



**Review of 2016 1<sup>st</sup> Semi-annual Groundwater Monitoring Report  
for  
J.E.D. Solid Waste Management Facility**

Review Dates: 9/14/16 Finalized 12/19/16	Reviewed By: Allen Rainey, Environmental Specialist III	WACS Facility ID #: 89544
Facility Name: J.E.D. Solid Waste Management Facility	County: Osceola	
Monitoring Period: May 2016		
Type: Routine	Facility Class Types: Class I, Construction & Demolition Debris	
Report Date: 8/5/16	Received Date: 8/8/16	WACS Upload Date: 8/8/-6 (8:06 pm)
Prepared By: Geosyntec Consultants	Submitted By: Geosyntec Consultants	
Report Title: 24 <sup>th</sup> Semi-annual Water Quality Monitoring Report		

**Review Details**

Summary

- Benzene concentrations in several wells (see table and graphs below) continue to trend upward. The report indicates that a likely source of benzene in the wells is landfill gas.
- The Department continues to work with the facility concerning corrective actions for landfill gas influences upon the saturation zone.

Parameter Exceedances

- Benzene standard (1 µg/L) was exceeded in groundwater wells as follows. The report indicates that a likely source of benzene is landfill gas. This is the first exceedance of benzene in wells MW-10B and MW-16AR.

Well ID	Well Type	Concentration (µg/L)	Comment
MW-1A	Detection	1.6	Similar to recent levels
MW-3A	Detection	5.5	Decrease to past lower levels
MW-4A	Detection	1.1	Lower than previous levels
MW-6A	Detection	3	Decrease to past lower levels
MW-9A	Detection	12	Similar to recent levels
MW-10A	Detection	5	Increase toward past levels
MW-10B	Detection	5.8	Previous levels below standard.
MW-11A	Detection	8.4	Increase to past levels
MW-12A	Detection	4.3	Decrease to past levels
MW-13A	Detection	1.5	Decrease; lower than recent levels
MW-16AR	Detection	1.2	Previous levels below standard.

- Sodium standard (160 mg/L) was exceeded in detection well MW-1A at 318 mg/L.
- Chloride standard (250 mg/L) was exceeded in detection well MW-1A at 495 mg/L.
- Ammonia 62-777 GCTL (2.8 mg/L) was exceeded in 13 A-zone groundwater wells and 5 B-zone groundwater wells. The facility's MPIS establishes a background concentration of 10 mg/L for wells MW-5A, MW-9A, MW-10A, and MW-11A. Ammonia concentrations in those wells were below the MPIS background. The report concludes that "The preponderance of evidence does support the concept that the source of ammonia is from reductive dissolution reactions mobilizing ammonia present in site soils. Shallow groundwater at the site is strongly reducing favoring the process of reductive dissolution."
- Total dissolved solids standard (500 mg/L) was exceeded in 5 A-zone groundwater wells and 7 B-zone groundwater wells.
- Iron standard (0.3 mg/L) was exceeded in a majority of groundwater wells. Dissolved iron concentrations in detection wells MW-25B and MW-27B were 986 µg/L and 596 µg/L, respectively. The surface water standard for iron (1 mg/L) was exceeded in surface water location SW-4.
- pH in all of the wells was below the range of 6.5 to 8.5. That is consistent with data since 2010.

Notations

- Sodium and chloride exceedances first appeared during the November 2012 monitoring period and have occurred only in well MW-1A.
  - The report states the concentrations "have indicated a downward trend since the 19<sup>th</sup> semi-annual water quality monitoring event when these detections peaked." (The 19<sup>th</sup> monitoring event was November 2013.) Although the concentrations since November 2013 have been lower than the peak, they show an increasing trend from November 2012 thru May 2016. (The graphs depicting data from WACS are at the end of this review document.)

