TUMAMOC LANDFILL
TUCSON, ARIZONA

2016 ANNUAL MONITORING REPORT
GROUNDWATER AND METHANE GAS MONITORING RESULTS

DECEMBER 9, 2016

Prepared by:
City of Tucson
Environmental & General Services Department
P.O. Box 27210
Tucson, Arizona 85726-7210

CITY OF TUCSON
ENVIRONMENTAL SERVICES

Table of Contents

Tables

Figures

Appendices

Acronyms

Aquifer Water Quality Standards	AWQS
Arizona Department of Environmental Quality	ADEQ
Carbon Dioxide	CO_2
City of Tucson - Environmental & General Services Department	COT-EGSD
Dissolved Oxygen	DO
Feet Below Ground Surface	ft bgs
Feet Above Mean Sea Level	ft amsl
Landfill Gas	LFG
Nephelometric Turbidity Units	NTU
Non-detect	ND
Methane	CH_4
Micrograms per liter	µg/l
Milligrams per liter	mg/l
Oxidation Reduction Potential	ORP
Oxygen	O_2
Preliminary Investigation	PI
Quality Assurance/Quality Control	QA/QC
Relative Percent Difference	RPD
Specific Conductivity	SpC
Tetrachloroethene	PCE
Trichloroethene	TCE
Volatile Organic Compounds	VOCs
Water Level	WL
Water Quality Assurance Revolving Fund	WQARF
Water Table Elevation	WTE

1.0 INTRODUCTION

The City of Tucson - Environmental & General Services Department (COT-EGSD) has prepared this report to document groundwater and methane gas monitoring activities conducted in 2016 at the Tumamoc Landfill located at 2100 West Starr Pass Boulevard in Tucson, Arizona. The location of the Tumamoc Landfill is presented on **Figure 1**. The COT operated the Tumamoc Landfill from 1962 to 1966 for city-wide municipal waste disposal under a lease agreement with the University of Arizona[1]. The COT-EGSD has correspondence in the Tumamoc Landfill project file which references the University of Arizona disposed of industrial wastes, possibly including hazardous substances, during the operational period of the landfill from 1962 through 1966[2]. The landfill property was deeded from Pima County to the City of Tucson in 2009 when Pima County acquired the Tumamoc Hill property from the Arizona State Land Department. The COT-EGSD has been monitoring methane gas at the waste footprint boundary adjacent to nearby structures since 2000 and has been monitoring groundwater at the site since 2002.

Historically, tetrachloroethene (PCE) concentrations in groundwater have exceeded the aquifer water quality standard (AWQS) of 5 micrograms per liter (µg/l) in monitoring wells WR-384A, WR-445A and WR-449A at the Tumamoc Landfill. There have been AWQS exceedances of 5 µg/l for trichloroethene (TCE) in monitoring well WR-384A from August 2014 through August 2016. Nitrate concentrations have historically been detected above the 10 milligrams per liter (mg/l) AWQS in monitoring wells WR-384A, WR-445A, WR-446A, WR-447A and WR-449A. The source of the nitrate in the groundwater is considered to be off-site as nitrate concentrations were highest in the upgradient groundwater monitoring wells at the site.

The Tumamoc Landfill site was temporarily placed on the Arizona Department of Environmental Quality's (ADEQ) Water Quality Assurance Revolving Fund (WQARF) Preliminary Investigation (PI) list in July 2004. The Tumamoc Landfill was removed from the PI list in May 2005 when ADEQ determined there were no known impacts to residents living in the area. ADEQ may periodically review the site status to determine if it should be placed on the WQARF PI List in the future[3].

---

[1] EEC Inc., *Environmental Assessment of Tumamoc Hill Solid Waste Landfill*, June 7, 1989

[2] Keene, James, City of Tucson City Manager, *Tumamoc Landfill Update Mayor & Council Memorandum*, September 18, 2000

[3] Miller, Shelley, Site Assessment Unit Environmental Program Specialist at the Arizona Department of Environmental Quality, *Tumamoc Landfill WQRF Preliminary Investigation Site Status*, May 23, 2005

1.1 Scope of Work

The following activities were conducted by COT-EGSD during 2016 at the Tumamoc Landfill:

- The depth to the static groundwater level was measured in the groundwater monitoring wells prior to groundwater sample collection on August 30, 2016 and August 31, 2016.

- Groundwater quality sampling and analysis events were conducted on August 30, 2016 and August 31, 2016.

- Monitoring of perimeter methane gas probes TU-1, TU-2, TU-3, TU-4, TU-5, TU-6, TU-7, TU-8, and TU-9 was performed quarterly during the months of January, April, July, and October 2016. Percentages of methane (CH_4), carbon dioxide (CO_2) and oxygen (O_2) were measured in the field during each sampling event using a Landtec Gas Analyzer.

- Engineering and Environmental Consultants, Inc. (EEC) from Tucson, Arizona conducted an inspection of the Tumamoc Landfill on October 6, 2016 as part of the COT-EGSD required annual inspection program for non-regulated closed landfills.

2.0 GROUNDWATER MONITORING

The 2016 groundwater sampling event was completed by COT-EGSD on August 30, 2016 and August 31, 2016 in accordance with the 2010 ASTM Standard D6699-01 *Standard Practice for Sampling Liquids Using Bailers* for collecting samples by a single check valve bailer. This standard should be referenced for a review of groundwater sampling and quality control procedures followed by COT-EGSD during the 2016 sampling event. A map showing the locations of all groundwater monitoring wells at the site is provided in **Figure 2**. Monitoring well construction information is presented in **Table 1**.

2.1 Water Level Monitoring

The depth to the static water table could not be measured in the August 2016 sampling event in well WR-386A as there was no groundwater in the well at the time. The depth to the static water table well WR-445A was inadvertently not recorded by COT-EGSD in the August 2016 sampling event. Due to storm water erosion, the access road leading to monitoring wells WR-448A and WR-448B was impassable. Therefore, water level measurement and groundwater sampling activities were not conducted at these wells.

Monitoring wells at the site have screens installed at variable depths to characterize deep and shallow groundwater quality and to allow for measurement of vertical hydraulic gradients (**Table**

1 and **Table 2)**. Several monitoring wells have screens installed across both the deep and shallow groundwater intervals and are denoted as "long screen" wells on **Figure 2**. For the purposes of this report, groundwater contour maps were prepared for the monitoring wells having shallow screens (less than 100 ft bgs) and were also prepared for the monitoring wells having deep or long screens, as listed on **Table 1** and shown on **Figure 3** and **Figure 4**. Although the long screen lengths in some of these wells may result in groundwater levels that are representative of neither the deep nor the shallow groundwater, but rather have a groundwater level at some intermediate elevation, this methodology provides a better depiction of the groundwater flow direction rather than plotting the groundwater depths from all the wells on one contour map.

Figure 3 and **Figure 4** represent the potentiometric surfaces of the groundwater based on the water level data collected in August 2016. The groundwater elevations and the groundwater flow direction observed at the Tumamoc Landfill are not typical water table conditions observed in an alluvial aquifer. Groundwater in the vicinity of the Tumamoc Landfill site is located within a bedrock aquifer and the flow is largely influenced by bedding planes, secondary porosity and fracture patterns.

The August 2016 groundwater potentiometric contour maps (**Figure 3** and **Figure 4**) show the groundwater flow direction in both the shallow and deep intervals of the aquifer is from the southwest to the northeast. This flow direction is consistent with previous monitoring events and with the surface drainage patterns. Groundwater elevations measured in the well pairs indicate that vertical hydraulic gradients are upward as the groundwater elevation in the shallow screened well is lower than the groundwater elevation in the deeper screened well (**Table 2**). The fact that the elevation of groundwater measured in wells installed in the deeper aquifer is higher than the groundwater elevation in the shallow aquifer indicates confined conditions exist in the lower aquifer. The upper aquifer appears to be unconfined in the vicinity of the Tumamoc Landfill.

Based on historical data, the base of the waste in the landfill is estimated to be approximately 2435 feet above mean sea level (ft amsl). The groundwater elevations are used to determine if the groundwater in the upper unconfined aquifer could potentially infiltrate the base of the waste. As shown on **Figure 5,** the groundwater elevations indicate that the base of waste (approximately 2435 ft amsl) has not been saturated by groundwater in the upper unconfined aquifer.

The groundwater level elevations observed in the deep screened wells at the site ranged from a high elevation at upgradient well WR-455A of 2464.45 ft amsl to the low elevation at downgradient well WR-385A of 2391.56 ft amsl. Shallow groundwater elevations for the site ranged from a high elevation at upgradient well WR-455B of 2463.31 ft amsl to a low elevation at downgradient well WR-384A of 2387.73 ft amsl.

The water level elevations in the deep screened wells may reflect confined aquifer conditions and not the depth to water in the confined aquifer below the waste.

Based on the 2016 water level measurements, the water table elevations in the shallow screened wells rose about 0.47 ft. with respect to the water table elevations observed in 2015 (-0.21 ft. in 2015 to 0.26 ft. in 2016).

2.2 Groundwater Sampling

As stated in Section 2.1 of this report, there was no groundwater in monitoring well WR-386A at the time of sampling in August 2016, therefore, no groundwater sample was collected from this well. Also discussed in Section 2.1 in this report, wells WR-448A and WR-448B could not be sampled in the August 2016 sampling event due to erosion of the access road leading to these wells.

The August 2016 groundwater samples were analyzed for volatile organic compounds (VOCs), anions, metals and general chemistry parameters. The complete analyte list for the August 2016 sampling event is provided in **Appendix A**. COT-EGSD collected field measurements for pH, specific conductivity (SpC), temperature, dissolved oxygen (DO) and oxidation reduction potential (ORP) at each monitoring well using a YSI multi-parameter meter equipped with a flow-through cell. Field data sheets for this sampling event are provided in **Appendix B**. The laboratory analytical report for the August 2016 sampling event is provided in **Appendix C**.

VOC Results

There were no exceedances for PCE in any of the groundwater monitoring wells in the August 2016 sampling event. PCE concentration trends have stabilized in all of the monitoring wells except for concentrations observed at shallow monitoring well WR-384A. PCE concentrations for all four of the long screened monitoring wells and from three of the six shallow screened monitoring wells from 2002 to 2016 are shown on **Figure 7**. From May 2002 through September 2013, PCE concentrations in shallow screened monitoring well WR-384A exceeded the AWQS of 5 µg/l. From August 2014 through August 2016, PCE concentrations in monitoring well WR-384A were less than the AWQS of 5 µg/l. The PCE concentration in this well in the August 2016 sampling event was 4.8 µg/l. In the August 2016 sampling event, PCE was detected at concentrations below the AWQS in wells WR-384A, WR-445A, WR-447A and WR-449A, with concentrations ranging between 2.0 µg/l and 4.8 µg/l, as shown on **Figure 6**.

There was one exceedance for TCE in the August 2016 sampling event. A TCE concentration of 8.9 µg/l was observed in monitoring well WR-384A, which is greater than the AWQS for TCE of 5 µg/l. The TCE concentrations in this well have been less than the AWQS from 2002 through 2013. However, groundwater samples obtained from 2014 through 2016 from well WR-384A have identified TCE concentrations above the AWQS. COT-EGSD will continue to evaluate the TCE concentrations in well WR-384A. TCE was not detected in any of the remaining monitoring wells in the August 2016 sampling event.

Other VOCs, such as chloroform, total trihalomethanes and dichlorodifluoromethane were detected in several of the wells. All of these compounds were detected at concentrations below their respective AWQS, as shown on **Table 3** and in **Appendix C**.

Nitrate

Nitrate concentrations exceeded the AWQS of 10 mg/l in the following monitoring wells during the August 2015 sampling event:

- WR-445A at 15.3 mg/l
- WR-447A at 26.6 mg/l
- WR-449A at 30.3 mg/l

Nitrate concentrations in the groundwater are presented on **Figure 9** and nitrate concentrations are summarized on **Table 4**. In general, nitrate concentrations in the groundwater appear to be consistent or decreasing from previous sampling events. The horizontal extent of the AWQS exceedances for nitrate in the groundwater from 2011 through 2016 is shown on **Figure 9**. Between 2003 and 2009, the highest nitrate concentration was detected at WR-446A, which is directly south and upgradient of the landfill (**Figure 9** and **Figure 10**). There may be an off-site source[4], as nitrate is typically not a landfill contaminant and because the highest concentrations have been historically detected to the south (upgradient) of the landfill. Therefore, COT-EGSD does not consider nitrate to be a contaminant of concern at this site.

Other Inorganic Compounds

Trend charts for select inorganic compounds analyzed at the Tumamoc Landfill are provided in **Appendix D**. There were no exceedances of the AWQS for those compounds having standards for any of the inorganic compounds. The detects for these compounds observed in the August 2016 sampling event were similar to previous sampling results.

In the 2015 sampling event, monitor well WR-448B exceeded the arsenic AWQS of 0.05 mg/l at 0.109 mg/l. In addition during the 2015 sampling event, elevated concentrations of sulfate, chloride, bromide, sodium, magnesium, iron, calcium, total dissolved solids, and alkalinity were observed at well WR-448B. The elevated inorganic compounds in WR-448B are likely naturally-occurring and related to suspended solids present in the well. As stated in Section 2.1 in this report, well WR-448B could not be sampled in the August 2016 sampling event due to erosion of the access road leading to the wells.

---

[4] Petersen, Nancy, Deputy Director of Environmental Services, Memo to Tumamoc Landfill Files, *RE: Tumamoc Landfill – Groundwater and Landfill Gas Monitoring Report for Second Half 2005 and First Half 2006*, July 10, 2006

2.2.1 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) analyses for the August 2016 sampling event included two trip blank samples and one duplicate sample. Analytical results for QA/QC samples are presented in the laboratory report in **Appendix C**.

Trip Blank Sample Analysis

There were no analytes detected in the two trip blank samples.

Duplicate Sample Analysis

The field sampling sheets provided in **Appendix B** document that no technical issues were encountered during groundwater sample collection. Both the original and duplicate samples were collected from a single bailer sample, no color or other visual appearances of the water were noted and the turbidity was 2.7 nephelometric turbidity units (NTUs).

A table listing the relative percent difference (RPD) for the original and duplicate groundwater samples is provided in **Appendix C.** All duplicate sample analyses were within 30% RPD of the original sample analyses except for iron in the samples collected from monitoring well WR-454A. Iron had a RPD of 128% in the samples collected from monitoring well WR-454A, with a concentration of 0.502 mg/l in the original sample and 0.11 mg/l in the duplicate sample.

The laboratory percent recoveries for surrogates, matrix spikes and controls were within laboratory quality assurance objectives for accuracy, except for the data qualifiers listed in the case narratives presented in **Appendix C**. All percent recoveries were within acceptable quality standards and would not likely affect data results.

2.3 Performance Monitoring Evaluation

Groundwater monitoring and sampling activities have been conducted at the Tumamoc Landfill site since 2002. Performance monitoring was implemented to evaluate the effectiveness of the earthen cap recently installed over the waste material at the landfill and the effects of natural attenuation in meeting the AWQS.

PCE analytical data obtained since 2002 from shallow aquifer monitoring wells WR-384A and WR-445A were statistically evaluated for contaminant trends using the Mann-Kendall test. The Mann-Kendall test is a procedure that is used to evaluate significant increases or decreases in contaminant concentrations over time. Monitoring wells WR-384A and WR-445A are located downgradient and upgradient, respectively, from the landfill and have historically shown variable

PCE concentrations. The results for the Mann-Kendall test for trend are summarized below:

Well ID	Type	No. of Events	PCE Trend
WR-384A	Shallow Screened	23	Decreasing
WR-445A	Shallow Screened	23	Decreasing

As shown above, the Mann-Kendall evaluation results indicate a decreasing trend, indicating that the PCE plume is largely stable with areas of declining concentrations.

Figure 11 shows the GSI Mann-Kendall Tool Kit PCE Trend Analysis results.

Similarly, a statistical trend analysis was performed at monitoring wells that have shown nitrate concentrations above the AWQS of 10 mg/l. The trend analysis included nitrate data obtained since May 2003 at shallow monitoring well WR-384A and deep monitoring wells WR-445A, WR-446A, WR-447A and WR-449A. The results for Mann-Kendall test for trend are summarized below:

Well ID	Type	No. of Events	Nitrate Trend
WR-384A	Shallow Screened	20	Stable
WR-445A	Deep Screened	20	Decreasing
WR-446A	Depp Screened	20	Decreasing
WR-447A	Deep Screened	20	Decreasing
WR-449A	Deep Screened	20	Decreasing

As shown above, the evaluation results indicate no trend for well WR-384A and decreasing nitrate concentration trends for the other monitoring wells.

Figure 12 shows the GSI Mann-Kendall Tool Kit Nitrate Trend Analysis results.

Results of the performance monitoring evaluation indicate that the observed PCE and nitrate concentrations are stable, decreasing and likely will not pose a threat to human health and the

environment. Therefore, considering the results of this evaluation, COT-EGSD will modify the groundwater monitoring and sampling activites from annually to once every three years. The next groundwater monitoring and sampling event will be performed in 2019.

3.0 METHANE GAS MONITORING

Landfill gas probes TU-1, TU-2, TU-3, TU-4, TU-5, TU-6, TU-7, TU-8, and TU-9 were monitored for CH_4, CO_2, and O_2 on a quarterly basis during the months of January, April, July, and October in 2016. These landfill gas probes are located around the perimeter of the Tumamoc Landfill. Methane was not detected in any of the probes during the four monitoring events in 2016. **Figure 2** provides the location of the gas probes and **Appendix E** provides the results for each monitoring event.

4.0 ANNUAL LANDFILL INSPECTION

On October 6, 2016, Engineering & Environmental Consultants, Inc. (EEC) performed the annual field inspection required by COT-EGSD for non-regulated closed landfills. The non-regulated closed landfills are inspected under a COT-EGSD policy in accordance with regulations that are applicable to the regulated landfill sites[5]. EEC reported that the central portion of the south access road has significant erosion due to storm water runoff. Significant erosion has also occurred over the central landfill cap near the main rock spillway and on areas along the north, west and south perimeter slopes of the landfill. These observations are currently being evaluated for potential repairs during 2017. A copy of EEC's October 2016 Inspection Report for the Tumamoc Landfill is provided in **Appendix F**.

5.0 CONCLUSIONS

- The direction of groundwater flow in the shallow and deep portions of the aquifer at the Tumamoc Landfill is from southwest to northeast. Hydraulic gradients indicate vertical flow between all shallow and deep well pairs is upward and the deep aquifer is under confined conditions. This data is consistent with previous monitoring events.

- PCE and TCE concentrations are relatively stable in all wells except for monitoring well WR-384A. PCE was detected at a concentration of 4.8 µg/l in downgradient monitoring well WR-384A, which is less than the AWQS of 5.0 µg/l for this compound. TCE exceeded the AWQS of 5.0 µg/l in well WR-384A at a concentration of 8.9 µg/l.

---

[5] *COT-ES Closed Landfills Inspection and Maintenance Reporting and Procedures, March 2011*

- Nitrate concentrations exceeded the AWQS of 10 mg/l at deep monitoring wells WR-445A, WR-447A and WR-449A, with the highest detect to the south (upgradient) of the landfill (**Figure 9**). Nitrate is not considered a contaminant of concern for the site.

- EEC performed an annual field inspection required for the non-regulated closed landfills in October of 2016. Significant erosion along the south access road, over the central landfill cap and on areas of the north, west and south perimeter slopes of the landfill were identified during the inspection. These areas of the Tumamoc Landfill are currently being evaluated for repairs during in 2017.

- Landfill gas monitoring will continue on a quarterly basis in 2016.

