	362522.23 2487745.30	
1572	B-96-18A	973.86	973.87	971.96	361626.00 2489010.28	
1573	B-96-18B	974.50	974.66	972.73	361629.32 2489005.40	

GAS PROBES

POINT No.	NAME	ELEVATION				NORTH	EAST
		TOP STEEL	PVC TOP S	PVC TOP D	PVC TOP M		
1009	GP-8	992.68	992.16	992.05	992.02	990.08	361994.12 2488970.17
1010	GP-9	995.09	995.72	995.73	995.64	994.14	361755.35 2488969.06
1011	GP-10	998.84	998.86	998.86	999.13	998.54	361652.19 2488786.74
1038	PLAST GP-3	976.67	976.52	976.39	976.60	976.67	362848.89 2488781.61
1504	GP-5	954.07	953.97	CANT OPEN	CANT OPEN	953.42	362796.74 2487754.04
1516	GP-11	1014.27	1014.42	1014.37	1014.41	1011.74	361628.65 2488379.11
1528	GP-12	973.61	973.59	973.75	973.76	970.69	361817.39 2487768.23
1547	GP-2	963.88	963.73	963.45	-	961.83	362213.34 2487756.85
1553	GP-6	968.90	968.63	968.65	968.68	967.78	362306.68 2487778.65
1567	GP-1	959.92	959.62	-	-	957.41	362511.59 2487747.64

GAS VENTS

POINT No.	NAME	GROUND ELEV.	NORTH	EAST
1007	100	986.06	362194.91	2488943.25
1008	0	986.01	362202.01	2488942.37
1012	138	998.41	361687.03	2488829.04
1013	139	1010.87	361681.32	2488676.19
1014	140	1019.80	361680.33	2488513.93
1016	141	1021.10	361671.99	2488370.64
1017	142	1019.04	361679.58	2488217.68
1018	143	1004.31	361738.28	2488111.18
1019	LHW OLD	1001.84	361778.61	2488093.06
1020	144	998.85	361840.02	2488027.14
1021	145	989.91	361847.24	2487899.88
1022	113	989.93	361968.05	2487845.05
1023	128	988.34	362109.21	2487847.45
1024	118	982.29	362306.05	2487836.11
1025	114	973.71	362473.35	2487831.31
1031	101	959.94	362802.36	2488298.29
1032	102	964.71	362832.76	2488487.49
1033	103	971.64	362834.19	2488655.59
1034	110	973.91	362714.27	2488642.48
1035	104	973.93	362829.97	2488789.86
1039	109	972.52	362668.47	2488487.19
1040	108	969.18	362648.88	2488345.01
1041	107	965.84	362623.34	2488168.95
1042	106	968.57	362589.40	2488006.62
1043	105	964.62	362606.88	2487866.68
1044	4	989.43	362412.71	2487947.81
1045	3	989.56	362452.83	2488087.41
1046	2	987.10	362485.90	2488232.78
1047	1	987.34	362501.24	2488374.67
1048	112	984.68	362519.29	2488522.97
1049	116	998.80	362411.73	2488400.31
1050	115	1003.92	362371.35	2488272.25
1051	111	1009.97	362325.86	2488147.08
1052	5	1003.82	362254.28	2487948.35
1053	120	1027.15	362192.08	2488183.25
1054	121	1019.19	362262.90	2488346.60
1055	122	1030.57	362106.52	2488329.47
1056	124	1032.88	362030.04	2488193.81
1057	129	1030.99	361953.78	2488045.09
1058	119	1030.62	362106.32	2488058.34
1059	130	1031.21	361870.70	2488175.68
1060	131	1032.06	361831.48	2488309.08
1061	125	1029.80	361974.90	2488368.22
1062	127	1029.10	361871.38	2488505.84
1063	132	1031.23	361793.47	2488417.83
1064	133	1030.92	361785.21	2488525.66
1065	134	1030.54	361822.18	2488644.94
1066	135	1026.80	361810.22	2488811.69
1067	136	997.45	361952.05	2488874.92
1068	146	977.32	362002.47	2488718.16
1069	126	972.34	362066.71	2488582.24
1070	123	968.91	362187.79	2488531.83
1071	117	967.48	362357.64	2488556.27
1081	137	994.74	361783.53	2488953.80



○MW MONITORING WELL
○GP GAS PROBE
○GV GAS PIPE VENT



FILENAME: S:\Work_Co\Vendor\Barnett\Barnett Landfill\Survey\190007.JL - 2019-09-11.dwg