- The report attributes the current concentrations to stormwater runoff and erosion of cover soil “from uncapped areas that occurred within the past year.” The facility has installed additional stormwater downpiping and an outfall structure in this area and expects these improvements will correct stormwater drainage issues in the vicinity of well MW-1A. Therefore, the concentrations of sodium and chloride are expected to decrease in well MW-1 over time. The Department accepts their recommendation to continue to monitor sodium and chloride as part of the current MPIS.
- The evaluation monitoring mentioned on report PDF page 19 was ended in November 2014. It does not impact this sampling event. However, evaluation monitoring wells CW-1A, CW-2A, and CW-3A are in the process of being added to the semi-annual monitoring requirements in the MPIS to ensure benzene is not migrating to the edge of the ZOD.
- The Department continues to work with the facility concerning corrective actions for landfill gas influences, primarily benzene, upon the saturation zone.
- For surface water location SW-3, the facility reported and uploaded to ADaPT the ammonia concentrations as ammonia-N (WACS Analyte ID #1515). In surface waters, however, the standard of 0.02 mg/L is for unionized ammonia (WACS Analyte ID #7664-41-7).
- Surface water samples were initially collected on 5/12/16. Following a laboratory error, the facility sampled both locations again on 5/25/16 and analyzed only for mercury.

#### Purging Completion

Dissolved oxygen $\leq$ 20% saturation? YES	Turbidity $\leq$ 20 NTUs? NO
If no, $\pm$ 0.2 mg/L or readings are within 10%? N/A	If no, $\pm$ 5 NTUs or readings are within 10%? NO <sup>T</sup>
Temperature $\pm$ 0.2° C? YES	pH $\pm$ 0.2 standard units? YES
Specific conductance $\pm$ 5% of reading? YES	

#### Sampling and Analysis

Sampling dates: May 10, 11, 12, 16, 25	Last lab analysis date: 5/31/16
# of active groundwater monitoring locations: 46	# of active surface water monitoring locations: 2
Initial sampling device: peristaltic & electric submersible pumps	Re-sampling device: N/A
All groundwater and surface water sampling points sampled? YES	All analyses performed? YES
Trip blanks? YES	Field or equipment blanks? YES
Lab certified under National Environmental Laboratory Accreditation Program? YES	

Unionized ammonia analysis? N/A	Phenols analysis? N/A	Unfiltered samples? NO <sup>F</sup>
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<sup>T</sup> criteria not achieved for well MW-28A

<sup>F</sup> 1  $\mu$ m filter used for wells MW-25B, MW-27B (they were the only wells having turbidities > 100 NTUs)

#### Monitoring Plan Implementation Schedule Reporting Requirements

Revision Date: N/A	Effective Date: 7/16/15	Permit: SO49-0199726-022
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Notification made within 14 days of sampling? YES

Cover letter? NO

Ground Water Monitoring Report, DEP Form 62-520.900(2) (or equivalent)? YES

Certification Date: 6/15/16

Summary of exceedances & sampling issues? YES

Groundwater contour maps? YES <sup>a</sup>

Contour maps signed and sealed? YES

Water levels & water elevation table? YES

Water level measurements made within one-day period? YES

Groundwater Sampling Logs, DEP Form FD 9000-24? YES

Chain of custody forms? YES <sup>N</sup>

Conclusions and recommendations? YES

Lab and field EDD files named correctly (89544\_201605\_swldd.txt & 89544\_201605\_swfdd.txt)? YES

Report named correctly (89544\_201605\_swgwmr.pdf)? YES

File(s) indicate successful data export? YES

Report signed and sealed by P.G.? YES

Date signed and sealed: 8/5/16

Report received within 60 days of completing lab analysis? NO (The last day of laboratory analysis was 5/31/16. The Department received the report on 8/8/16, which is 9 days past the 7/30/16 due date.)

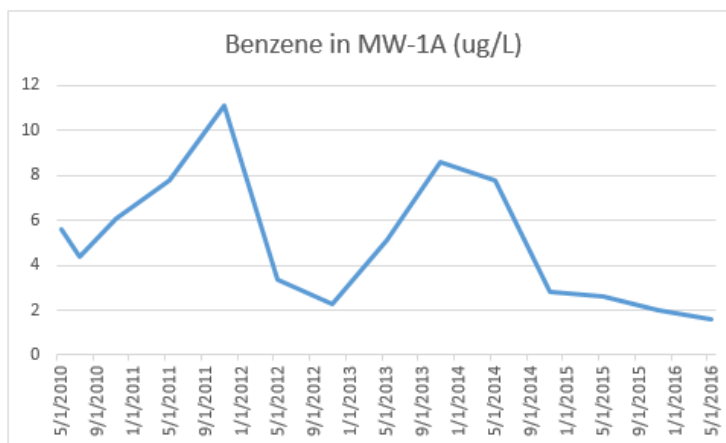
<sup>a</sup> contour map for A-zone wells only