- The access road to monitoring wells WR-448A and WR-448B was impassable due to storm water erosion. Therefore, monitoring and sampling activities were not performed at these wells in 2016.

- The results of the performance monitoring evaluation indicate that the PCE plume is confined to monitoring well WR-384A and decreasing in concentrations.

- The results of the performance monitoring evaluation indicate that the nitrate plume is stable at well WR-384A. There are decreasing nitrate concentration trends at the other monitoring wells.

- As a result of the performance evaluation, groundwater monitoring and sampling activites will be modified from annually to once every three years. The next groundwater sampling event will be conducted in 2019.

TABLES

Table 1
Well Construction and Equipping Summary
Tumamoc Landfill

Well Name	ADWR Registration Number	Northing	Easting	Measuring Pt Elev. ** (ft)	Total Depth (ft)	Screen Interval (ft.)	Screen Designation	Casing Dia. (in.)	Casing Material	Well Completion
WR-384A	55-588649	441430.80	979168.46	2443.28	100	45-100	Shallow	5	Sch 80 PVC	3/28/02
WR-385A	55-588651	441912.36	978480.97	2437.55	211	140-210	Deep	5	Sch 80 PVC	4/12/02
WR-385B*	55-592004	441925.45	978475.23	2437.27	85	25-85	Shallow	5	Sch 80 PVC	4/12/02
WR-386A	55-588650	440694.59	978488.84	2450.55	55	28-54	Shallow	5	Sch 80 PVC	4/2/02
WR-445A	55-593924	440268.08	979268.48	2486.01	160	44-160	Long	5	Sch 80 PVC	4/9/03
WR-446A	55-593925	440070.30	978831.59	2473.82	200	40-199	Long	5	Sch 80 PVC	8/1/03
WR-447A	55-593926	440364.81	979904.55	2475.01	198	40-198	Long	5	Sch 80 PVC	7/28/03
WR-448A	55-593921	442189.96	979007.19	2431.39	230	110-230	Deep	5	Sch 80 PVC	4/15/03
WR-448B	55-593922	442171.51	979001.79	2431.80	95	36-92	Shallow	5	Sch 80 PVC	4/15/03
WR-449A	55-593923	440835.13	979447.74	2473.33	200	40-200	Long	5	Sch 80 PVC	4/10/03
WR-454A	55-204074	440035.17	977328.65	2469.85	240	140-240	Deep	5	Sch 80 PVC	8/13/04
WR-454B	55-204075	440030.43	977317.35	2469.76	105	20-100	Shallow	5	Sch 80 PVC	8/17/04
WR-455A	55-204076	439011.59	977176.55	2485.60	240	120-240	Deep	5	Sch 80 PVC	8/25/04
WR-455B	55-204077	439031.78	977181.90	2485.81	100	30-100	Shallow	5	Sch 80 PVC	8/27/04

LANDFILL GAS MONITORING PROBES					
Probe Name	ADWR Registration Number	Northing	Easting	Probe Depths (ft.)	Well Owner
TU-1	NA	440060.00	978410.00	10, 25	COT
TU-2	NA	440053.00	978605.00	10, 25	COT
TU-3	NA	440055.00	978795.00	10, 30	COT
TU-4	NA	440067.00	979013.00	10, 30	COT
TU-5	NA	440073.00	979248.00	10, 35	COT
TU-6	NA	440091.00	979403.00	10, 35	COT
TU-7	NA	440119.00	979602.00	10, 35	COT
TU-8	NA	440138.00	979939.00	10, 25	COT
TU-9	NA	441244.00	977209.00	10, 25	COT

*WR-358B was rebuilt in the same borehole 3/03 due to a broken bottom cap during the original well installation in 4/02.
** Northing, easting, and elevation is measuring point elevation which is the top of casing notch on the north side.

Table 2
Water Table Elevations
Tumamoc Landfill

Well	Screen Designation	Date	2016 DTW (ft)	Measuring Point Elevation (ft. a.m.s.l.)	2016 WTE (ft a.m.s.l.)
WR-384A	shallow	8/31/2016	55.55	2443.28	2387.73
WR-385A	deep	8/31/2016	45.99	2437.55	2391.56
WR-385B	shallow	8/31/2016	47.24	2437.27	2390.03
WR-386A	shallow	8/31/2016	*Dry*	2450.55	
WR-445A	long	8/31/2016	*NM*	2486.01	
WR-446A	long	8/30/2016	42.59	2473.82	2431.23
WR-447A	long	8/30/2016	45.30	2475.01	2429.71
WR-448A	deep	--	*NM*	2431.39	
WR-448B	shallow	--	*NM*	2431.80	
WR-449A	long	8/31/2016	58.51	2473.33	2414.82
WR-454A	deep	8/30/2016	24.21	2469.85	2445.64
WR-454B	shallow	8/30/2016	13.55	2469.76	2456.21
WR-455A	deep	8/30/2016	21.15	2485.60	2464.45
WR-455B	shallow	8/30/2016	22.50	2485.81	2463.31

Notes:
ft = feet
ft amsl = feet above mean sea level
DTW = depth to water.
Measuring Point Elevation = a chiselled notch on top of casing. In NAVD 88, feet above mean sea level.
WTE = water table elevation
NM = Not Measured

Table 3
Selected VOCs (ug/L) for Groundwater Monitor Wells
Tumamoc Landfill

			Analytes (ug/L)				
Well Name	Note	Date	PCE	TCE	*cis*-1,2-DCE	Vinyl Chloride	Dichlorodifluoro-methane
WR-384A		5/9/2002	31.0	2.5	2.9	<0.50	1.0
WR-384A	DL	5/9/2002	31.0	2.3	2.9	<0.50	2.3
WR-384A		7/25/2002	21.0	1.9	3.0	<0.50	<2.0
WR-384A		10/8/2002	40.0	3.3	4.1	<0.50	<2.0
WR-384A		2/11/2003	31.0	2.7	3.1	<0.50	<2.0
WR-384A		5/20/2003	25.0	2.4	3.0	<0.50	<2.0
WR-384A		8/11/2003	23.0	2.0	1.8	<0.50	<2.0
WR-384A		10/7/2003	19.0	1.7	1.5	<0.50	<2.0
WR-384A		2/10/2004	24.0	2.0	2.3	<0.50	<2.0
WR-384A		8/17/2004	27.0	2.4	2.5	<0.50	<2.0
WR-384A		2/8/2005	18.0	1.5	1.5	<0.50	<2.0
WR-384A		8/16/2005	20.0	1.6	1.7	<0.50	<2.0
WR-384A		2/14/2006	8.4	<0.05	<0.50	<0.50	<2.0
WR-384A		8/29/2006	6.3	0.5	<0.50	<0.50	<2.0
WR-384A		2/6/2007	11.0	1.0	0.6	<0.50	<2.0
WR-384A		8/15/2007	4.8	<0.50	<0.50	<0.50	<2.0
WR-384A		8/13/2008	3.4	<0.50	<0.50	<0.50	<0.50
WR-384A	B	9/23/2009	5.9	<0.50	<0.50	<0.50	<0.50
WR-384A	B	8/9/2010	4.4	<0.50	<0.50	<0.50	<0.50
WR-384A	B	8/17/2011	5.3	<0.50	<0.50	<0.50	<0.50
WR-384A	B, DL	8/17/2011	5.4	0.5	<0.50	<0.50	<0.50
WR-384A	B	8/16/2012	6.8	0.9	<0.50	<0.50	<0.50
WR-384A	B	9/18/2013	9.4	1.6	<0.50	<0.50	<0.50
WR-384A	B,D	9/18/2013	9.5	1.7	<0.50	<0.50	<0.50
WR-384A	B	8/27/2014	<0.50	7.8	<0.50	<0.50	<0.50
WR-384A	B,D	8/27/2014	<0.50	7.9	<0.50	<0.50	<0.50
WR-384A	B	3/9/2015	<0.50	9.1	<1	<1	<1
WR-384A	B	8/26/2015	2.7	8.4	<0.50	<0.50	<0.50
WR-384A	B,D	8/26/2015	2.9	9.3	<0.50	<0.50	<0.50
WR-384A	B,D	8/31/2016	4.8	8.9	<0.50	<0.50	<0.50
WR-385A		5/9/2002	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	DL	5/9/2002	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A		7/25/2002	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		10/8/2002	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		2/11/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		5/23/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		8/14/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		2/11/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		8/18/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		2/7/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		8/8/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A	D	8/8/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		2/9/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A	D	2/9/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		9/5/2006	<0.5	<0.50	<0.50	<0.50	<2.0
WR-385A	D	9/5/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		2/12/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		8/22/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385A		8/11/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A		9/24/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	B	8/9/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	B,D	8/9/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	B	8/17/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	B	8/16/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	B	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50

Table 3
Selected VOCs (ug/L) for Groundwater Monitor Wells
Tumamoc Landfill

			Analytes (ug/L)				
Well Name	**Note**	**Date**	**PCE**	**TCE**	***cis*-1,2-DCE**	**Vinyl Chloride**	**Dichlorodifluoro-methane**
WR-385A	B	8/27/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	B	8/26/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385A	B	8/31/2016	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B		5/9/2002	1.0	1.8	0.8	<0.50	<0.50
WR-385B	DL	5/9/2002	1.0	1.8	0.8	<0.50	<0.50
WR-385B		7/25/2002	0.7	0.8	<0.50	<0.50	<2.0
WR-385B		10/8/2002	2.6	3.0	1.2	<0.50	<2.0
WR-385B		2/11/2003	3.4	4.7	2.1	<0.50	<2.0
WR-385B		5/20/2003	0.5	0.7	<0.50	<0.50	<2.0
WR-385B		8/13/2003	<0.50	0.7	<0.50	<0.50	<2.0
WR-385B		2/10/2004	0.7	1.0	<0.50	<0.50	<2.0
WR-385B		8/17/2004	0.6	0.7	<0.50	<0.50	<2.0
WR-385B		2/8/2005	0.6	0.7	<0.50	<0.50	<2.0
WR-385B		8/16/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385B		2/14/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385B		8/29/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385B		2/6/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-385B		8/15/2007	0.7	0.5	<0.50	<0.50	<2.0
WR-385B		8/13/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	9/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B, D	9/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	8/9/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	8/17/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	8/16/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	8/27/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	8/26/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-385B	B	8/31/2016	<0.50	<0.50	<0.50	<0.50	<0.50
WR-386A		5/9/2002	0.5	<0.50	<0.50	<0.50	<0.50
WR-386A	DL	5/9/2002	<0.50	<0.50	<0.50	<0.50	<0.50
WR-386A		7/25/2002	0.5	<0.50	<0.50	<0.50	<2.0
WR-386A		10/8/2002	0.6	<0.50	<0.50	<0.50	<2.0
WR-386A		2/11/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		5/22/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		8/13/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		2/11/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		8/19/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		2/10/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		8/16/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		2/9/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		8/31/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		2/8/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		8/21/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-386A		8/7/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-386A	B	10/22/2009	1.5	<0.50	<0.50	<0.50	<0.50
WR-386A	B	8/9/2010	1.1	<0.50	<0.50	<0.50	<0.50
WR-386A	B	8/17/2011	1.2	<0.50	<0.50	<0.50	<0.50
WR-386A	B	8/16/2012	1.3	<0.50	<0.50	<0.50	<0.50
WR-386A	B	9/18/2013	1.3	<0.50	<0.50	<0.50	<0.50
WR-445A		4/9/2003*	**8.7**	1.3	0.8	<0.50	3.2
WR-445A		5/21/2003	**9.9**	1.5	1.0	<0.50	4.0
WR-445A		8/12/2003	**11.0**	1.5	0.8	<0.50	4.4
WR-445A		10/8/2003	**11.0**	1.4	0.7	<0.50	5.1

Table 3
Selected VOCs (ug/L) for Groundwater Monitor Wells
Tumamoc Landfill

			Analytes (ug/L)				
Well Name	Note	Date	PCE	TCE	*cis*-1,2-DCE	Vinyl Chloride	Dichlorodifluoro-methane
WR-445A		2/11/2004	9.5	1.6	1.0	<0.50	3.4
WR-445A		8/19/2004	7.4	1.3	0.9	<0.50	<2.0
WR-445A		2/10/2005	8.5	1.5	1.1	<0.50	3.0
WR-445A		8/15/2005	8.6	1.1	0.7	<0.50	2.6
WR-445A	D	8/15/2005	8.2	1.1	0.7	<0.50	2.6
WR-445A		2/14/2006	8.4	1.2	0.8	<0.50	3.0
WR-445A	D	2/15/2006	8.5	1.2	0.8	<0.50	2.9
WR-445A		9/6/2006	6.9	1.1	0.8	<0.50	2.0
WR-445A		2/13/2007	8.7	1.3	0.7	<0.50	2.1
WR-445A		8/23/2007	7.9	1.2	0.6	<0.50	<2.0
WR-445A		8/14/2008	9.4	1.4	0.8	<0.50	2.7
WR-445A		9/28/2009	8.3	1.4	0.8	<0.50	2.7
WR-445A	B	8/9/2010	3.1	<0.5	<0.5	<0.5	<0.5
WR-445A	B	8/17/2011	3.5	<0.5	<0.5	<0.5	<0.5
WR-445A	B	8/15/2012	3.4	<0.5	<0.5	<0.5	0.5
WR-445A	B	9/18/2013	4.2	<0.5	<0.5	<0.5	0.7
WR-445A	B	8/27/2014	4.1	<0.5	<0.5	<0.5	0.5
WR-445A	B	8/26/2015	3.1	<0.50	<0.50	<0.50	<0.50
WR-445A	B	8/31/2016	3.4	<0.50	<0.50	<0.50	0.5
WR-446A		8/13/2003	1.0	<0.50	<0.50	<0.50	<2.0
WR-446A		10/6/2003	0.8	<0.50	<0.50	<0.50	<2.0
WR-446A		2/12/2004	0.6	<0.50	<0.50	<0.50	<2.0
WR-446A		5/17/2004	0.6	<0.50	<0.50	<0.50	<2.0
WR-446A		8/16/2004	0.6	<0.50	<0.50	<0.50	<2.0
WR-446A		2/7/2005	0.7	<0.50	<0.50	<0.50	<2.0
WR-446A		8/8/2005	0.6	<0.50	<0.50	<0.50	<2.0
WR-446A		2/13/2006	0.5	<0.50	<0.50	<0.50	<2.0
WR-446A	D	2/13/2006	0.5	<0.50	<0.50	<0.50	<2.0
WR-446A		9/5/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-446A		2/12/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-446A		8/22/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-446A	D	8/22/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-446A		8/11/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-446A		9/24/2009	0.5	<0.50	<0.50	<0.50	<0.50
WR-446A	B	8/10/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-446A	B	8/18/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-446A	B	8/15/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-446A	B	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-446A	B	8/27/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-446A	B	8/26/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-446A	B	8/30/2016	<0.50	<0.50	<0.50	<0.50	<0.50
WR-447A		8/13/2003	1.4	<0.50	<0.50	<0.50	<2.0
WR-447A		10/6/2003	1.8	<0.50	<0.50	<0.50	<2.0
WR-447A		2/12/2004	1.7	<0.50	<0.50	<0.50	<2.0
WR-447A		5/17/2004	1.8	<0.50	<0.50	<0.50	<2.0
WR-447A		8/16/2004	1.5	<0.50	<0.50	<0.50	<2.0
WR-447A		2/9/2005	1.6	<0.50	<0.50	<0.50	<2.0
WR-447A		8/8/2005	1.7	<0.50	<0.50	<0.50	<2.0
WR-447A		2/13/2006	1.6	<0.50	<0.50	<0.50	<2.0
WR-447A		9/6/2006	1.6	<0.50	<0.50	<0.50	<2.0
WR-447A		2/13/2007	1.9	<0.50	<0.50	<0.50	<2.0
WR-447A		8/23/2007	2.0	<0.50	<0.50	<0.50	<2.0
WR-447A		8/14/2008	1.9	<0.50	<0.50	<0.50	0.5
WR-447A		9/28/2009	2.0	<0.50	<0.50	<0.50	0.8

Table 3
Selected VOCs (ug/L) for Groundwater Monitor Wells
Tumamoc Landfill

			Analytes (ug/L)				
Well Name	Note	Date	PCE	TCE	*cis*-1,2-DCE	Vinyl Chloride	Dichlorodifluoro-methane
WR-447A		9/28/2009	1.9	<0.50	<0.50	<0.50	0.8
WR-447A	B	8/10/2010	1.9	<0.50	<0.50	<0.50	0.6
WR-447A	B	8/18/2011	1.8	<0.50	<0.50	<0.50	0.6
WR-447A	B	8/15/2012	1.9	<0.50	<0.50	<0.50	0.5
WR-447A	B	9/17/2013	1.7	<0.50	<0.50	<0.50	0.6
WR-447A	B	8/27/2014	1.9	<0.50	<0.50	<0.50	0.5
WR-447A	B	8/26/2015	1.9	<0.50	<0.50	<0.50	0.5
WR-447A	B	8/30/2016	2.0	<0.50	<0.50	<0.50	0.5
WR-448A		4/21/2003*	0.7	<0.50	<0.50	<0.50	<2.0
WR-448A		5/21/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		8/12/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		10/6/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		2/10/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		8/16/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		2/7/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		8/11/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A	D	8/11/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		2/9/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		9/5/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		2/12/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		2/12/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		8/22/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448A		8/11/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A		9/24/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A	B	8/11/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A	B	2/1/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A	B	8/17/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A	B	8/16/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A	B	9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A	B	8/28/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448A	B	8/27/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B		4/21/2003*	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		5/20/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		8/11/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		10/8/2003	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		2/10/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		8/17/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		2/8/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		8/16/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		2/14/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		8/29/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B	D	8/29/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		2/6/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		8/15/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-448B		8/13/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B		8/13/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B	B	9/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B	B	3/30/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B	B	8/18/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B	B	8/16/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B	B	9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B	B	8/27/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-448B	B	8/27/2015	<0.50	<0.50	<0.50	<0.50	<0.50

Table 3
Selected VOCs (ug/L) for Groundwater Monitor Wells
Tumamoc Landfill

			Analytes (ug/L)				
Well Name	Note	Date	PCE	TCE	*cis*-1,2-DCE	Vinyl Chloride	Dichlorodifluoro-methane
WR-449A		4/10/2003*	4.3	0.54	<0.50	<0.50	<2.0
WR-449A		5/21/2003	3.5	<0.50	<0.50	<0.50	<2.0
WR-449A		8/12/2003	4.3	<0.50	<0.50	<0.50	<2.0
WR-449A		10/7/2003	**5.0**	0.50	<0.50	<0.50	<2.0
WR-449A		2/11/2004	4.8	0.54	<0.50	<0.50	<2.0
WR-449A		8/18/2004	4.4	0.51	<0.50	<0.50	<2.0
WR-449A		2/9/2005	4.6	0.60	<0.50	<0.50	<2.0
WR-449A		8/11/2005	4.9	0.50	<0.50	<0.50	<2.0
WR-449A		2/13/2006	4.3	<0.50	<0.50	<0.50	<2.0
WR-449A		9/6/2006	4.0	<0.50	<0.50	<0.50	<2.0
WR-449A		2/13/2007	4.4	<0.50	<0.50	<0.50	<2.0
WR-449A		8/23/2007	3.8	<0.50	<0.50	<0.50	<2.0
WR-449A		8/14/2008	4.9	0.50	<0.50	<0.50	0.9
WR-449A		9/28/2009	4.2	<0.50	<0.50	<0.50	0.8
WR-449A	HS-60'	11/23/2009	**5.1**	0.59	NA	NA	NA
WR-449A	HS-97'	11/23/2009	**5.2**	0.60	NA	NA	NA
WR-449A	HS-186'	11/23/2009	4.8	0.52	NA	NA	NA
WR-449A	B	8/11/2010	**5.0**	0.50	<0.50	<0.50	1.7
WR-449A	B	8/17/2011	4.5	<0.50	<0.50	<0.50	1.8
WR-449A	B	8/16/2012	4.2	<0.50	<0.50	<0.50	1.1
WR-449A	B	9/17/2013	4.1	0.5	<0.50	<0.50	1.3
WR-449A	B	8/28/2014	4.6	<0.50	<0.50	<0.50	1.3
WR-449A	B	8/27/2015	4.2	<0.50	<0.50	<0.50	1.2
WR-449A	B	8/31/2016	3.8	<0.50	<0.50	<0.50	1.1
WR-454A		10/13/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		2/14/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		8/15/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		2/7/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		8/28/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		2/5/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		2/5/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		8/15/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A	D	8/15/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454A		8/12/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A		9/29/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B	8/9/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B	8/18/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B	8/15/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B	9/18/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B	8/28/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B	8/27/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B	8/30/2016	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454A	B, D	8/30/2016	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B		10/11/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B		2/15/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B		8/16/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B	D	8/16/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B		2/7/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B		8/31/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B		2/8/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B		8/20/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-454B		8/7/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	9/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	8/10/2010	<0.50	<0.50	<0.50	<0.50	<0.50

Table 3
Selected VOCs (ug/L) for Groundwater Monitor Wells
Tumamoc Landfill

			Analytes (ug/L)				
Well Name	**Note**	**Date**	**PCE**	**TCE**	***cis*-1,2-DCE**	**Vinyl Chloride**	**Dichlorodifluoro-methane**
WR-454B	B	8/18/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	8/15/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	8/15/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	8/28/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	8/27/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-454B	B	8/30/2016	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A		10/12/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A		2/15/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A		8/16/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A		2/7/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A	D	2/7/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A		8/31/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A		2/8/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A		8/20/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455A		8/7/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	9/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	8/10/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	8/18/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	8/15/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	8/28/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	8/27/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455A	B	8/30/2016	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B		10/11/2004	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455B		2/15/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455B		8/16/2005	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455B		2/7/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455B		8/31/2006	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455B		2/8/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455B		8/21/2007	<0.50	<0.50	<0.50	<0.50	<2.0
WR-455B		8/7/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B		8/7/2008	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	9/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	8/10/2010	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	8/18/2011	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	8/15/2012	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	9/17/2013	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	8/28/2014	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	8/27/2015	<0.50	<0.50	<0.50	<0.50	<0.50
WR-455B	B	8/30/2016	<0.50	<0.50	<0.50	<0.50	<0.50
AWQS			**5.0**	**5.0**	**70.0**	**2.0**	**none**

D = duplicate sample; DL = duplicate sample sent to different lab. B = no purge, bailed sample.

* Sample collected during well development.

BOLD and yellow highlighted values are above the aquifer water quality standard.

HS = Hydrasleeve discrete depth samples with depth in feet below ground surface following well name.

Table 4
Selected Inorganics (mg/L) for Groundwater Monitor Wells
Tumamoc Landfill

Well	Notes	Date	Calcium	Sodium	Magnesium	Potassium	Nitrate	Nitrite	Bicarbonate Alkalinity	Fluoride	Sulfate	Chloride	Bromide	Total Phosphorus	Hardness ($CaCO_3$)	Total Dissolved Solids	Total Suspended Solids	Total Organic Carbon	Aluminum	Chromium	Iron	Arsenic	Lead
Seep		8/8/2002	44	85	9.8	3.0	2.4	<0.020	170	0.55	58	65	NA	<0.050	150	390	33	<1.0	0.5	<0.010	0.29	0.0080	<0.0030
WR-384A		5/9/2002	117	1950	83.0	7.4	NA	NA	554	NA	NA	NA	0.22	NA	636	5440	939	2.8	19.0	NA	9.5	NA	NA
WR-384A	DL	5/9/2002	130	2000	92.0	22.0	7.3	0.52	570	0.54	400	NA	0.37	2.1	710	5300	510	<25	40.0	<0.010	22	0.023	0.031
WR-384A		7/25/2002	100	1600	81.0	11.0	8.0	<0.020	590	0.56	340	NA	0.087	0.066	590	5600	44	12.0	0.5	<0.010	0.26	0.015	<0.0030
WR-384A		10/8/2002	110	1800	81.0	11.0	9.1	<0.020	560	<0.50	320	2600	0.083	0.061	610	5600	11	7.2	0.4	<0.010	NA	0.01	<0.0030
WR-384A		2/11/2003	120	1900	86.0	11.0	8.1	<0.020	540	<2.5	350	2700	20	0.051	650	5700	26	6.0	0.7	<0.010	0.43	0.011	<0.0030
WR-384A		5/20/2003	120	2000	82.0	11.0	8.2	<0.020	530	<2.5	380	2800	23	0.057	630	5900	40	5.3	0.1	<0.010	<0.10	0.0089	<0.0030
WR-384A		8/11/2003	120	1600	81.0	11.0	8.1	<0.020	490	<0.50	390	2800	NA	<0.050	620	6100	26	4.8	0.3	<0.010	0.13	0.0057	0.0038
WR-384A		10/7/2003	120	1800	87.0	11.0	8.4	<0.020	510	<0.50	440	2800	21	0.059	660	6100	26	4.2	0.6	<0.010	0.37	0.01	<0.0030
WR-384A		2/10/2004	130	1700	92.0	13.0	8.1	<0.0020	490	<0.50	410	2800	7.3	0.0064	710	6100	53	3.2	0.5	<0.010	0.19	0.0092	0.006
WR-384A		8/17/2004	150	2000	120.0	12.0	8.4	0.0074	480	0.70	380	3400	24	<0.050	860	6800	78	3.4	0.7	<0.010	0.27	0.0079	<0.0030
WR-384A		2/8/2005	170	2100	120.0	15.0	7.5	0.0065	470	<0.50	490	3300	25	<0.050	<1000	6900	25	3.6	0.3	<0.010	<0.10	0.008	<0.0030
WR-384A		8/16/2005	190	2200	130.0	14.0	9.4	0.026	460	<1.0	630	3900	24	0.16	1000	7600	<10	3.4	0.2	<0.010	<0.10	<0.010	<0.0030
WR-384A		2/14/2006	170	1900	110.0	15.0	**12.0**	<0.020	430	<1.0	780	2600	17	0.054	870	5900	<10	1.8	0.4	<0.010	<0.10	0.005	<0.0100
WR-384A		8/29/2006	NA	NA	NA	NA	**16.0**	<0.020	NA	0.67	740	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-384A		2/6/2007	83	1200	50.0	7.9	**13.0**	<0.020	410	0.69	670	2000	13	0.17	410	11000	<10	<1.0	0.2	<0.010	<0.10	0.0165	<0.004
WR-384A		8/15/2007	NA	NA	NA	NA	**15.0**	0.018	NA	1.00	770	1100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-384A		8/13/2008	NA	NA	NA	NA	**14.0**	<0.1	NA	0.73	589	1080	7.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-384A	B	9/23/2009	NA	NA	NA	NA	**25.0**	<10	NA	1.30	1440	1850	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-384A	B	8/9/2010	147	2610	110	5.8	**19.0**	<0.25	638	1.00	1720	2600	20	NA	NA	7680	NA	1.24	NA	NA	0.038	0.0059	<0.002
WR-384A	B	8/17/2011	109	1960	72	4	**12.0**	<1.0	523	1.90	1290	1980	15	NA	NA	5850	NA	0.99	NA	NA	2.5	0.012	0.042
WR-384A	B,DL	8/17/2011	118	1830	75.4	6.94	**10.5**	<0.02	490	<0.5	590	916	13.1	NA	NA	4540	NA	<0.5	NA	NA	4.39	0.0161	0.0249
WR-384A	B	8/16/2012	349	2210	135	5.5	<0.25	<1	1460	**15.00**	<5	3200	8.6	NA	NA	7110	NA	98	NA	NA	2.6	**0.14**	<0.005
WR-384A	B	9/18/2013	65	1180	34	3	<0.25	<.1	535	1.60	575	1170	6.8	NA	NA	3490	NA	1.71	NA	NA	2.5	0.027	<0.002
WR-384A	B,D	9/18/2013	65	1190	34	3	<0.25	<.1	548	1.60	579	1180	7.2	NA	NA	3500	NA	1.77	NA	NA	3.1	0.034	<0.002
WR-384A	B	8/27/2014	66.4	1260	39.3	4.83	<0.25	<.1	585	1.52	568	1300	8.44	NA	NA	3660	NA	1.63	NA	NA	1.07	0.0176	<0.002
WR-384A	B,D	8/27/2014	66.7	1270	39.2	3.06	<0.25	<.1	595	1.53	570	1300	8.47	NA	NA	3780	NA	1.31	NA	NA	1.24	0.0178	<0.002
WR-384A	B	9/1/2015	69.6	1290	40.9	4.27	<0.25	<0.1	557	1.42	615	1460	9.36	NA	NA	3980	NA	1.23	NA	NA	4.74	0.0267	<0.002
WR-384A	B	9/1/2015	70.5	1290	41.3	4.27	<0.25	<0.1	579	1.41	609	1460	9.14	NA	NA	3890	NA	1.53	NA	NA	3.38	0.0201	<0.002
WR-384A	B	8/31/2016	71.9	1360	42.8	5.99	<0.25	<0.1	532	1.3	637	1510	9.8	NA	NA	3950	NA	0.82	NA	NA	5.57	0.0309	<0.002
WR-385A		5/9/2002	82	548	12.0	5.3	NA	NA	144	NA	NA	NA	0.33	NA	254	1660	592	6.5	15.0	NA	13	NA	NA
WR-385A	DL	5/9/2002	45	430	7.3	8.5	2.4	0.4	89	1.20	440	NA	0.18	0.56	140	1600	390	7.7	7.2	<0.010	6.1	0.012	0.014
WR-385A		7/25/2002	24	430	5.1	3.9	2.8	0.16	150	0.92	600	NA	0.047	<0.050	81	1600	23	18.0	0.5	<0.010	0.17	0.0091	<0.0030
WR-385A		10/8/2002	25	480	5.1	4.1	2.9	0.17	140	0.57	420	380	0.049	<0.050	83	1600	59	<1.0	2.5	<0.010	NA	0.0046	<0.0030
WR-385A		2/11/2003	28	450	5.8	4.3	2.2	0.24	140	<2.5	530	470	2.8	0.056	94	1600	30	<1.0	1.6	<0.010	0.55	0.0049	0.0031
WR-385A		5/23/2003	40	540	7.1	6.9	2.8	<0.020	150	0.65	410	380	3.8	0.33	130	1600	220	<1.0	8.2	<0.010	4.9	0.0094	0.013
WR-385A		2/11/2004	29	520	5.2	4.9	3.4	0.14	130	0.56	460	440	3.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385A		8/18/2004	27	480	5.1	3.8	3.0	0.14	130	0.62	440	410	3.3	<0.050	88	1600	<10	<1.0	0.3	<0.010	0.17	0.0047	<0.0030
WR-385A		2/7/2005	28	540	5.2	4.5	2.1	0.12	130	0.72	450	410	3.5	<0.050	92	1600	<10	<1.0	0.2	<0.010	<0.10	0.006	<0.0030
WR-385A		8/8/2005	28	550	5.2	3.6	2.3	0.15	120	0.81	510	480	3.3	0.2	92	1600	<10	<1.0	0.2	<0.010	<0.10	0.0048	<0.0030
WR-385A	D	8/8/2005	28	540	5.1	3.5	2.3	0.15	130	0.79	510	480	3.2	<0.050	92	1600	<10	<1.0	0.2	<0.010	<0.10	0.0051	<0.0030
WR-385A		2/9/2006	30	490	5.5	4.5	2.2	0.14	120	0.77	470	450	3.7	<0.050	97	1700	<10	<1.0	0.3	<0.010	<0.10	0.0054	<0.0020
WR-385A	D	2/9/2006	30	520	5.5	4.9	2.2	0.14	140	0.76	450	430	3.6	<0.050	98	1700	<10	<1.0	0.1	<0.010	<0.10	0.0052	<0.0020
WR-385A		6/5/2006	NA	NA	NA	NA	2.8	0.15	NA	0.75	470	760	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385A	D	6/5/2006	NA	NA	NA	NA	2.8	0.16	NA	0.77	500	480	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 4
Selected Inorganics (mg/L) for Groundwater Monitor Wells
Tumamoc Landfill

Well	Notes	Date	Calcium	Sodium	Magnesium	Potassium	Nitrate	Nitrite	Bicarbonate Alkalinity	Fluoride	Sulfate	Chloride	Bromide	Total Phosphorus	Hardness ($CaCO_3$)	Total Dissolved Solids	Total Suspended Solids	Total Organic Carbon	Aluminum	Chromium	Iron	Arsenic	Lead
WR-385A		2/12/2007	29	440	5.1	5.1	2.2	0.18	120	0.74	500	470	3.7	<0.050	94	1700	<10	<1.0	<0.1	<0.01	0.2	0.0066	<0.0020
WR-385A		8/22/2007	NA	NA	NA	NA	2.2	0.17	NA	0.76	480	480	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385A		8/11/2008	NA	NA	NA	NA	2.4	0.13	NA	0.74	487	471	3.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385A		9/24/2009	NA	NA	NA	NA	2.6	0.18	NA	0.78	515	490	3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385A	B	8/9/2010	32	639	6.2	2.5	0.6	<0.1	101	0.86	520	528	4.4	NA	NA	1770	NA	1.22	NA	NA	0.38	0.0048	<0.002
WR-385A	B,D	8/9/2010	32	642	6.2	2.4	0.5	<0.1	100	0.87	518	527	4.3	NA	NA	1780	NA	1.28	NA	NA	0.37	0.0045	<0.002
WR-385A	B	8/17/2011	35	555	6.7	2.5	1.1	<0.1	99	0.97	515	542	4.5	NA	NA	1820	NA	0.41	NA	NA	<0.02	0.0064	<0.002
WR-385A	B	8/16/2012	34	625	6.3	2.3	1.3	<0.1	95	0.98	538	556	4.5	NA	NA	1820	NA	0.6	NA	NA	<0.02	0.0078	<0.001
WR-385A	B	9/18/2013	34	603	6.4	2.1	1.6	<0.1	92	0.84	559	575	4.5	NA	NA	1800	NA	0.35	NA	NA	<0.02	0.0087	<0.001
WR-385A	B	8/27/2014	33.4	629	6.62	2.15	1.6	<0.1	89.9	0.82	511	537	4.43	NA	NA	1840	NA	<0.25	NA	NA	<0.1	0.00841	0.00157
WR-385A	B	9/1/2015	33.7	605	6.3	2.65	1.57	<0.1	92.9	0.812	546	577	4.5	NA	NA	1800	NA	0.42	NA	NA	0.0352	0.00839	<0.001
WR-385A	B	8/31/2016	33.5	617	6.17	3.7	1.59	<0.1	102	0.831	513	542	4.5	NA	NA	1820	NA	0.32	NA	NA	<0.02	0.00979	<0.001
WR-385B		5/9/2002	66	482	<0.5	6.0	NA	NA	439	NA	NA	NA	0.11	NA	NA	1340	110	2.7	1.6	0.062	0.35	0.0062	0.0022
WR-385B	DL	5/9/2002	77	440	<1.0	9.7	2.5	0.083	<20	2.20	270	NA	0.11	0.086	190	1400	180	3.1	1.7	0.069	0.41	0.006	<0.0030
WR-385B		7/25/2002	5.9	300	3.4	4.3	<0.50	0.29	130	3.30	260	NA	0.063	0.13	29	940	660	11.0	5.2	<0.010	4.4	0.056	0.0048
WR-385B		10/8/2002	8.9	500	5.2	5.3	3.3	<0.020	310	1.80	260	280	0.064	0.16	44	1500	230	2.2	4.5	<0.010	NA	0.037	<0.0030
WR-385B		2/11/2003	6.0	530	4.8	<2.0	4.8	<0.020	440	<0.5	220	430	2.6	0.11	35	1700	33	2.2	0.9	<0.010	0.44	0.033	<0.0030
WR-385B		5/20/2003	6.5	470	4.1	3.8	1.3	0.046	440	3.00	340	120	0.92	<0.050	33	1200	40	1.1	1.6	<0.010	0.76	0.019	<0.0030
WR-385B		2/10/2004	11	460	6.8	3.8	2.3	<0.020	540	1.80	320	160	1.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385B		8/17/2004	11	500	7.0	3.0	2.2	<0.020	530	1.80	350	190	1.6	0.069	56	1500	21	1.9	1.0	0.014	0.55	0.014	<0.0030
WR-385B		2/8/2005	12	590	8.0	5.2	2.0	0.02	590	2.10	380	160	1.4	0.13	64	1600	44	1.7	1.8	<0.010	0.84	0.015	<0.0030
WR-385B		8/16/2005	11	480	6.8	3.3	2.1	0.026	570	2.10	380	170	1.4	0.15	55	1500	20	<1.0	1.3	<0.010	0.49	0.015	0.0074
WR-385B		2/14/2006	10	460	6.1	3.6	1.7	0.067	560	1.80	280	90	0.71	0.067	51	1300	24	<1.0	1.3	<0.010	0.67	0.0165	<0.0020
WR-385B		8/29/2006	NA	NA	NA	NA	1.6	0.083	NA	1.90	250	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385B		2/6/2007	8.6	430	4.8	3.1	3.1	0.057	590	8.50	230	79	3.5	0.17	41	420	21	<1.0	1.8	<0.010	0.63	0.0162	<0.0020
WR-385B		8/15/2007	NA	NA	NA	NA	1.9	<0.010	NA	2.10	330	190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385B		8/13/2008	NA	NA	NA	NA	1.4	0.1	NA	1.80	246	64	0.52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385B	B	9/23/2009	NA	NA	NA	NA	1.6	<.1	NA	2.30	336	59	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385B	B, D	9/23/2009	NA	NA	NA	NA	1.6	<.1	NA	2.30	337	59	0.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-385B	B	8/9/2010	9	568	6.4	1.1	1.6	<.1	706	2.30	363	60	0.53	NA	NA	1480	NA	0.96	NA	NA	<0.02	0.014	<0.002
WR-385B	B	8/17/2011	9.7	487	6.7	1.2	1.6	<.1	696	2.20	371	54	0.47	NA	NA	1470	NA	0.64	NA	NA	<0.02	0.013	<0.002
WR-385B	B	8/16/2012	8.7	532	5.9	1.1	1.5	<.1	685	2.20	350	49	0.44	NA	NA	1410	NA	0.7	NA	NA	<0.02	0.015	<0.001
WR-385B	B	9/18/2013	8.6	534	6.2	1	1.5	<.1	687	2.30	338	42	0.35	NA	NA	1420	NA	0.53	NA	NA	<0.02	0.014	<0.001
WR-385B	B	8/27/2014	11.3	522	6.51	1.14	1.5	<.1	728	2.26	293	37.2	0.355	NA	NA	1360	NA	0.66	NA	NA	0.552	0.0148	0.00136
WR-385B	B	9/1/2015	8.8	506	5.6	1.35	1.3	<0.1	773	2.26	256	32.9	0.308	NA	NA	1310	NA	0.51	NA	NA	0.184	0.0146	<0.001
WR-385B	B	8/31/2016	8.48	476	5.02	1.94	1.52	<0.1	795	2.17	238	29.6	0.275	NA	NA	1250	NA	0.54	NA	NA	0.128	0.017	<0.001
WR-386A		5/9/2002	18	771	17.0	2.1	NA	NA	621	NA	NA	NA	0.19	NA	115	2150	2.8	4.9	<0.1	<0.02	0.04	0.011	NA
WR-386A	DL	5/9/2002	21	680	18.0	4.4	4.0	0.079	610	2.70	78	NA	0.17	0.11	130	2200	<10	6.2	0.1	<0.010	<0.10	0.01	0.013
WR-386A		7/25/2002	18	740	17.0	6.5	6.1	<0.020	780	3.60	120	NA	0.24	0.83	110	2400	850	21.0	8.2	0.01	5.7	0.042	0.008
WR-386A		10/8/2002	15	800	13.0	5.0	5.2	<0.020	760	2.50	69	740	0.16	0.32	92	2400	310	3.5	6.7	<0.010	NA	0.03	0.0059
WR-386A		2/11/2003	20	820	17.0	4.8	3.5	<0.020	670	2.80	95	1000	6.4	0.17	120	2500	86	3.3	2.3	<0.010	1.7	0.012	0.0062
WR-386A		5/22/2003	22	820	18.0	4.1	5.9	<0.020	480	<2.5	81	830	19	0.073	130	2400	<10	3.4	0.4	<0.010	1.1	0.0069	0.013
WR-386A		2/11/2004	22	820	18.0	5.2	3.6	<0.020	610	2.00	85	970	7.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-386A		8/19/2004	19	830	15.0	4.8	2.9	<0.020	590	1.60	87	890	6.3	0.12	110	2400	110	3.3	3.9	<0.010	2.4	0.013	<0.0030
WR-386A		2/10/2005	16	860	13.0	4.7	2.9	<0.020	690	3.20	100	830	7.0	0.10	96	2400	49	3.4	1.6	<0.010	1.0	0.022	<0.0030