<sup>N</sup> the Chain of Custody forms for sampling events on May 10, 11, and 25 are not signed as received by the laboratory

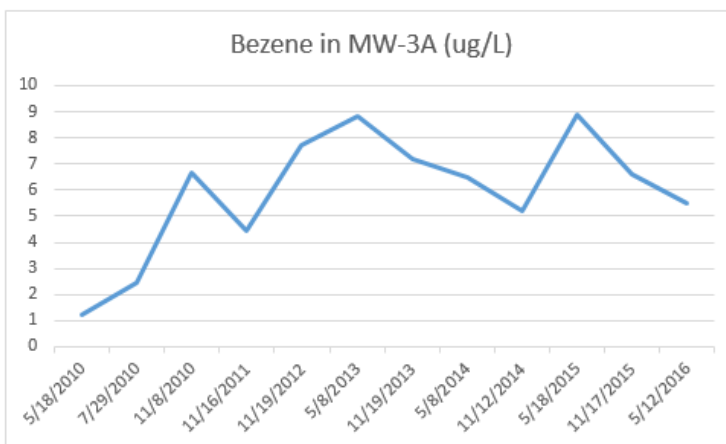
#### Graphs

### Benzene concentrations in monitoring wells (µg/L)

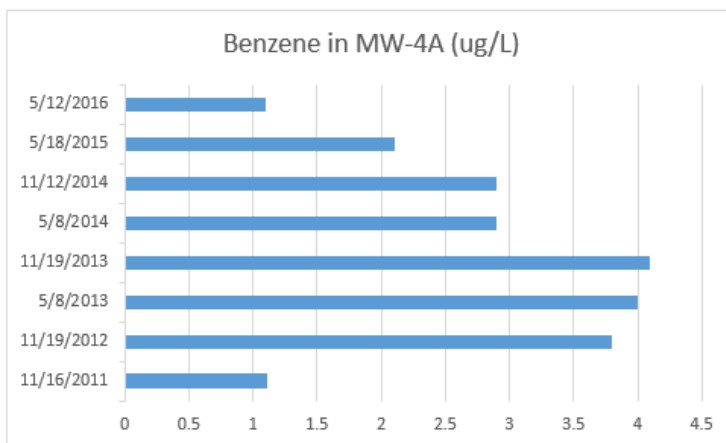
MW-1A	5/19/2010	5.6	UG/L
MW-1A	7/29/2010	4.38	UG/L
MW-1A	11/9/2010	6.1	UG/L
MW-1A	5/19/2011	7.78	UG/L
MW-1A	11/16/2011	11.1	UG/L
MW-1A	5/16/2012	3.35	UG/L
MW-1A	11/15/2012	2.3	UG/L
MW-1A	5/9/2013	5.1	UG/L
MW-1A	11/18/2013	8.6	UG/L
MW-1A	5/6/2014	7.8	UG/L
MW-1A	11/12/2014	2.8	UG/L
MW-1A	5/7/2015	2.6	UG/L
MW-1A	11/18/2015	2	UG/L
MW-1A	5/12/2016	1.6	UG/L