Table 4
Selected Inorganics (mg/L) for Groundwater Monitor Wells
Tumamoc Landfill

Well	Notes	Date	Calcium	Sodium	Magnesium	Potassium	Nitrate	Nitrite	Bicarbonate Alkalinity	Fluoride	Sulfate	Chloride	Bromide	Total Phosphorus	Hardness ($CaCO_3$)	Total Dissolved Solids	Total Suspended Solids	Total Organic Carbon	Aluminum	Chromium	Iron	Arsenic	Lead
WR-386A		8/16/2005	16	750	13.0	4.7	2.7	<0.020	660	2.90	110	920	5.2	0.37	93	2400	75	2.8	3.2	<0.010	2.2	0.014	0.0033
WR-386A		2/9/2006	17	830	15.0	6.4	3.2	<0.020	740	2.90	120	710	5.7	0.24	110	2300	16	2.4	7.5	0.011	4.5	**0.193**	**0.0602**
WR-386A		8/31/2006	NA	NA	NA	NA	3.0	<0.020	NA	**4.30**	120	580	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-386A		2/8/2007	9.2	1500	8.0	3.2	2.7	<0.020	200	3.10	140	490	3.8	0.37	56	1800	25	2.5	0.5	<0.010	8.0	0.0381	0.0177
WR-386A		8/21/2007	NA	NA	NA	NA	2.6	<0.020	NA	3.20	140	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-386A		8/7/2008	NA	NA	NA	NA	2.9	<0.1	NA	3.40	133	502	3.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-386A	B	10/22/2009	NA	NA	NA	NA	1.9	<0.1	NA	3.60	154	607	4.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-386A	B	8/9/2010	12.0	979.0	13.0	1.8	2.0	<0.1	946.0	3.50	176	610	4.9	NA	NA	2460.0	NA	2.6	NA	NA	0.1	0.041	<0.002
WR-386A	B	8/17/2011	12.0	962.0	14.0	1.6	1.8	<0.1	1060.0	3.10	207	652	5.4	NA	NA	2580.0	NA	2.3	NA	NA	0.02	0.037	<0.002
WR-386A	B	8/16/2012	15.0	1010.0	16.0	1.9	1.3	<0.1	1040.0	3.00	236	623	5.3	NA	NA	2620.0	NA	2.6	NA	NA	0.03	0.039	<0.002
WR-386A	B	9/18/2013	16.0	986.0	17.0	2.6	<0.25	<0.1	1030.0	3.30	258	642	5.0	NA	NA	2620.0	NA	3.0	NA	NA	1.80	0.024	0.0025
WR-445A		5/21/2003	58	230	38.0	51.0	**31.0**	<0.020	230	0.70	90	220	2.7	0.06	300	1000	21	<1.0	<0.10	<0.010	<0.10	0.012	<0.0030
WR-445A		8/12/2003	52	170	34.0	46.0	**32.0**	<0.020	220	0.82	94	230	2.6	<0.050	270	1000	<10	<1.0	<0.10	<0.010	<0.10	0.012	<0.0030
WR-445A		10/8/2003	52	190	34.0	46.0	**30.0**	<0.020	230	0.84	120	260	2.7	<0.050	290	1000	<10	1.0	<0.10	<0.010	<0.10	0.012	0.0053
WR-445A		2/11/2004	63	200	40.0	52.0	**36.0**	<0.020	220	0.88	110	280	2.8	<0.050	320	1000	<10	<1.0	<0.10	<0.010	<0.10	0.014	0.0052
WR-445A		8/19/2004	53	190	34.0	50.0	**31.0**	<0.020	220	0.76	93	220	2.5	<0.050	270	1000	<10	1.7	0.1	<0.010	<0.10	0.0097	0.015
WR-445A		2/10/2005	61	200	38.0	54.0	**29.0**	<0.020	220	0.95	100	220	2.6	<0.050	310	950	<10	<1.0	<0.10	<0.010	<0.10	0.014	0.0061
WR-445A		8/15/2005	54	180	34.0	49.0	**28.0**	<0.020	220	1.10	120	210	2.2	0.2	280	1000	<10	<1.0	<0.10	<0.010	<0.10	0.0097	<0.0030
WR-445A	D	8/15/2005	56	180	35.0	49.0	**28.0**	<0.020	220	1.10	120	230	2.2	0.21	280	1000	<10	1.0	<0.10	<0.010	<0.10	0.0093	<0.0030
WR-445A		2/14/2006	60	200	39.0	58.0	**28.0**	<0.020	220	1.00	110	210	2.4	0.054	310	960	<10	<1.0	<0.10	<0.010	<0.10	0.0114	0.0027
WR-445A	D	2/14/2006	58	190	37.0	55.0	**32.0**	<0.020	220	1.00	110	210	2.4	0.073	300	950	<10	<1.0	0.2	<0.010	<0.10	0.0111	0.0038
WR-445A		9/6/2006	NA	NA	NA	NA	**31.0**	<0.020	NA	0.90	100	220	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-445A		2/13/2007	56	190	35.0	34.0	**25.0**	<0.020	230	0.90	99	200	2.3	<0.050	280	880	<10	<1.0	<0.10	<0.010	<0.10	0.0127	0.0027
WR-445A		8/23/2007	NA	NA	NA	NA	**25.0**	<0.020	NA	0.84	100	220	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-445A		8/14/2008	NA	NA	NA	NA	**28.0**	<0.1	NA	0.87	106	229	2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-445A		9/28/2009	NA	NA	NA	NA	**28.0**	<0.1	NA	0.98	107	221	2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-445A	B	8/9/2010	44	119	27	47	**15.0**	<0.1	201	1.21	94	114	1.1	NA	NA	680	NA	1.28	NA	NA	<0.02	0.016	<0.002
WR-445A	B	8/17/2011	40	105	24	42	**16.0**	<0.1	203	1.10	92	40	1.1	NA	NA	668	NA	0.83	NA	NA	<0.02	0.014	<0.002
WR-445A	B	8/15/2012	44	118	27	46	**15.0**	<0.1	204	1.10	90	108	1	NA	NA	660	NA	0.87	NA	NA	<0.02	0.016	<0.001
WR-445A	B	9/18/2013	42	118	26	47	**16.0**	<0.1	175	1.30	98	115	1	NA	NA	661	NA	0.77	NA	NA	<0.02	0.016	<0.001
WR-445A	B	8/27/2014	42.1	120	25.7	46.4	**15.2**	<0.1	223	1.12	89.8	108	1.02	NA	NA	684	NA	0.71	NA	NA	<0.1	0.0148	0.00114
WR-445A	B	9/1/2015	41.8	118	26.1	47.3	**14.5**	<0.1	220	1.09	90.1	113	1.02	NA	NA	658	NA	0.73	NA	NA	0.0208	0.0153	<0.001
WR-445A	B	8/31/2016	43.4	124	26.9	45.1	**15.3**	<0.1	225	1.07	92.7	111	1.01	NA	NA	680	NA	0.61	NA	NA	<0.02	0.0166	<0.001
WR-446A		8/13/2003	58	340	48.0	20.0	**48.0**	0.18	340	<5.0	180	310	3.3	NA	340	1500	<10	2.0	<.010	<0.010	<0.10	0.012	0.0096
WR-446A		10/6/2003	57	370	47.0	21.0	**44.0**	0.31	320	0.97	210	330	3.1	0.09	340	1500	<10	1.5	<0.10	<0.010	<0.10	0.017	0.0086
WR-446A		2/12/2004	72	420	58.0	26.0	**41.0**	0.029	320	0.69	260	410	3.4	NA	NA	1600	<10	<1.0	NA	NA	NA	NA	NA
WR-446A		5/17/2004	72	370	59.0	26.0	**47.0**	0.026	320	0.72	240	410	3.6	<0.050	420	1700	<10	1.4	<0.10	<0.010	<0.10	0.012	<0.0030
WR-446A		8/16/2004	80	410	66.0	27.0	**48.0**	0.045	350	0.70	250	370	3.3	<0.050	470	1700	<10	1.6	<0.10	<0.010	<0.10	0.0097	<0.0030
WR-446A		2/7/2005	79	420	63.0	26.0	**43.0**	<0.020	350	0.64	240	310	3.0	<0.050	460	1700	<10	1.8	<0.10	<0.010	<0.10	0.013	<0.0030
WR-446A		8/8/2005	72	380	57.0	23.0	**35.0**	<0.020	380	1.00	250	330	2.9	0.058	410	1600	<10	2.0	<0.10	<0.010	<0.10	0.012	0.0032
WR-446A		2/13/2006	76	400	60.0	28.0	**42.0**	<0.020	390	0.93	260	310	3.2	0.075	440	1600	<10	1.3	<0.10	<0.010	<0.10	0.01	0.0021
WR-446A	D	2/13/2006	75	390	59.0	28.0	**40.0**	<0.020	390	0.91	250	300	3.2	0.065	430	1600	<10	1.3	<0.10	<0.010	<0.10	0.0093	<0.0020
WR-446A		9/5/2006	NA	NA	NA	NA	**51.0**	<0.020	NA	0.89	270	380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-446A		2/12/2007	70	390	53.0	27.0	**41.0**	<0.020	340	0.86	230	290	3.0	<0.050	390	1500	<10	<1.0	<0.10	<0.010	<0.10	0.0128	<0.0020
WR-446A		8/22/2007	NA	NA	NA	NA	**38.0**	<0.010	NA	0.78	240	290	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 4
Selected Inorganics (mg/L) for Groundwater Monitor Wells
Tumamoc Landfill

Well	Notes	Date	Calcium	Sodium	Magnesium	Potassium	Nitrate	Nitrite	Bicarbonate Alkalinity	Fluoride	Sulfate	Chloride	Bromide	Total Phosphorus	Hardness ($CaCO_3$)	Total Dissolved Solids	Total Suspended Solids	Total Organic Carbon	Aluminum	Chromium	Iron	Arsenic	Lead
WR-446A	D	8/22/2007	NA	NA	NA	NA	**38.0**	<0.010	NA	0.86	250	340	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-446A		8/11/2008	NA	NA	NA	NA	**32.0**	<0.1	NA	0.89	244	287	2.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-446A		9/24/2009	NA	NA	NA	NA	**33.0**	<0.1	NA	1.00	285	322	2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-446A	B	8/10/2010	28	206	24	11	**18.0**	<0.1	280	1.40	149	74	0.8	NA	NA	796	NA	2.24	NA	NA	0.54	0.021	<0.002
WR-446A	B	8/18/2011	32	168	27	10	**12.0**	<0.1	289	1.10	192	79	0.7	NA	NA	838	NA	1.46	NA	NA	0.022	0.019	<0.002
WR-446A	B	8/15/2012	31	181	27	12	9.1	<0.1	284	1.20	145	65	0.5	NA	NA	732	NA	1.32	NA	NA	<0.2	0.023	<0.001
WR-446A	B	9/18/2013	38	242	32	13	**17.0**	<0.1	286	1.30	182	125	1.1	NA	NA	931	NA	1.24	NA	NA	<0.2	0.021	<0.001
WR-446A	B	8/27/2014	43	281	36.6	13.8	**27.6**	<0.1	306	1.17	188	162	1.8	NA	NA	1070	NA	1.22	NA	NA	0.292	0.0189	<0.001
WR-446A	B	9/1/2015	24.8	195	22.1	10.9	8.82	<0.1	298	1.2	146	80.5	0.512	NA	NA	737	NA	1.09	NA	NA	0.0916	0.0278	<0.001
WR-446A	B	8/30/2016	25.2	185	22.4	10.4	4.42	<0.1	301	0.969	149	75.1	0.316	NA	NA	707	NA	0.93	NA	NA	0.0929	0.0241	<0.001
WR-447A		8/13/2003	42	250	22.0	15.0	**31.0**	<0.020	220	<5.0	100	230	2.4	NA	190	1000	<10	<1.0	<0.10	<0.010	<0.10	0.0083	0.0079
WR-447A		10/6/2003	43	260	23.0	16.0	**29.0**	<0.020	230	1.10	110	240	2.4	<0.050	200	1000	<10	<1.0	<0.10	<0.010	<0.10	0.0088	0.0038
WR-447A		2/12/2004	44	260	23.0	17.0	**28.0**	<0.020	220	1.10	110	240	2.7	NA	NA	990	<10	<1.0	NA	NA	NA	NA	NA
WR-447A		5/17/2004	43	240	23.0	18.0	**28.0**	<0.020	230	1.00	110	240	2.4	<0.050	200	1000	<10	<1.0	<0.10	<0.010	<0.10	0.009	<0.0030
WR-447A		8/16/2004	45	260	24.0	17.0	**29.0**	<0.020	230	1.10	100	240	2.6	<0.050	210	1000	<10	<1.0	<0.10	<0.010	<0.10	0.0061	<0.0030
WR-447A		2/9/2005	45	260	23.0	17.0	**28.0**	<0.020	230	1.00	110	220	2.5	<0.050	210	990	<10	<1.0	<0.10	<0.010	<0.10	0.0093	<0.0030
WR-447A		8/8/2005	44	250	22.0	15.0	**26.0**	<0.020	230	1.30	110	230	2.4	<0.050	200	970	<10	<1.0	<0.10	<0.010	<0.10	0.008	<0.0030
WR-447A		2/13/2006	46	260	24.0	19.0	**29.0**	<0.020	220	1.20	100	190	2.5	<0.050	210	980	<10	<1.0	0.2	<0.010	<0.10	0.0066	<0.0020
WR-447A		9/6/2006	NA	NA	NA	NA	**31.0**	<0.020	NA	1.30	110	230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-447A		2/13/2007	44	250	23.0	19.0	**28.0**	<0.020	220	1.20	120	250	2.5	0.06	200	970	<10	<1.0	<0.10	<0.010	<0.10	0.0096	<0.0020
WR-447A		8/23/2007	NA	NA	NA	NA	**25.0**	<0.020	NA	1.20	120	250	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA
WR-447A		8/14/2008	NA	NA	NA	NA	**29.0**	<0.1	NA	1.20	116	245	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-447A		9/28/2009	NA	NA	NA	NA	**28.0**	<0.1	NA	1.30	116	234	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-447A		9/28/2009	NA	NA	NA	NA	**28.0**	<0.1	NA	1.30	116	230	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-447A	B	8/10/2010	40	265	22	9.9	**27.0**	<0.1	223	1.40	120	222	2.5	NA	NA	951	NA	0.84	NA	NA	1.3	0.011	0.0068
WR-447A	B	8/18/2011	40	267	21	9.6	**27.0**	<0.1	222	1.30	120	218	2.5	NA	NA	974	NA	1.92	NA	NA	2.2	0.0093	<0.002
WR-447A	B	8/15/2012	41	263	21	10	**26.0**	<0.1	222	1.30	116	213	2.4	NA	NA	945	NA	0.73	NA	NA	<0.02	0.0089	<0.001
WR-447A	B	9/18/2013	40	262	22	10	**27.0**	<0.1	216	1.40	116	219	2.4	NA	NA	941	NA	0.64	NA	NA	<0.02	0.0097	<0.001
WR-447A	B	8/27/2014	39.7	269	21.4	10.1	**26.6**	<0.1	235	1.34	116	200	2.45	NA	NA	946	NA	0.55	NA	NA	<0.1	0.00938	<0.001
WR-447A	B	9/1/2015	39.2	259	21.1	10.3	**25.9**	<0.1	246	1.34	113	208	2.39	NA	NA	931	NA	0.58	NA	NA	0.242	0.0097	0.00192
WR-447A	B	8/30/2016	39.5	269	20.9	10.3	**26.6**	<0.1	247	1.31	114	214	2.37	NA	NA	939	NA	0.56	NA	NA	0.369	0.0103	0.00236
WR-448A		5/21/2003	53	950	27.0	5.3	3.5	0.12	220	<2.5	1600	290	2.6	0.085	240	3200	74	<1.0	2.7	<0.010	1.5	0.013	<0.0030
WR-448A		8/12/2003	45	870	24.0	4.4	3.4	0.14	210	1.10	1500	300	2.4	<0.050	210	3200	20	<1.0	0.4	<0.010	0.24	0.012	0.0055
WR-448A		10/6/2003	51	890	26.0	4.7	3.1	0.14	190	0.97	1900	320	2.4	0.084	240	3300	35	<1.0	1.1	<0.010	0.59	0.013	<0.0030
WR-448A		2/10/2004	49	860	24.0	5.0	3.3	0.12	200	1.10	1400	280	2.4	<0.050	220	3200	15	<1.0	0.3	<0.010	0.12	0.014	0.0038
WR-448A		8/16/2004	57	960	28.0	5.2	3.4	0.1	210	1.10	1500	300	2.2	0.11	260	3200	17	<1.0	0.4	<0.010	0.17	0.0095	<0.0030
WR-448A		2/7/2005	55	900	25.0	5.9	3.2	0.055	210	1.20	1500	280	2.4	<0.050	240	3200	<10	<1.0	0.2	<0.010	<0.10	0.015	<0.0030
WR-448A		8/11/2005	53	850	24.0	4.9	3.7	0.049	160	1.50	1600	330	2.2	0.069	230	3200	16	<1.0	0.3	<0.010	0.1	0.013	<0.0030
WR-448A	D	8/11/2005	57	890	26.0	5.3	3.6	0.053	160	1.60	1600	330	2.5	0.069	250	3300	<10	<1.0	0.3	<0.010	0.11	0.013	<0.0030
WR-448A		2/9/2006	56	940	27.0	6.8	3.8	0.029	200	1.30	1500	320	2.6	<0.050	250	3200	<10	<1.0	0.3	<0.010	0.13	0.0157	<0.0020
WR-448A		9/5/2006	NA	NA	NA	NA	4.2	0.029	NA	1.30	1700	340	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448A		2/12/2007	59	810	24.0	6.6	3.5	0.036	190	1.30	1600	320	2.5	<0.050	250	3300	<10	<1.0	0.1	<0.010	<0.10	0.0196	<0.01
WR-448A		2/12/2007	63	840	26.0	7.0	3.6	0.035	190	1.20	1600	320	2.5	<0.050	270	3300	<10	<1.0	0.2	<0.010	0.13	0.0181	<0.01
WR-448A		8/22/2007	NA	NA	NA	NA	3.7	0.018	NA	1.20	1400	320	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448A		8/11/2008	NA	NA	NA	NA	3.8	<0.1	NA	1.20	1660	340	2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 4
Selected Inorganics (mg/L) for Groundwater Monitor Wells
Tumamoc Landfill

Well	Notes	Date	Calcium	Sodium	Magnesium	Potassium	Nitrate	Nitrite	Bicarbonate Alkalinity	Fluoride	Sulfate	Chloride	Bromide	Total Phosphorus	Hardness ($CaCO_3$)	Total Dissolved Solids	Total Suspended Solids	Total Organic Carbon	Aluminum	Chromium	Iron	Arsenic	Lead
WR-448A		9/24/2009	NA	NA	NA	NA	4.2	<0.1	NA	1.40	1540	362	2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448A	B	8/11/2010	37	1040	24	2.3	4.6	<0.1	217	1.40	1570	343	2.9	NA	NA	3220	NA	0.7	NA	NA	<0.02	0.019	<0.002
WR-448A	B	2/1/2011	38	1080	24	2.2	4.2	<0.1	211	1.30	1570	344	2.9	NA	NA	3240	NA	0.49	NA	NA	0.038	0.018	<0.002
WR-448A	B	8/17/2011	38	975	23	2.2	4.9	<0.1	219	1.50	1630	368	3	NA	NA	3230	NA	0.34	NA	NA	<0.02	0.02	<0.002
WR-448A	B	8/16/2012	38	1040	23	2.2	4.9	<0.1	215	1.50	1540	337	3	NA	NA	3190	NA	0.29	NA	NA	<0.02	0.022	<0.002
WR-448A	B	9/17/2013	39	1030	25	2.2	5.3	<0.1	210	1.50	1580	362	3	NA	NA	3240	NA	<0.25	NA	NA	<0.02	0.023	<0.002
WR-448A	B	8/28/2014	39.3	1070	25.9	2.2	5.3	<0.1	230	1.46	1590	369	3.03	NA	NA	3220	NA	<0.25	NA	NA	<0.1	0.0228	<0.002
WR-448A	B	9/1/2015	38.9	1040	24.6	2.91	5.39	<0.1	238	1.5	1690	405	3.11	NA	NA	3150	NA	<0.25	NA	NA	<0.02	0.0216	<0.002
WR-448B		5/20/2003	39	1400	28.0	6.9	2.4	0.078	730	<2.5	1500	690	9.9	0.063	220	4000	120	1.2	2.4	<0.010	1.5	0.004	<0.0030
WR-448B		8/11/2003	56	1500	46.0	6.9	3.6	<0.020	780	0.85	2200	920	NA	0.14	330	6300	110	1.9	2.8	<0.010	1.9	<0.0040	<0.0030
WR-448B		10/8/2003	61	1900	50.0	7.2	3.4	<0.020	820	1.00	2700	1200	7.7	<0.050	360	6400	<10	<1.0	0.4	<0.010	0.17	<0.0040	<0.0030
WR-448B		2/10/2004	68	2100	58.0	7.9	1.7	<0.020	880	0.81	2800	1200	9.4	<0.050	410	7300	<10	<1.0	0.6	<0.010	0.33	<0.0040	<0.0060
WR-448B		8/17/2004	150	3100	140.0	13.0	3.8	<0.020	1100	0.92	4200	2000	13	0.062	950	11000	<10	<1.0	0.8	<0.010	0.53	<0.0040	<0.0060
WR-448B		2/8/2005	190	3600	160.0	16.0	1.8	<0.020	1000	0.74	4500	1900	17	0.15	1200	12000	190	2.0	7.1	<0.010	4.7	<0.0080	<0.0030
WR-448B		8/16/2005	210	3900	190.0	15.0	1.0	<0.020	1000	<1.5	5800	2400	17	0.13	1300	13000	30	1.5	1.2	<0.010	0.6	<0.0010	<0.0060
WR-448B		2/14/2006	250	4400	250.0	19.0	1.5	<0.020	1200	<1.0	5100	2400	17	0.12	1700	15000	240	<2.0	3.9	<0.010	2.1	0.0059	<0.0100
WR-448B		8/29/2006	NA	NA	NA	NA	<0.50	<0.020	NA	1.00	6000	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448B	D	8/29/2006	NA	NA	NA	NA	<0.50	0.023	NA	1.00	6300	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448B		2/6/2007	240	4100	210.0	19.0	2.1	<0.020	1200	<2.5	6200	2600	19	<0.050	1500	14000	270	<1.0	0.4	<0.010	0.24	<0.03	<0.02
WR-448B		8/15/2007	NA	NA	NA	NA	1.4	<0.10	NA	<1.0	6900	3200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448B		8/13/2008	NA	NA	NA	NA	<2.5	<0.1	NA	1.30	6800	2990	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448B		8/13/2008	NA	NA	NA	NA	<0.25	<0.1	NA	1.20	7190	3140	23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448B	B	9/23/2009	NA	NA	NA	NA	0.7	<10	NA	<0.1	19800	9600	68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-448B	B	3/30/2011	403	6360	421	8.3	<0.25	<1	1210	**4.00**	8820	3850	29	NA	NA	20200	NA	1.17	NA	NA	1.9	0.009	<0.002
WR-448B	B	8/18/2011	424	6990	450	7.5	<2.5	<1	1330	2.30	9850	4320	33	NA	NA	23200	NA	1.62	NA	NA	0.32	0.0044	<0.002
WR-448B	B	8/16/2012	414	4490	218	5.7	<0.25	<1	2010	2.20	3860	3600	15	NA	NA	15600	NA	9.26	NA	NA	3.4	**0.14**	<0.01
WR-448B	B	9/17/2013	83	2430	67	3.2	<0.25	<0.1	820	1.10	2590	1340	8	NA	NA	7020	NA	1.95	NA	NA	2.1	0.023	<0.005
WR-448B	B	8/27/2014	119	3120	114	3.96	<0.25	<0.1	1030	1.07	3640	1860	12.8	NA	NA	9900	NA	0.95	NA	NA	9.13	**0.0835**	<0.005
WR-448B	B	9/1/2015	316	4690	249	11.2	<0.25	<0.1	1400	1.25	6290	3070	21.1	NA	NA	18000	NA	6.69	NA	NA	24.3	0.109	<0.01
WR-449A		5/21/2003	36	300	20.0	25.0	**27.0**	0.87	240	1.20	81	250	3.4	0.12	170	1000	87	2.1	1.3	<0.010	1.3	0.016	0.0053
WR-449A		8/12/2003	29	270	16.0	18.0	**30.0**	0.048	230	1.20	86	260	3.3	0.08	140	1100	49	1.2	0.9	<0.010	0.77	0.017	0.0051
WR-449A		10/7/2003	29	290	18.0	22.0	**29.0**	<0.020	220	1.00	94	280	3	<0.050	150	1100	<10	1.0	0.1	<0.010	<0.10	0.013	0.0063
WR-449A		2/11/2004	28	300	17.0	20.0	**30.0**	<0.020	220	1.00	99	320	3.3	<0.050	140	1000	<10	<1.0	<0.10	<0.010	<0.10	0.022	0.015
WR-449A		8/18/2004	30	260	19.0	25.0	**32.0**	<0.020	210	1.10	82	270	2.9	0.064	150	1000	<10	1.1	0.1	<0.010	<0.10	0.018	<0.0030
WR-449A		2/9/2005	29	290	18.0	22.0	**28.0**	<0.020	210	1.10	91	260	3.1	<0.050	150	1000	<10	1.3	0.2	<0.010	<0.10	0.024	<0.0030
WR-449A		8/11/2005	29	270	18.0	21.0	**28.0**	<0.020	190	1.60	97	280	2.5	<0.050	150	1100	<10	1.2	0.2	<0.010	<0.10	0.019	0.0037
WR-449A		2/13/2006	31	310	19.0	25.0	**28.0**	<0.020	220	1.20	94	260	3.1	<0.050	160	1000	<10	<1.0	<0.10	<0.010	<0.10	0.017	<0.0020
WR-449A		9/6/2006	NA	NA	NA	NA	31.0	<0.020	NA	1.30	100	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-449A		2/13/2007	30	290	19.0	27.0	**27.0**	<0.020	220	1.20	100	290	3	<0.050	150	1000	<10	<1.0	<0.10	<0.010	<0.10	0.0195	<0.0020
WR-449A		8/23/2007	NA	NA	NA	NA	**25.0**	<0.020	NA	1.20	95	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-449A		8/14/2008	NA	NA	NA	NA	**27.0**	<0.1	NA	1.20	105	264	2.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-449A		9/28/2009	NA	NA	NA	NA	**26.0**	<0.1	NA	1.40	109	268	2.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-449A	HS-60'	11/23/2009	NA	NA	NA	NA	**25.0**	0.042	NA	1.30	100	270	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-449A	HS-97'	11/23/2009	NA	NA	NA	NA	**25.0**	0.023	NA	1.30	100	270	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-449A	HS-186'	11/23/2009	NA	NA	NA	NA	**24.0**	0.026	NA	1.30	110	270	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 4
Selected Inorganics (mg/L) for Groundwater Monitor Wells
Tumamoc Landfill

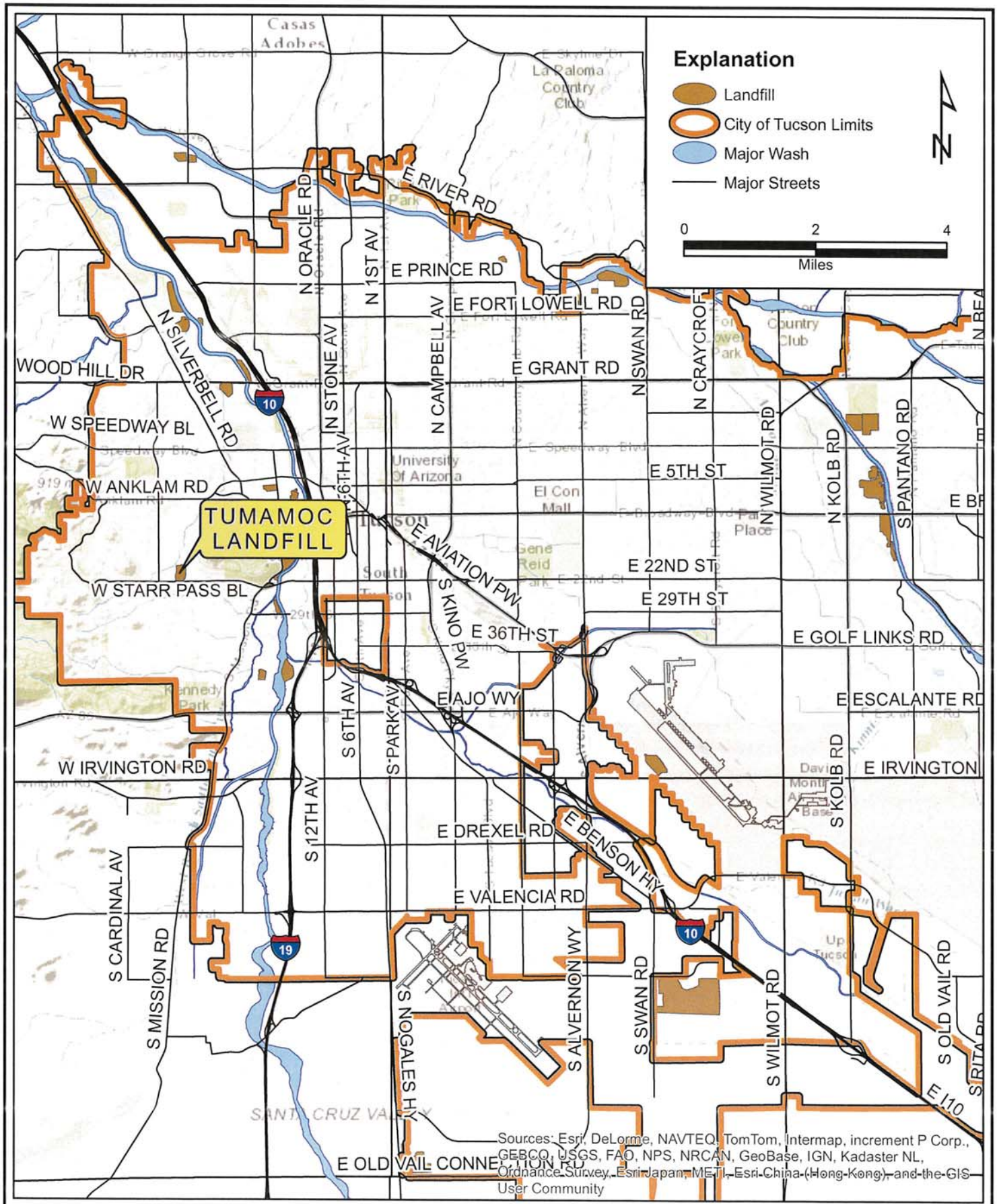
Well	Notes	Date	Calcium	Sodium	Magnesium	Potassium	Nitrate	Nitrite	Bicarbonate Alkalinity	Fluoride	Sulfate	Chloride	Bromide	Total Phosphorus	Hardness ($CaCO_3$)	Total Dissolved Solids	Total Suspended Solids	Total Organic Carbon	Aluminum	Chromium	Iron	Arsenic	Lead
WR-449A	B	8/11/2010	23	315	15	12	26.0	<0.1	216	1.40	110	270	3	NA	NA	1030	NA	1.24	NA	NA	<0.02	0.023	<0.002
WR-449A	B	8/17/2011	22	288	14	11	26.0	<0.1	215	1.30	113	272	3	NA	NA	1040	NA	1.05	NA	NA	<0.02	0.022	<0.002
WR-449A	B	8/16/2012	22	317	14	11	25.0	<0.1	218	1.40	114	255	2.9	NA	NA	1020	NA	1.09	NA	NA	<0.02	0.024	<0.001
WR-449A	B	9/17/2013	22	311	14	9.9	25.0	<0.1	215	1.50	139	255	2.8	NA	NA	990	NA	1.08	NA	NA	0.024	0.023	<0.001
WR-449A	B	8/28/2014	22.3	325	14.7	10.3	23.7	<0.1	235	1.41	120	237	2.73	NA	NA	1010	NA	0.95	NA	NA	<0.1	0.0243	<0.001
WR-449A	B	9/1/2015	21.3	318	14	10.6	22.9	<0.1	242	1.43	113	245	2.76	NA	NA	995	NA	1.1	NA	NA	<0.02	0.024	<0.001
WR-449A	B	8/31/2016	21	313	13.7	10.5	30.3	<0.1	250	1.39	113	308	2.7	NA	NA	997	NA	0.94	NA	NA	<0.02	0.0249	<0.001
WR-454A		10/13/2004	17	150	4.5	<2.0	2.0	<0.020	300	0.69	37	33	<0.50	<0.050	61	480	18	1.2	0.4	<0.010	<0.10	<0.0040	0.0046
WR-454A		2/14/2005	18	150	4.9	2.1	2.2	<0.020	320	0.79	35	32	<0.50	<0.050	66	460	56	1.3	2.6	<0.010	0.48	<0.0040	<0.0030
WR-454A		8/15/2005	17	150	4.3	<2.0	2.0	<0.020	310	0.97	150	33	<0.50	0.12	60	470	<10	<1.0	0.2	<0.010	<0.10	<0.0040	<0.0030
WR-454A		2/7/2006	17	160	4.4	<2.0	2.0	<0.020	310	0.82	34	33	<0.50	<0.050	61	470	<10	<1.0	<0.10	<0.010	<0.10	0.0016	<0.0020
WR-454A		8/28/2006	NA	NA	NA	NA	2.0	<0.020	320	0.83	34	32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454A		2/5/2007	17	150	4.4	<2.0	2.3	<0.020	310	0.88	38	36	<0.50	<0.25	60	460	<10	<1.0	<0.10	<0.010	0.33	<0.003	<0.0020
WR-454A		2/5/2007	17	150	4.5	<2.0	2.3	<0.020	320	0.84	36	34	<0.50	<0.25	61	440	<10	<1.0	<0.10	<0.010	0.49	<0.003	<0.0020
WR-454A		8/15/2007	NA	NA	NA	NA	2.0	<0.010	NA	0.81	35	36	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454A	D	8/15/2007	NA	NA	NA	NA	1.9	<0.010	NA	0.84	35	33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454A		8/12/2008	NA	NA	NA	NA	2.0	<0.1	NA	0.80	34	33	0.27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454A		9/29/2009	NA	NA	NA	NA	2.0	<0.1	NA	0.86	36	33	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454A	B	8/9/2010	15	160	4.1	1.3	1.7	<0.1	298	0.88	36	33	0.31	NA	NA	465	NA	1.01	NA	NA	0.63	<0.002	<0.002
WR-454A	B	8/18/2011	15	163	4.3	1.3	2.2	<0.1	293	0.85	38	34	0.29	NA	NA	473	NA	0.33	NA	NA	0.26	<0.002	<0.002
WR-454A	B	8/15/2012	16	167	4.3	1.2	1.6	<0.1	302	0.82	37	34	0.35	NA	NA	473	NA	0.42	NA	NA	0.088	0.0014	<0.001
WR-454A	B	9/18/2013	8.5	174	4.3	1.2	2.0	<0.1	248	0.92	37	32	0.29	NA	NA	449	NA	<0.25	NA	NA	<0.02	0.0026	<0.001
WR-454A	B	8/28/2014	7.37	174	4.33	1.23	2.1	<0.1	272	0.87	37.2	33	0.292	NA	NA	455	NA	<0.25	NA	NA	<0.1	0.00206	<0.001
WR-454A	B	9/1/2015	12.3	164	4.21	1.26	1.96	<0.1	312	0.913	35.1	31.3	0.303	NA	NA	452	NA	0.42	NA	NA	0.0274	0.00235	<0.001
WR-454A	B	8/30/2016	7.87	169	4.12	1.39	2	<0.1	281	0.85	35.5	31.8	0.292	NA	NA	443	NA	0.31	NA	NA	0.502	0.00296	<0.001
WR-454A	B, D	8/30/2016	7.55	171	4.12	1.41	2	<0.1	284	0.854	35.6	31.8	0.293	NA	NA	450	NA	<0.25	NA	NA	0.11	0.00295	<0.001
WR-454B		10/11/2004	83	260	53.0	3.3	8.4	<0.020	220	0.81	270	330	2.7	0.05	420	1300	140	1.6	0.6	<0.010	0.26	0.0088	0.0044
WR-454B		2/15/2005	81	300	50.0	2.3	8.2	<0.020	240	1.10	220	270	2.1	0.073	410	1200	15	1.6	0.3	<0.010	0.13	0.0073	0.0075
WR-454B		8/16/2005	76	260	48.0	3.0	6.1	<0.020	260	1.00	270	330	2.1	0.37	390	1200	<10	1.8	0.2	<0.010	<0.10	0.0061	0.0094
WR-454B	D	8/16/2005	75	250	47.0	2.6	6.1	<0.020	260	1.00	260	320	2.1	0.14	380	1300	<10	1.7	0.2	<0.010	<0.10	0.0059	0.022
WR-454B		2/7/2006	82	300	51.0	3.5	6.8	<0.020	250	0.86	240	320	2.8	0.076	410	1200	110	1.5	1.3	<0.010	0.71	0.0068	0.0036
WR-454B		8/31/2006	NA	NA	NA	NA	5.7	<0.020	NA	0.83	280	430	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454B		2/8/2007	100	340	55.0	7.4	5.4	<0.020	270	0.68	280	410	3.1	0.094	480	1500	60	2.2	5.6	0.02	3.6	0.0047	0.026
WR-454B		8/20/2007	NA	NA	NA	NA	3.9	<0.020	NA	0.75	270	440	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454B		8/7/2008	NA	NA	NA	NA	4.7	<0.1	NA	0.69	310	458	3.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454B	B	9/23/2009	NA	NA	NA	NA	3.3	<0.1	NA	0.75	221	341	2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-454B	B	8/10/2010	56	328	41	2.6	4.5	<0.1	268	0.82	215	382	2.9	NA	NA	1200	NA	1.89	NA	NA	0.099	0.0032	<0.002
WR-454B	B	8/18/2011	43	280	30	1.6	5.4	<0.1	261	0.76	207	322	2.7	NA	NA	1170	NA	1.36	NA	NA	<0.02	0.0041	<0.002
WR-454B	B	8/15/2012	57	316	40	2.2	3.9	<0.1	270	0.76	213	329	2.7	NA	NA	1200	NA	1.28	NA	NA	<0.02	0.0046	<0.001
WR-454B	B	8/15/2012	58	322	41	2.2	3.8	<0.1	269	0.75	213	332	2.7	NA	NA	1180	NA	1.28	NA	NA	<0.02	0.005	<0.001
WR-454B	B	9/17/2013	49	324	39	2.1	4.5	<0.1	253	0.86	211	328	2.5	NA	NA	1160	NA	1.3	NA	NA	<0.02	0.005	<0.001
WR-454B	B	8/28/2014	50.3	304	35.8	1.9	4.9	<0.1	295	0.82	222	271	1.97	NA	NA	1110	NA	1.09	NA	NA	<0.1	0.00519	<0.001
WR-454B	B	9/1/2015	42.6	300	32.5	2.3	4.81	<0.1	309	0.819	202	242	1.95	NA	NA	1040	NA	1.08	NA	NA	<0.02	0.00553	<0.001
WR-454B	B	8/30/2016	41.8	296	29.6	2.17	3.71	<0.1	352	0.808	184	198	1.46	NA	NA	963	NA	0.94	NA	NA	0.0218	0.00635	<0.001