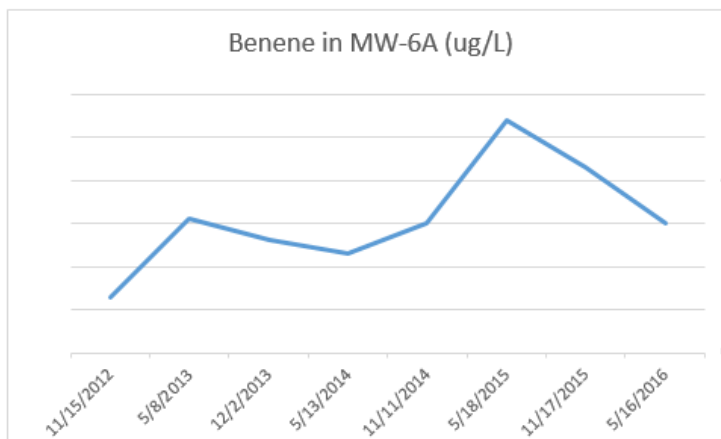
MW-3A	5/18/2010	1.2	ug/L
MW-3A	7/29/2010	2.43	ug/L
MW-3A	11/8/2010	6.65	ug/L
MW-3A	11/16/2011	4.46	ug/L
MW-3A	11/19/2012	7.7	ug/L
MW-3A	5/8/2013	8.8	ug/L
MW-3A	11/19/2013	7.2	ug/L
MW-3A	5/8/2014	6.5	ug/L
MW-3A	11/12/2014	5.2	ug/L
MW-3A	5/18/2015	8.9	ug/L
MW-3A	11/17/2015	6.6	ug/L
MW-3A	5/12/2016	5.5	ug/L



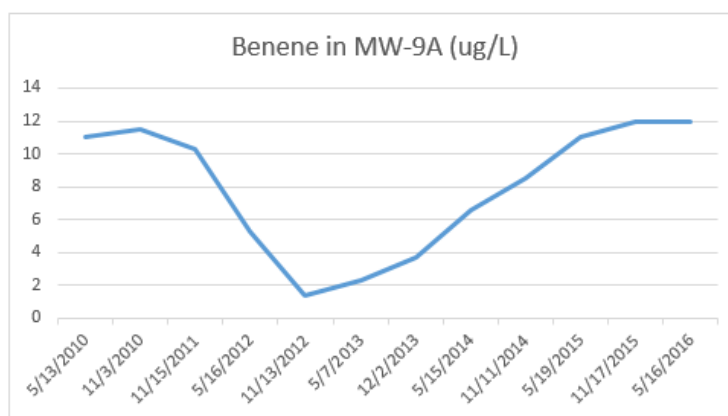
MW-4A	11/16/2011	1.11	ug/L
MW-4A	11/19/2012	3.8	ug/L
MW-4A	5/8/2013	4	ug/L
MW-4A	11/19/2013	4.1	ug/L
MW-4A	5/8/2014	2.9	ug/L
MW-4A	11/12/2014	2.9	ug/L
MW-4A	5/18/2015	2.1	ug/L
MW-4A	5/12/2016	1.1	ug/L



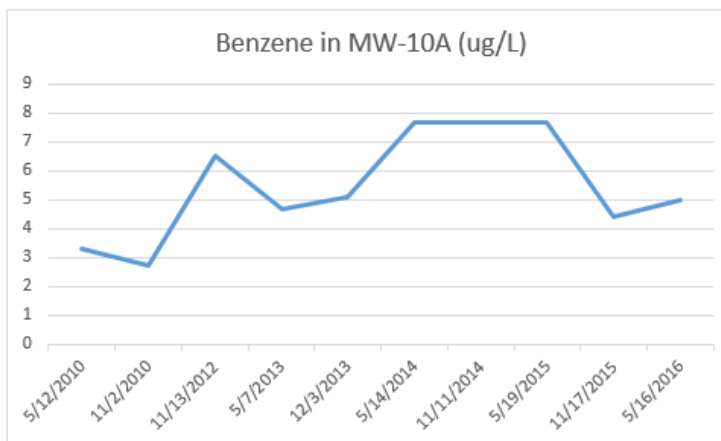
MW-6A	11/15/2012	1.3	ug/L
MW-6A	5/8/2013	3.1	ug/L
MW-6A	12/2/2013	2.6	ug/L
MW-6A	5/13/2014	2.3	ug/L
MW-6A	11/11/2014	3	ug/L
MW-6A	5/18/2015	5.4	ug/L
MW-6A	11/17/2015	4.3	ug/L
MW-6A	5/16/2016	3	ug/L