Table 4
Selected Inorganics (mg/L) for Groundwater Monitor Wells
Tumamoc Landfill

Well	Notes	Date	Calcium	Sodium	Magnesium	Potassium	Nitrate	Nitrite	Bicarbonate Alkalinity	Fluoride	Sulfate	Chloride	Bromide	Total Phosphorus	Hardness ($CaCO_3$)	Total Dissolved Solids	Total Suspended Solids	Total Organic Carbon	Aluminum	Chromium	Iron	Arsenic	Lead
WR-455A		10/12/2004	36	150	18.0	7.8	2.9	<0.020	320	0.89	49	53	0.62	0.093	160	590	270	<1.0	6.3	0.02	0.97	0.0098	0.011
WR-455A		2/15/2005	40	170	20.0	3.7	3.1	<0.020	330	0.86	54	69	0.55	0.14	180	590	260	1.8	5.1	<0.010	1	0.014	0.011
WR-455A		8/16/2005	37	140	19.0	3.6	3.2	<0.020	310	0.84	59	77	0.66	0.23	170	610	95	<1.0	1.9	0.01	0.31	0.011	**0.26**
WR-455A		2/7/2006	45	160	22.0	4.9	3.1	<0.020	310	0.84	49	76	0.63	0.065	200	600	580	N/A	3.0	<0.010	0.48	0.009	0.0055
WR-455A	D	2/7/2006	48	150	21.0	6.7	3.1	<0.020	310	0.82	48	73	0.62	0.055	210	590	520	<1.0	6.3	<0.010	0.97	**0.0598**	**0.0568**
WR-455A		8/31/2006	NA	NA	NA	NA	3.3	<0.020	NA	1.10	54	84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455A		2/8/2007	32	150	15.0	3.5	2.9	0.062	330	0.95	71	78	0.6	0.078	140	610	76	<1.0	1.7	0.03	0.35	0.0062	0.0103
WR-455A		8/20/2007	NA	NA	NA	NA	2.8	<0.020	NA	0.93	61	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455A		8/7/2008	NA	NA	NA	NA	2.9	<0.1	NA	1.00	60	77	0.65	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455A	B	9/23/2009	NA	NA	NA	NA	2.4	<0.1	NA	1.20	67	62	0.52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455A	B	8/10/2010	24	184	12	1.5	2.3	<0.1	307	1.30	69	65	0.57	NA	NA	594	NA	0.92	NA	NA	<0.02	0.015	<0.002
WR-455A	B	8/18/2011	20	139	12	1.3	0.7	<0.1	286	0.96	60	80	0.68	NA	NA	557	NA	0.86	NA	NA	<0.02	0.0096	<0.002
WR-455A	B	8/15/2012	18	176	15	1.6	0.7	<0.1	266	0.94	57	80	0.73	NA	NA	523	NA	0.42	NA	NA	<0.02	0.012	<0.001
WR-455A	B	9/17/2013	15	175	15	1.6	0.8	<0.1	246	1.00	57	80	0.66	NA	NA	525	NA	0.43	NA	NA	<0.02	0.012	<0.001
WR-455A	B	8/28/2014	13.3	179	14.5	1.57	0.9	<0.1	261	0.97	57.2	79.4	0.692	NA	NA	523	NA	0.34	NA	NA	<0.1	0.0131	<0.001
WR-455A	B	9/1/2015	9.83	175	14.1	1.87	0.873	<0.1	264	0.993	56.8	79.2	0.687	NA	NA	516	NA	0.41	NA	NA	<0.02	0.014	<0.001
WR-455A	B	8/30/2016	9.56	183	13.9	1.81	1.07	<0.1	205	0.964	145	80	0.69	NA	NA	556	NA	0.35	NA	NA	<0.02	0.0152	<0.001
WR-455B		10/11/2004	95	120	32.0	17.0	2.7	0.11	300	0.55	110	41	<0.50	0.34	370	670	3200	<10	18.0	0.04	5.5	0.0082	0.019
WR-455B		2/15/2005	60	130	27.0	9.3	2.6	<0.020	320	0.60	78	53	<0.50	0.25	260	580	510	<1.0	9.1	<0.010	2.1	0.0084	0.016
WR-455B		8/16/2005	65	110	24.0	7.9	2.9	<0.020	320	0.69	67	67	0.53	0.29	260	620	140	<5.0	6.9	0.02	1.5	0.007	**0.16**
WR-455B		2/7/2006	60	7.2	25.0	7.2	3.4	<0.020	320	0.65	54	57	0.51	0.077	250	580	810	<5.0	5.6	0.03	1.5	0.045	**0.0578**
WR-455B		8/31/2006	NA	NA	NA	NA	3.1	<0.020	NA	0.70	55	70	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455B		2/8/2007	130	120	29.0	13.0	2.6	<0.020	310	0.62	60	75	0.59	1	450	550	650	<1.0	15.0	**0.13**	4.9	<0.015	0.0329
WR-455B		8/21/2007	NA	NA	NA	NA	2.7	<0.040	NA	0.65	57	66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455B		8/7/2008	NA	NA	NA	NA	2.8	<0.1	NA	0.64	55	69	0.58	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455B	D	8/7/2008	NA	NA	NA	NA	2.8	<0.1	NA	0.64	54	68	0.59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455B	B	9/23/2009	NA	NA	NA	NA	2.7	<0.1	NA	0.67	55	69	0.59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WR-455B	B	8/10/2010	37	135	24	1.8	2.6	<0.1	303	0.75	57	71	0.59	NA	NA	577	NA	0.9	NA	NA	0.025	0.0095	<0.002
WR-455B	B	8/18/2011	34	150	23	1.7	2.8	<0.1	318	0.71	56	65	0.62	NA	NA	583	NA	0.73	NA	NA	0.1	0.0097	<0.002
WR-455B	B	8/15/2012	34	148	22	1.7	2.8	<0.1	308	0.66	54	62	0.54	NA	NA	570	NA	0.38	NA	NA	<0.02	0.011	<0.001
WR-455B	B	9/17/2013	33	147	23	1.6	2.8	<0.1	303	0.8	54	60	0.51	NA	NA	567	NA	0.31	NA	NA	<0.02	0.0098	<0.001
WR-455B	B	8/28/2014	34.6	150	22.5	1.6	2.84	<0.1	330	0.685	53.7	59.9	0.537	NA	NA	565	NA	<0.25	NA	NA	<0.1	0.00962	<0.001
WR-455B	B,D	9/1/2015	33.1	144	22.6	1.79	2.79	<0.1	341	0.699	53.7	59.8	0.536	NA	NA	563	NA	0.42	NA	NA	<0.02	0.0104	<0.001
WR-455B	B,D	9/1/2015	33.1	144	22.6	1.79	2.79	<0.1	341	0.699	53.7	59.8	0.536	NA	NA	563	NA	0.42	NA	NA	<0.02	0.0104	<0.001
WR-455B	B	8/30/2016	33.9	148	23	1.81	2.83	<0.1	321	0.657	72.3	64.6	0.526	NA	NA	581	NA	0.28	NA	NA	<0.02	0.0112	<0.001
AWQS							**10**	**1**		**4**										**0.1**		**0.05**	**0.05**

D = duplicate sample; DL = duplicate sample sent to different lab
Bold values are above aquifer water quality standards.
NA = not analyzed
B = no purge, bail sample.
HS = Hydrasleeve discrete depth samples with depth in feet below ground surface following.