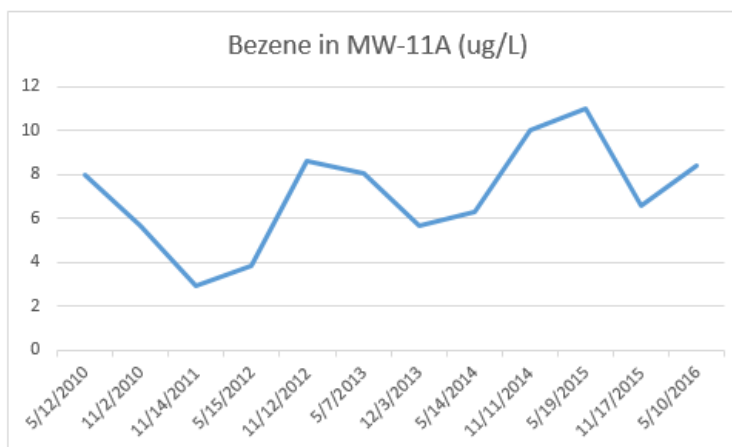
MW-9A	5/13/2010	11	ug/L
MW-9A	11/3/2010	11.5	ug/L
MW-9A	11/15/2011	10.3	ug/L
MW-9A	5/16/2012	5.24	ug/L
MW-9A	11/13/2012	1.4	ug/L
MW-9A	5/7/2013	2.3	ug/L
MW-9A	12/2/2013	3.7	ug/L
MW-9A	5/15/2014	6.6	ug/L
MW-9A	11/11/2014	8.5	ug/L
MW-9A	5/19/2015	11	ug/L
MW-9A	11/17/2015	12	ug/L
MW-9A	5/16/2016	12	ug/L



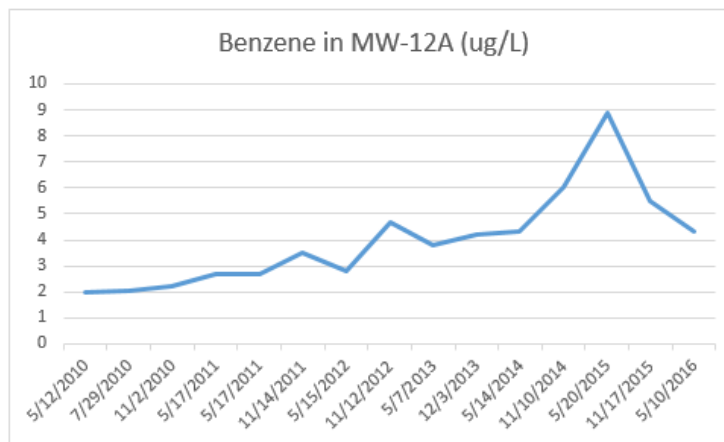
MW-10A	5/12/2010	3.3	ug/L
MW-10A	11/2/2010	2.74	ug/L
MW-10A	11/13/2012	6.5	ug/L
MW-10A	5/7/2013	4.7	ug/L
MW-10A	12/3/2013	5.1	ug/L
MW-10A	5/14/2014	7.7	ug/L
MW-10A	11/11/2014	7.7	ug/L
MW-10A	5/19/2015	7.7	ug/L
MW-10A	11/17/2015	4.4	ug/L
MW-10A	5/16/2016	5	ug/L



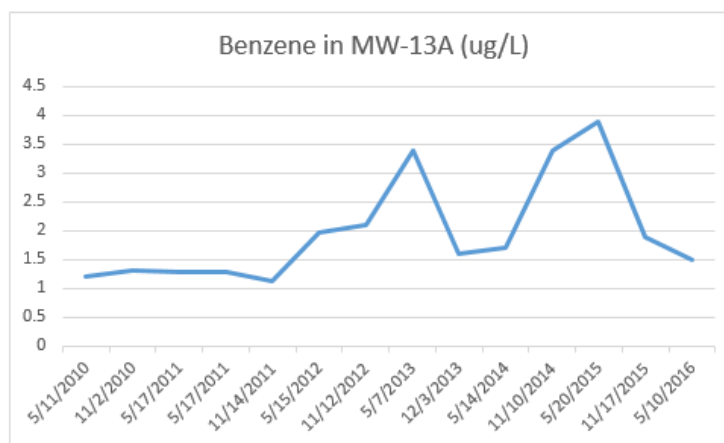
MW-11A	5/12/2010	8	ug/L
MW-11A	11/2/2010	5.65	ug/L
MW-11A	11/14/2011	2.95	ug/L
MW-11A	5/15/2012	3.84	ug/L
MW-11A	11/12/2012	8.6	ug/L
MW-11A	5/7/2013	8.1	ug/L
MW-11A	12/3/2013	5.7	ug/L
MW-11A	5/14/2014	6.3	ug/L
MW-11A	11/11/2014	10	ug/L
MW-11A	5/19/2015	11	ug/L
MW-11A	11/17/2015	6.6	ug/L
MW-11A	5/10/2016	8.4	ug/L