FIGURES

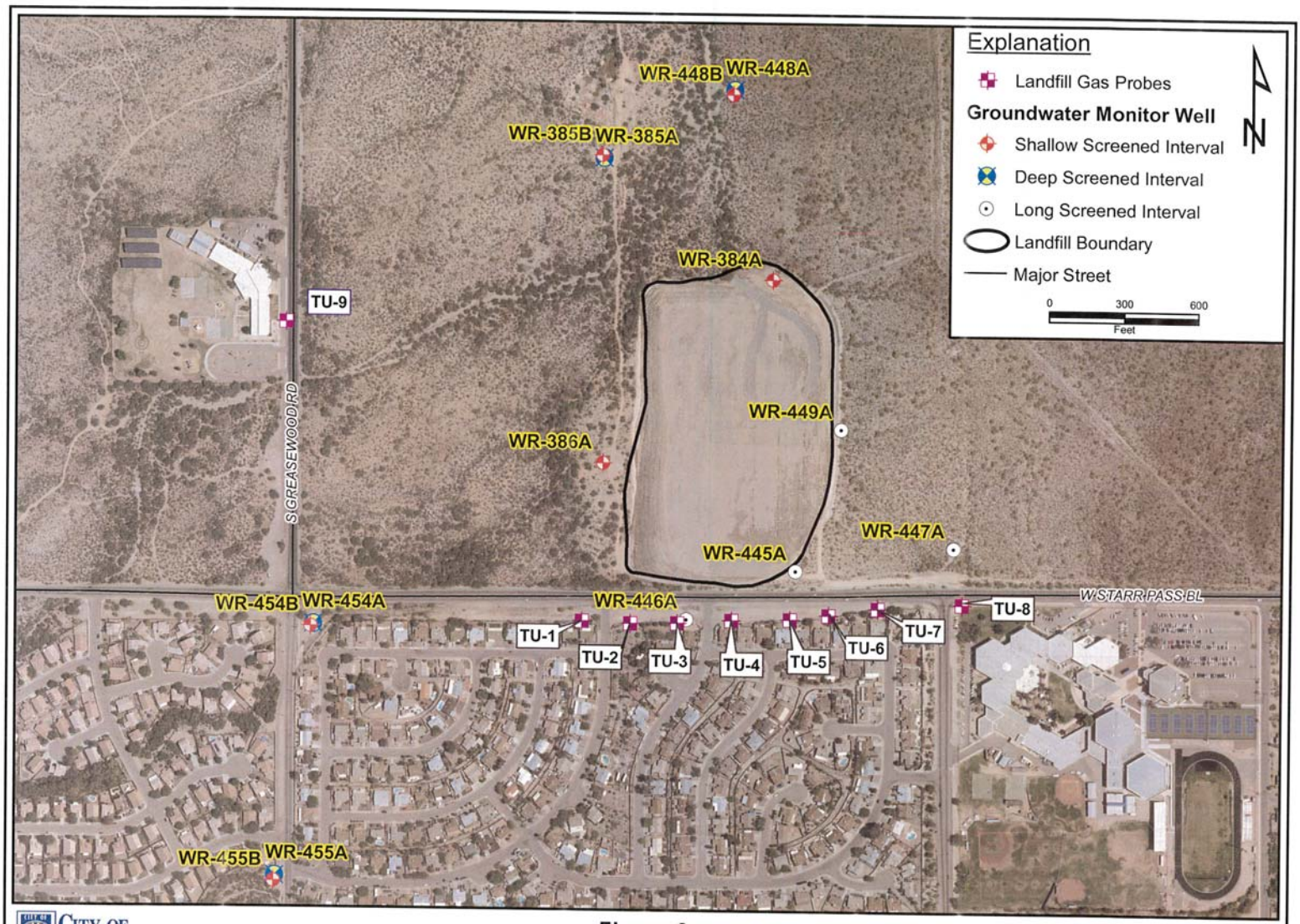


CITY OF TUCSON
ENVIRONMENTAL SERVICES

Figure 1
Location Map
Tumamoc Landfill

Drawn By:	LE
Checked:	AB
Approved:	TR
Date:	11/25/2016
File:	See Below

J://GIS/Tumamoc/2016
LocationMap_new.mxd

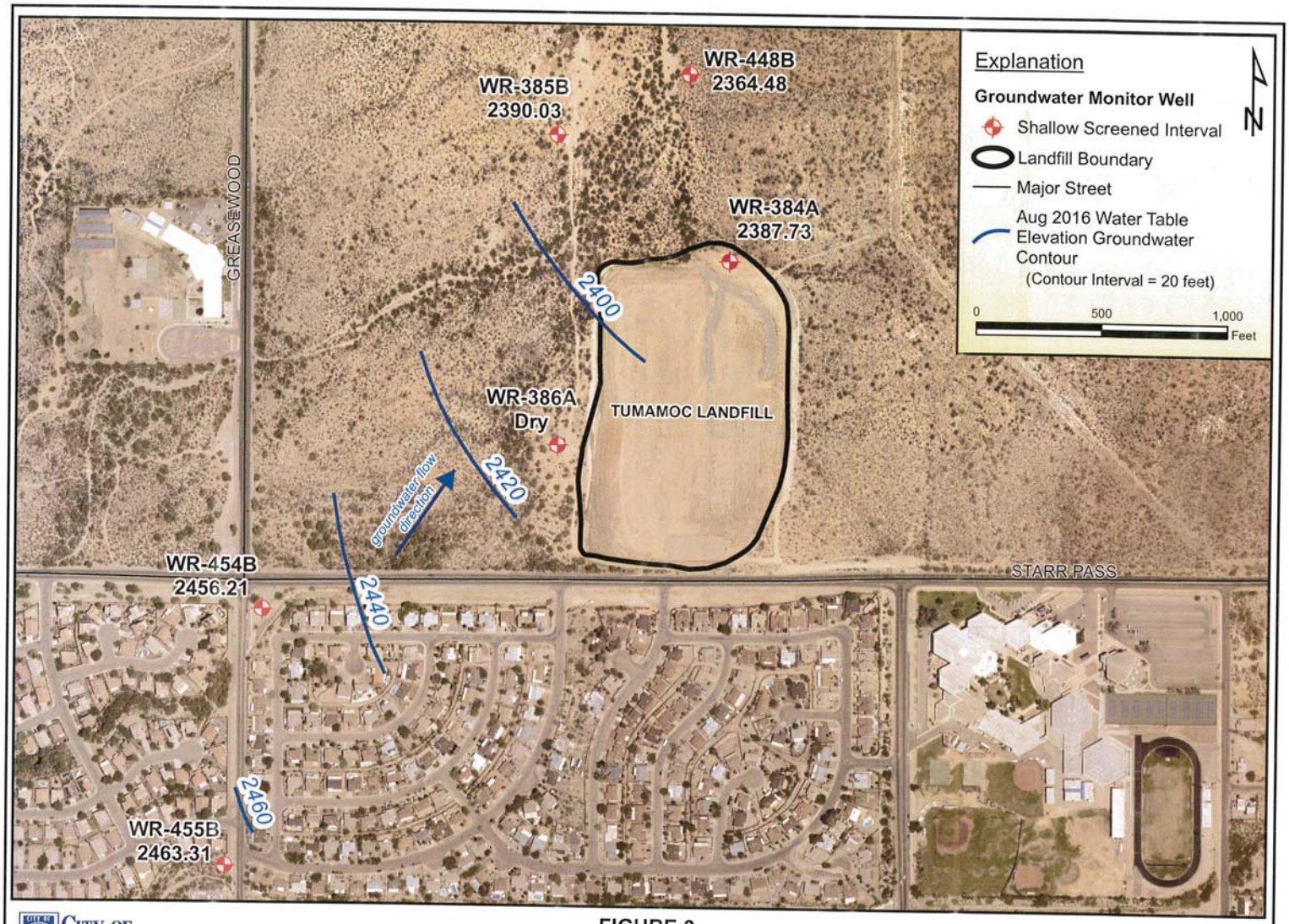


CITY OF TUCSON
ENVIRONMENTAL SERVICES

Figure 2
Site Map
Tumamoc Landfill

Drawn By:	LE
Checked:	AB
Approved:	TR
Date:	11/25/2016
File:	See Below

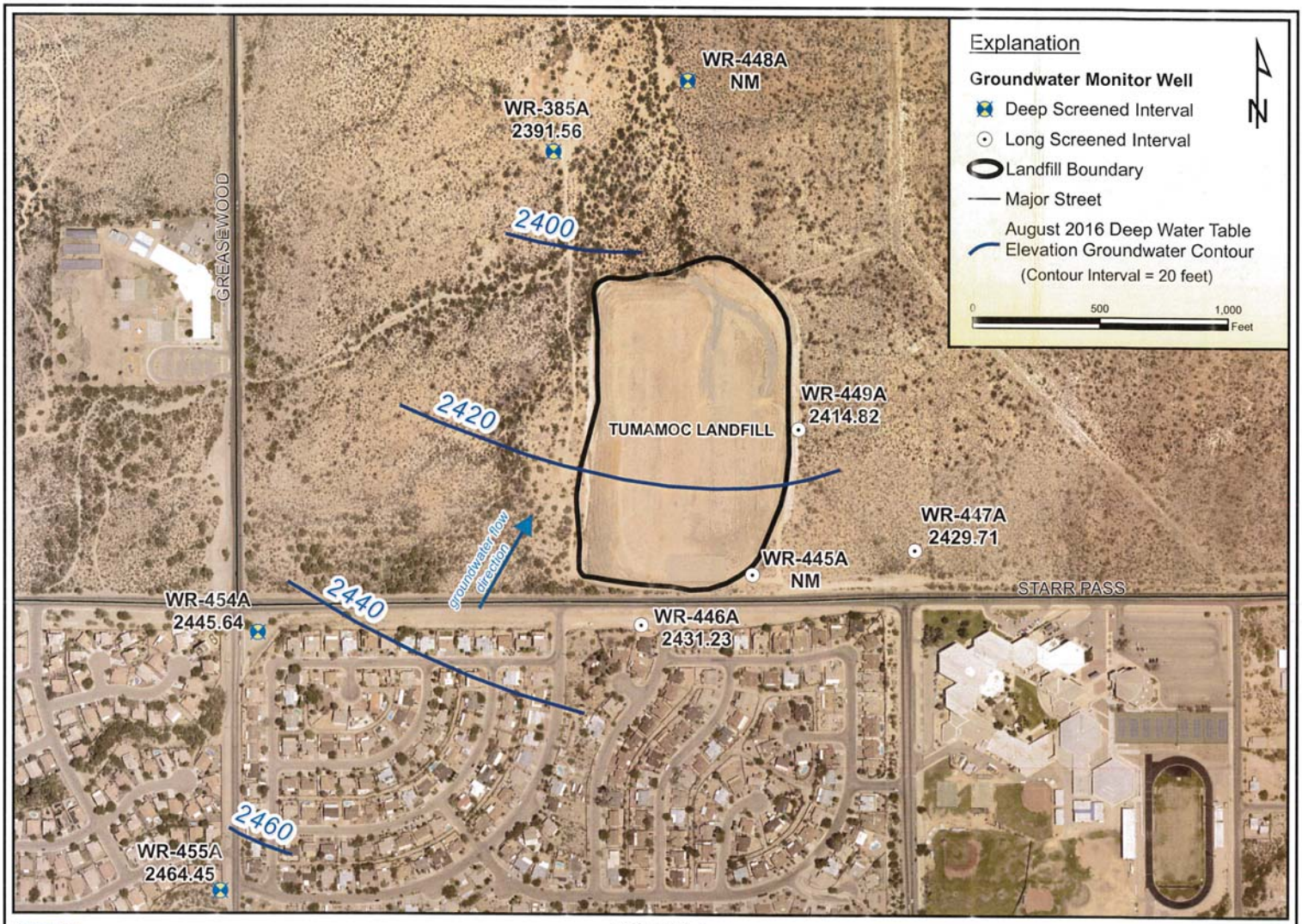
E:\GIS\Tumamoc 2016 SiteMap.mxd



CITY OF TUCSON
ENVIRONMENTAL SERVICES

FIGURE 3
Potentiometric Surface Map (Shallow)
Tumamoc Landfill

Drawn By:	LE
Checked:	AB
Approved:	TR
Date:	11/25/2016
File:	See Below

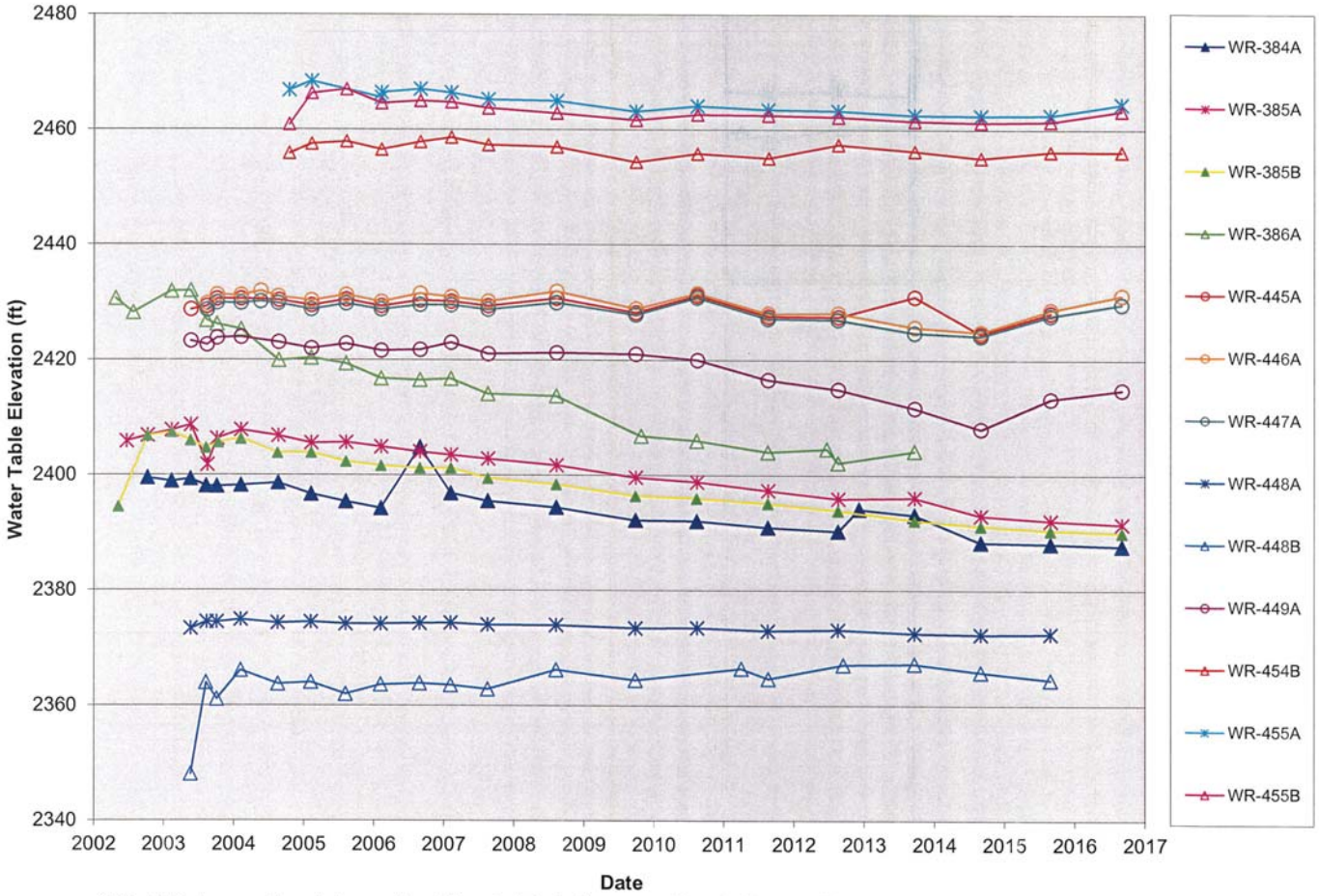


CITY OF TUCSON
ENVIRONMENTAL SERVICES

FIGURE 4
Potentiometric Surface Map (Deep)
Tumamoc Landfill

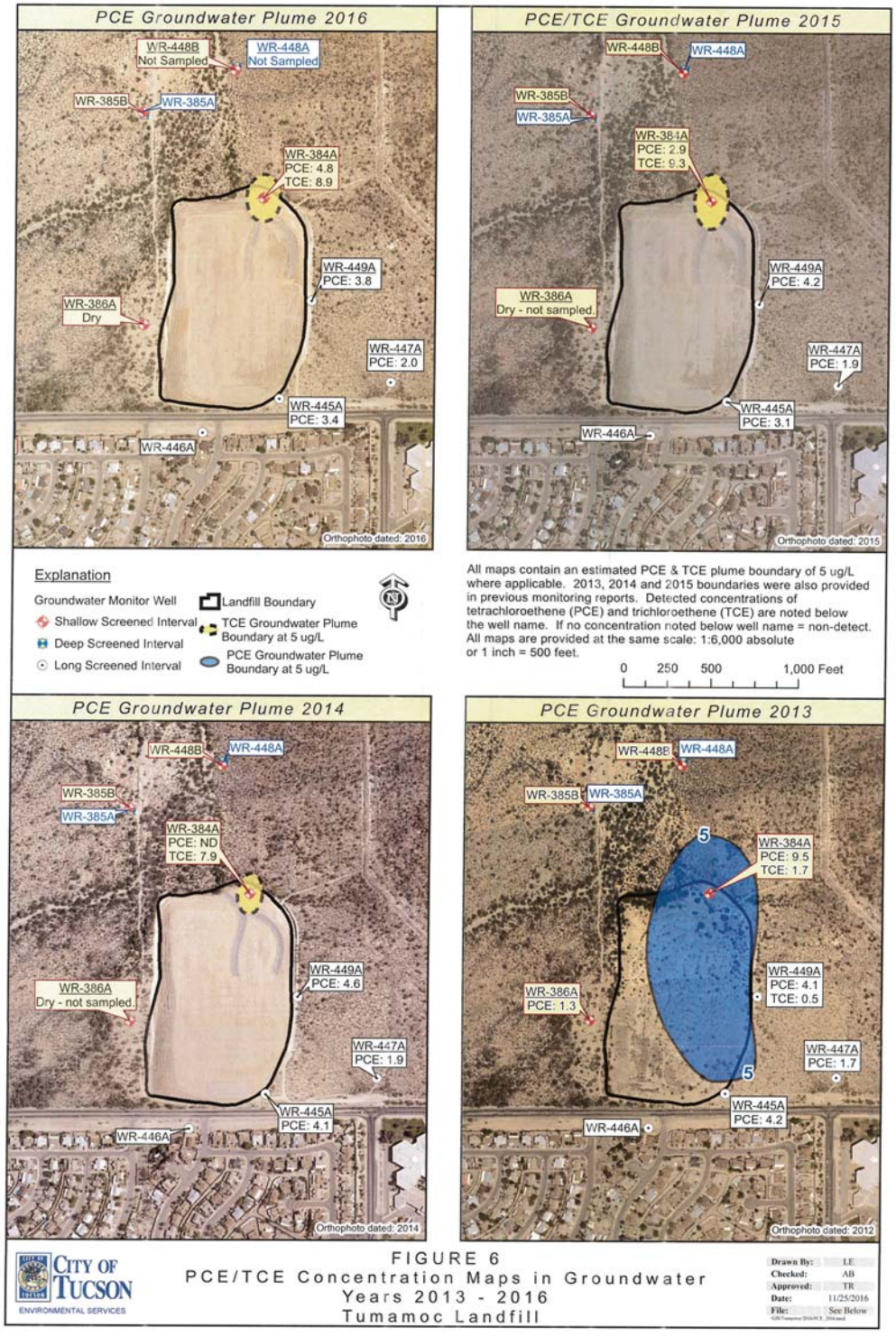
Drawn By:	LE
Checked:	AB
Approved:	TR
Date:	11/25/2016
File:	See Below

Figure 5
Hydrographs for all Groundwater Monitor Wells
Tumamoc Landfill



*WR-454A is normally artesian well and is not plotted. Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles. WR-386A has been dry since August 2014.

S:\EMCOMMON\Tumamoc\Well Information\Water Levels\Hydrographs.xls

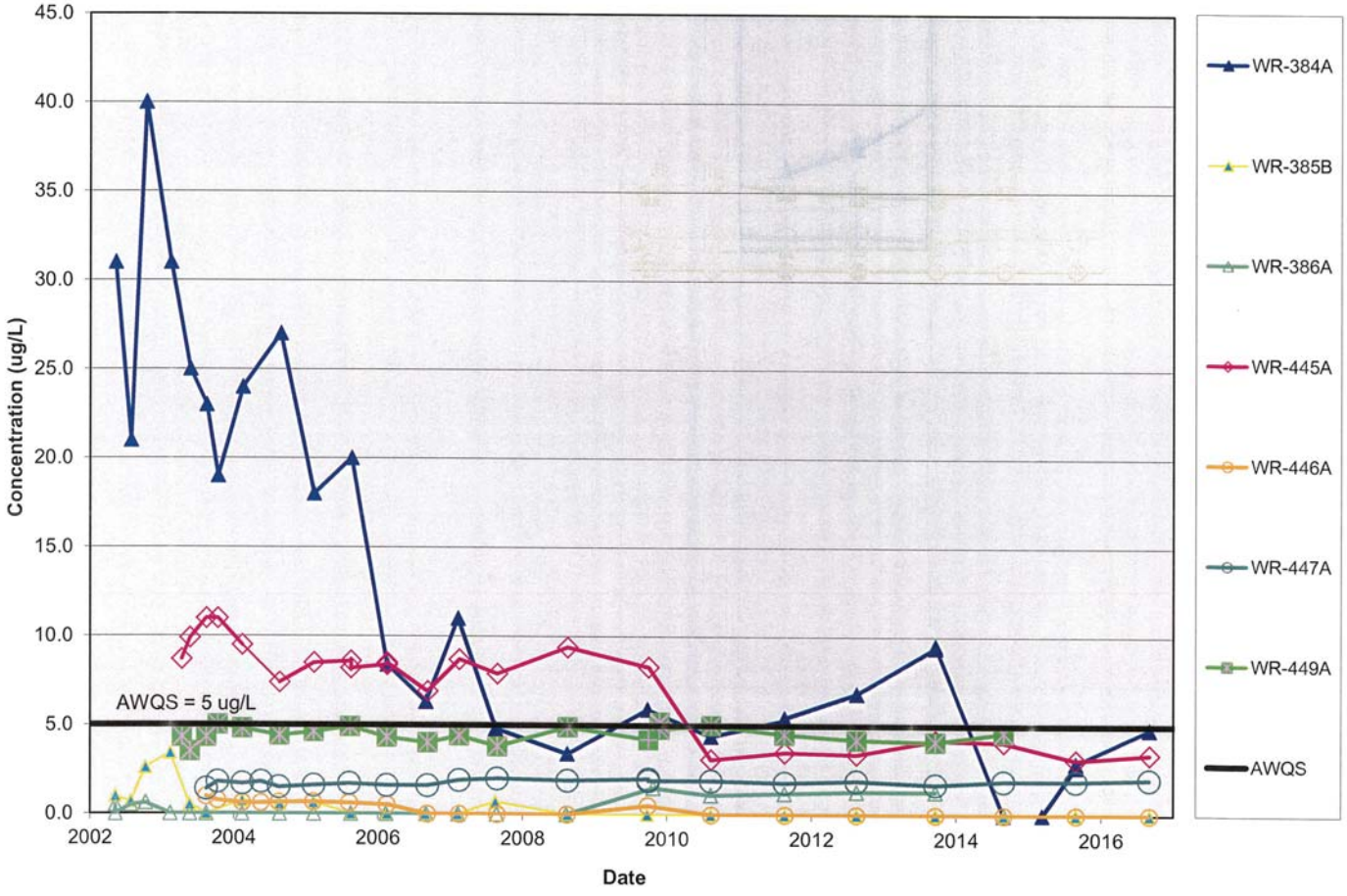


CITY OF TUCSON
ENVIRONMENTAL SERVICES

FIGURE 6
PCE/TCE Concentration Maps in Groundwater
Years 2013 - 2016
Tumamoc Landfill

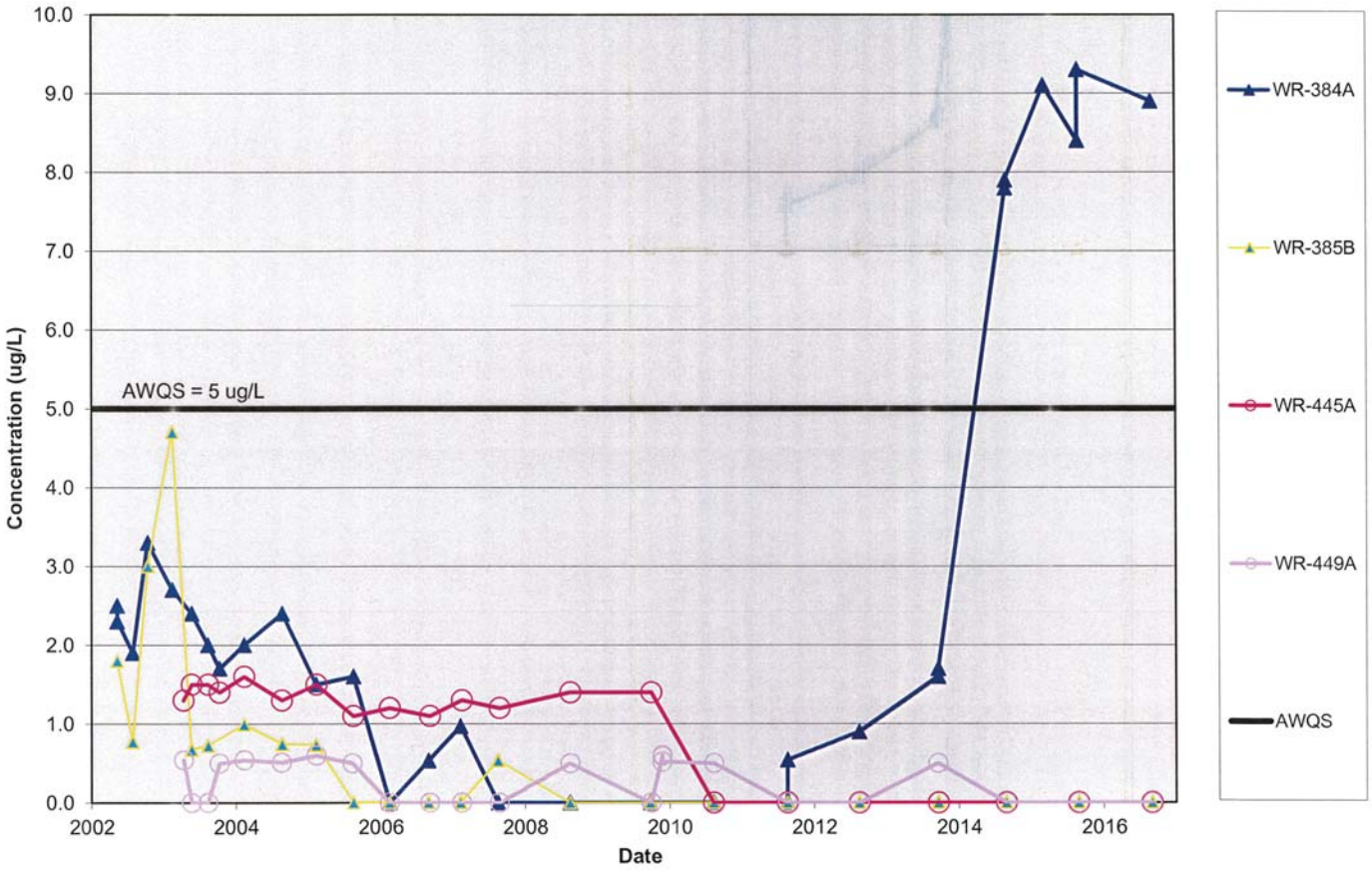
Drawn By:	LE
Checked:	AB
Approved:	TR
Date:	11/25/2016
File:	See Below

Figure 7
PCE Concentrations in Groundwater Monitor Wells
Tumamoc Landfill



Note: Deep wells are all non-detect for PCE.

Figure 8
TCE Concentrations in Groundwater Monitor Wells
Tumamoc Landfill



Note: Only wells with TCE detections are charted.