MW-12A	5/12/2010	2	ug/L
MW-12A	7/29/2010	2.03	ug/L
MW-12A	11/2/2010	2.19	ug/L
MW-12A	5/17/2011	2.69	ug/L
MW-12A	5/17/2011	2.69	ug/L
MW-12A	11/14/2011	3.5	ug/L
MW-12A	5/15/2012	2.83	ug/L
MW-12A	11/12/2012	4.7	ug/L
MW-12A	5/7/2013	3.8	ug/L
MW-12A	12/3/2013	4.2	ug/L
MW-12A	5/14/2014	4.3	ug/L
MW-12A	11/10/2014	6	ug/L
MW-12A	5/20/2015	8.9	ug/L
MW-12A	11/17/2015	5.5	ug/L
MW-12A	5/10/2016	4.3	ug/L

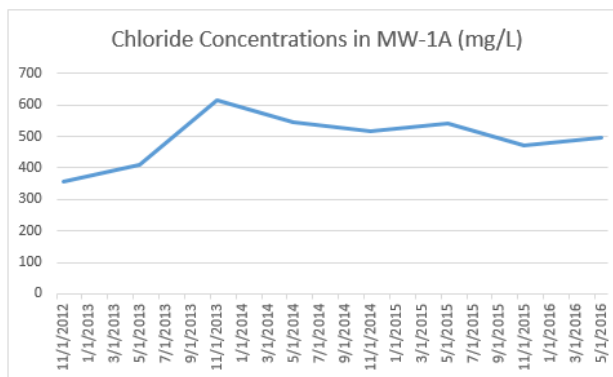


MW-13A	5/11/2010	1.2	ug/L
MW-13A	11/2/2010	1.31	ug/L
MW-13A	5/17/2011	1.28	ug/L
MW-13A	5/17/2011	1.28	ug/L
MW-13A	11/14/2011	1.14	ug/L
MW-13A	5/15/2012	1.98	ug/L
MW-13A	11/12/2012	2.1	ug/L
MW-13A	5/7/2013	3.4	ug/L
MW-13A	12/3/2013	1.6	ug/L
MW-13A	5/14/2014	1.7	ug/L
MW-13A	11/10/2014	3.4	ug/L
MW-13A	5/20/2015	3.9	ug/L
MW-13A	11/17/2015	1.9	ug/L
MW-13A	5/10/2016	1.5	ug/L



### Chloride (250 mg/L) and sodium (160 mg/L) exceedances in monitoring well MW-1A

MW-1A	11/15/2012	358	mg/L
MW-1A	5/9/2013	412	mg/L
MW-1A	11/18/2013	617	mg/L
MW-1A	5/6/2014	544	mg/L
MW-1A	11/12/2014	518	mg/L
MW-1A	5/7/2015	542	mg/L
MW-1A	11/18/2015	472	mg/L
MW-1A	5/12/2016	495	mg/L



MW-1A	11/15/2012	198	mg/L
MW-1A	5/9/2013	201	mg/L
MW-1A	11/18/2013	326	mg/L
MW-1A	11/18/2013	336	mg/L
MW-1A	5/6/2014	297	mg/L
MW-1A	11/12/2014	290	mg/L
MW-1A	11/12/2014	289	mg/L
MW-1A	5/7/2015	282	J mg/L
MW-1A	11/18/2015	243	mg/L
MW-1A	11/18/2015	248	mg/L
MW-1A	5/12/2016	318	mg/L