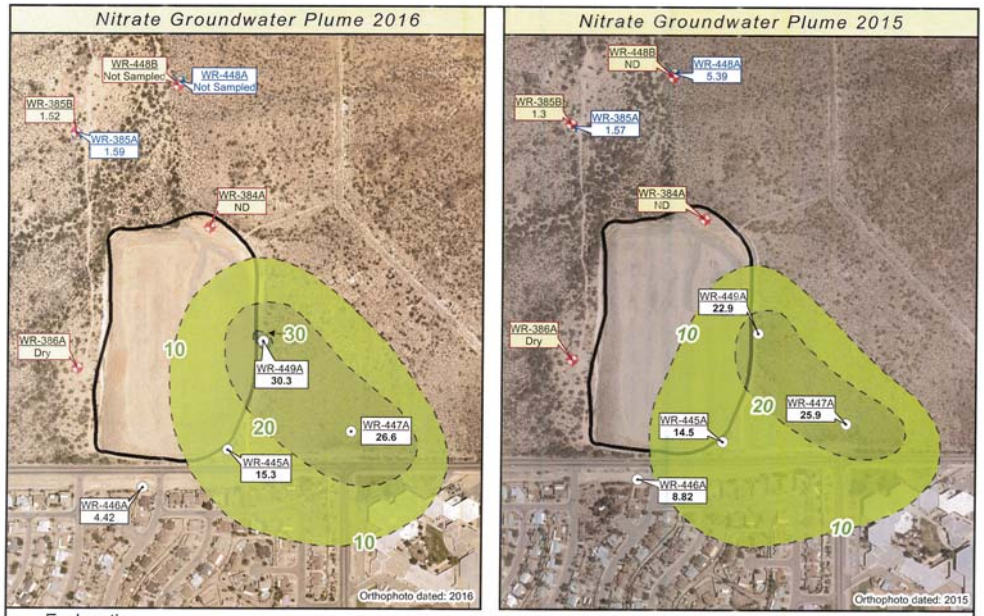
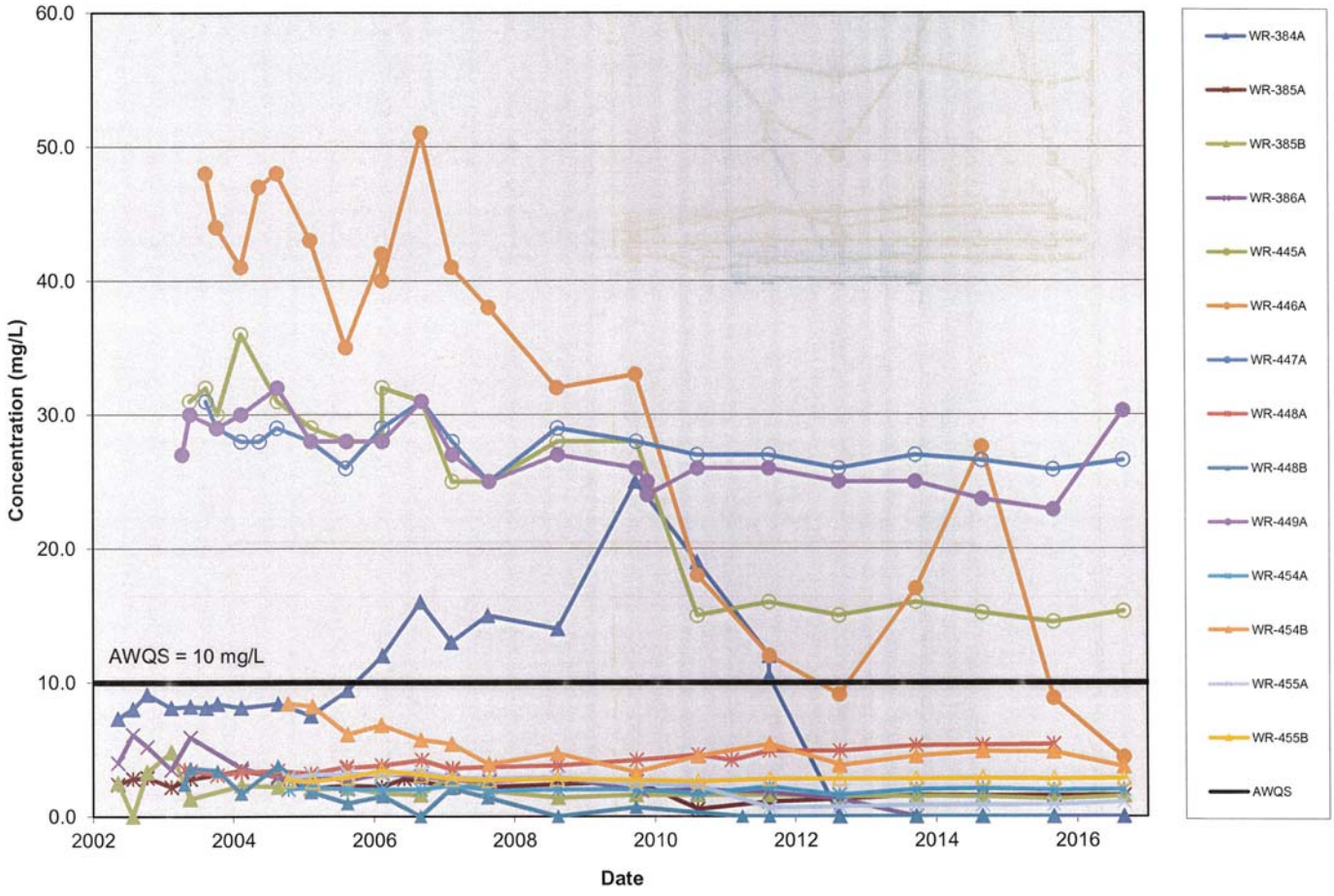

Nitrate Groundwater Plume 2016
WR-448B
Not Sampled
WR-448A
Not Sampled
WR-385B
1.52
WR-385A
1.59
WR-384A
ND
WR-386A
Dry
WR-449A
30.3
WR-447A
26.6
WR-445A
15.3
WR-446A
4.42
10
20
30
Orthophoto dated: 2016
Nitrate Groundwater Plume 2015
WR-448B
ND
WR-448A
5.39
WR-385B
1.3
WR-385A
1.57
WR-384A
ND
WR-449A
22.9
WR-386A
Dry
WR-447A
25.9
WR-445A
14.5
WR-446A
8.82
10
20
Orthophoto dated: 2015
Explanation
Groundwater Monitor Well
Shallow Screened Interval
Deep Screened Interval
Long Screened Interval
Landfill Boundary
Nitrate Concentrations
10 mg/L Boundary
20 mg/L Boundary
30 mg/L Boundary
All maps contain an estimated Nitrate plume boundary of 10, 20, and 30 mg/L where appropriate. 2015 - 2013 boundaries were also provided in previous monitoring reports. All maps are provided at the same scale: 1:6,000 absolute or 1 inch = 500 feet. ND = Nondetect.
0 250 500 1,000 Feet
N
Nitrate Groundwater Plume 2014
WR-448B
ND
WR-448A
5.3
WR-385B
1.5
WR-385A
1.6
WR-384A
ND
WR-449A
23.7
WR-386A
Dry
WR-447A
26.6
WR-445A
15.2
WR-446A
27.6
10
20
Orthophoto dated: 2014
Nitrate Groundwater Plume 2013
WR-448B
ND
WR-448A
5.3
WR-385B
1.5
WR-385A
1.6
WR-384A
ND
WR-386A
ND
WR-449A
25
WR-447A
27
WR-445A
16
WR-446A
17
10
20
Orthophoto dated: 2012
CITY OF TUCSON
ENVIRONMENTAL SERVICES
FIGURE 9
Nitrate Concentration Maps in Groundwater
Years 2013 - 2016
Tumamoc Landfill
Drawn By: LE
Checked: AB
Approved: TR
Date: 11/25/2016
File: See Below

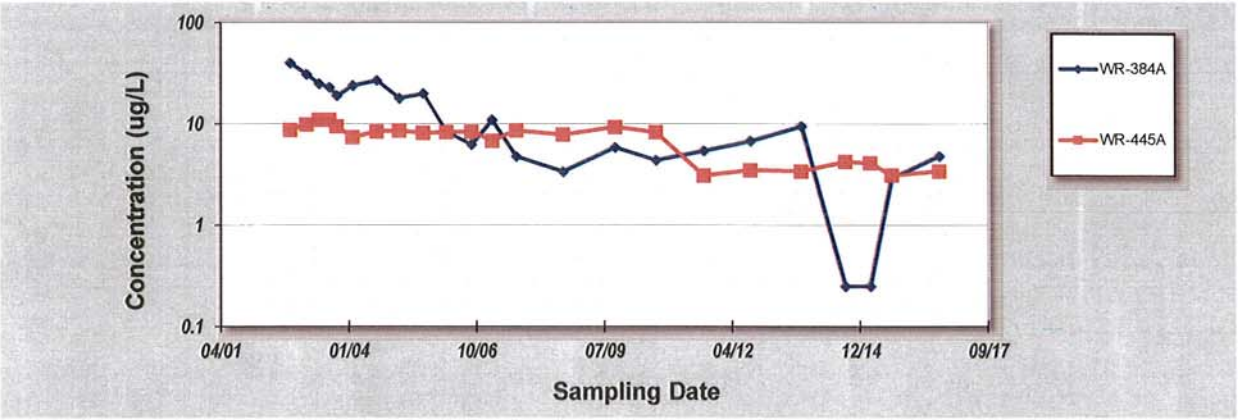
Figure 10
Nitrate Concentrations in Groundwater Monitor Wells
Tumamoc Landfill



GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	15-Nov-16	Job ID:	Figure 11
Facility Name:	Tumamoc Landfill	Constituent:	PCE
Conducted By:	Arturo Burgos	Concentration Units:	ug/L

Sampling Point ID:	WR-384A	WR-445A					
Sampling Event	Sampling Date	PCE CONCENTRATION (ug/L)					
1	10/08/02	40.0	8.7				
2	02/11/03	31.0	9.9				
3	05/20/03	25.0	11.0				
4	08/11/03	23.0	11.0				
5	10/07/03	19.0	9.5				
6	02/10/04	24.0	7.4				
7	08/17/04	27.0	8.5				
8	02/08/05	18.0	8.6				
9	08/16/05	20.0	8.2				
10	02/14/06	8.4	8.4				
11	08/29/06	6.3	8.5				
12	02/06/07	11.0	6.9				
13	08/15/07	4.8	8.7				
14	08/13/08	3.4	7.9				
15	09/23/09	5.9	9.4				
16	08/09/10	4.4	8.3				
17	08/17/11	5.4	3.1				
18	08/16/12	6.8	3.5				
19	09/18/13	9.5	3.4				
20	08/27/14	0.3	4.2				
21	03/09/15	0.3	4.1				
22	08/26/15	2.9	3.1				
23	08/31/16	4.8	3.4				
24							
25							
Coefficient of Variation:		0.84	0.37				
Mann-Kendall Statistic (S):		-177	-152				
Confidence Factor:		>99.9%	>99.9%				
Concentration Trend:		Decreasing	Decreasing				



Notes:

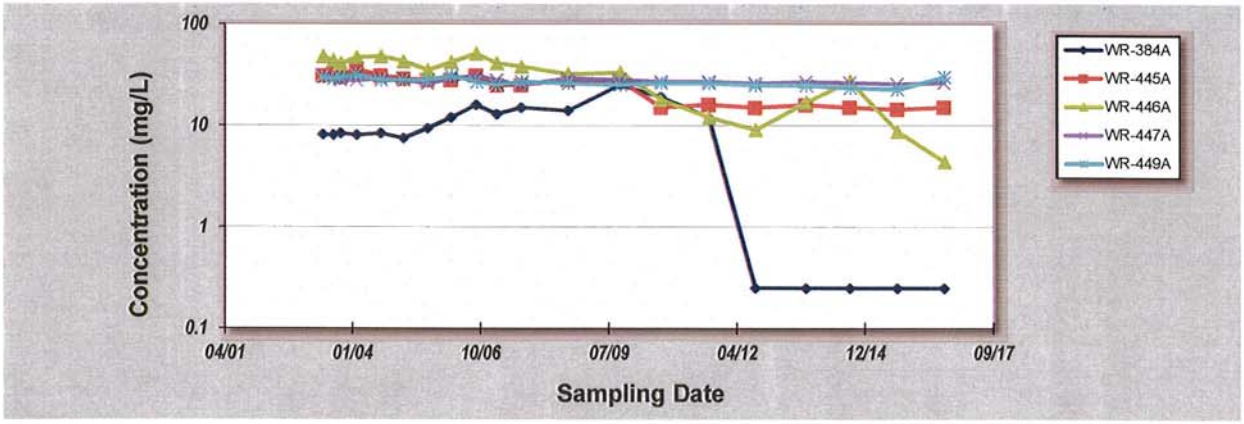
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Figure 11 Mann Kendall Trend Analysis

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	15-Nov-16	Job ID:	Figure 12
Facility Name:	Tumamoc Landfill	Constituent:	Nitrate
Conducted By:	Arturo Burgos	Concentration Units:	mg/L

Sampling Point ID:	WR-384A	WR-445A	WR-446A	WR-447A	WR-449A		
Sampling Event	Sampling Date	NITRATE CONCENTRATION (mg/L)						
1	5/20/2003	8.2	31.0	48.0	31.0	30.0		
2	8/11/2003	8.1	32.0	44.0	29.0	29.0		
3	10/7/2003	8.4	30.0	41.0	28.0	30.0		
4	2/10/2004	8.1	36.0	47.0	28.0	32.0		
5	8/17/2004	8.4	31.0	48.0	29.0	28.0		
6	2/8/2005	7.5	29.0	43.0	28.0	28.0		
7	8/16/2005	9.4	28.0	35.0	26.0	28.0		
8	2/14/2006	12.0	28.0	42.0	29.0	31.0		
9	8/29/2006	16.0	31.0	51.0	31.0	27.0		
10	2/6/2007	13.0	25.0	41.0	28.0	25.0		
11	8/15/2007	15.0	25.0	38.0	25.0	27.0		
12	8/13/2008	14.0	28.0	32.0	29.0	26.0		
13	9/23/2009	25.0	28.0	33.0	28.0	25.0		
14	8/9/2010	19.0	15.0	18.0	27.0	26.0		
15	8/17/2011	12.0	16.0	12.0	27.0	26.0		
16	8/16/2012	0.3	15.0	9.1	26.0	25.0		
17	9/18/2013	0.3	16.0	17.0	27.0	25.0		
18	8/27/2014	0.3	15.2	27.6	26.6	23.7		
19	9/1/2015	0.25	14.5	8.82	25.9	22.9		
20	8/31/2016	0.25	**15.3**	4.42	**26.6**	**30.3**		
21								
22								
23								
24								
25								
Coefficient of Variation:		0.74	0.30	0.47	0.06	0.09		
Mann-Kendall Statistic (S):		-11	-134	-138	-92	-110		
Confidence Factor:		62.6%	>99.9%	>99.9%	99.9%	>99.9%		
Concentration Trend:		Stable	Decreasing	Decreasing	Decreasing	Decreasing		



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

Figure 12 Mann Kendall Trend Analysis

APPENDIX A

Groundwater Analyte Lists for 2016

Project Name:	**Tumamoc Landfill**
Sample Points:	WR-384A, WR-385A, WR-385B, WR-386A, WR-445A, WR-446A, WR-447A, WR-449A, WR-454A, WR-454B, WR-455A, WR-455B

Samples Collected By:	Environmental Services
Sampling Frequency:	Annual Sampling (August)

Contact Person:	Arturo Burgos
Telephone:	(520) 837-3788

Reporting Frequency:	Annual
Reports Due:	VOCs 10 days; full report 30 days
Send Report To:	Lori Ehman

Required Field Parmeters	Methods	Lab
Conductivity	YSI	Field Staff
Temp	YSI	Field Staff
Turbidity	Hanna	Field Staff
pH	YSI	Field Staff

Parameter	Methods	Lab
Alkalinity (Bicarbonate)	SM 2320 B	TWQL
Ammonia	EPA 350.1	MWH
Arsenic	EPA 200.8	TWQL
Barium	EPA 200.7	TWQL
Calcium	EPA 200.7	TWQL
Iron	EPA 200.7	TWQL
Lead	EPA 200.8	TWQL
Magnesium	EPA 200.7	TWQL
Manganese	EPA 200.7	TWQL
Potassium	EPA 200.7	TWQL
Sodium	EPA 200.7	TWQL
Anions*	EPA 300.0	TWQL
TOC	SM 5310 D	TWQL
TDS	SM 2540 C	TWQL
VOCs	EPA 8260 (HCL)	TWQL

Matrix: Groundwater; Site: Wellhead; ADEQ Type: NONE
*Anion List: Nitrate, Nitrite, Sulfate, Fluoride, Chloride

APPENDIX B

Field Data Collection Sheets
For Groundwater Sampling

Correction Factor: -0.58

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: BAIL
TD: 100
D (diameter): 5
d factor: 2.83

Well Name: WR-384A
Project: Tumamoc Landfill
Date: Aug 31, 2016
Field Personnel: KV/LC
Weather: SUNNY/HOT
Static Water Level: 55.55 Time 8:00:00
Totalizer: End
Start
Sounder ID: SOL 3
Total (gal)
Sample Method: Bail
Well Volumes (gallons):
Discharge Rate(GPM):

1 45 1.5 68 2 91 2.5 113 3 136 3.5 159 4 181 4.5 204 5 227

Pump Time: Start
End
Total (min) 0
Meters and Type: X YS#1 ___ YSI#2 ___ YSI QS
Calibration Date: August 31, 2016

Parameters (Stable within) *+/-0.1* *+/-3%* *+/-3%* *+/-10%* *+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
45	0812	7.20	6807	26.09	3.91	87.1	-	55.9
91								
113								
136								
159								
181								
204								
227								

Sampling:

Samples Collected By: Kayla Virgone
Sample Time: 8:05:00
Dup Sample Time: N:/A
Time Ended: 8:10:00
Transferred To: TWQL
Relinquished by: Kayla Virgone
Relinquish Date: August 31, 2016
Reason for Sampling: Monthly ___ Quarterly ___ Semi-Annual ___ X Annual ___
GAC Treatment ___ Investigation ___ Duplicate ___

Comments:

Correction Factor: -0.83

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: BAIL
TD: 203
D (diameter): 5
d factor: 10.01

Well Name: WR-385A
Project: Tumamoc Landfill
Date: Aug 31, 2016
Field Personnel: KV/LC
Weather: SUNNY/HOT
Static Water Level: 45.99 Time 9:20:00
Totalizer: End
Sounder ID: SOL 3 Start
Sample Method: Bail Total (gal)
Well Volumes (gallons): Discharge Rate(GPM):

1 160 1.5 240 2 320 2.5 400 3 480 3.5 560 4 641 4.5 721 5 801

Pump Time: Start
End
Total (min) 0
Meters and Type: X YS#1 ____ YSI#2 ____ YSI QS
Calibration Date: August 31, 2016

Parameters (Stable within)	+/-0.1	+/-3%	+/-3%	+/-10%	+/-20 mv

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
160	0936	7.81	3117	26.44	4.24	78.8	-	1.28
320								
400								
480								
560								
641								
721								
801								

Sampling:

Samples Collected By: Kayla Virgone
Sample Time: 9:30:00
Dup Sample Time: N:/A
Time Ended: 9:35:00
Transferred To: TWQL
Relinquished by: Kayla Virgone
Relinquish Date: August 31, 2016
Reason for Sampling: ____ Monthly ____ Quarterly ____ Semi-Annual X Annual
____ GAC Treatment ____ Investigation ____ Duplicate

Comments:

Correction Factor: -0.91

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: BAIL
TD: 85
D (diameter): 5
d factor: 2.41

Well Name: WR-385B
Project: Tumamoc Landfill
Date: Aug 31, 2016
Field Personnel: KV/LC
Weather: SUNNY/HOT
Static Water Level: 47.24 Time 9:45:00
Totalizer: End
Start
Sounder ID: SOL 3
Total (gal)
Sample Method: Bail
Well Volumes (gallons):
Discharge Rate(GPM):

1 39 1.5 58 2 77 2.5 96 3 116 3.5 135 4 154 4.5 173 5 193

Pump Time: Start
End
Total (min) 0
Meters and Type: X YS#1 ___ YSI#2 ___ YSI QS
Calibration Date: August 31, 2016

Parameters (Stable within)	*+/-0.1*	*+/-3%*	*+/-3%*	*+/-10%*	*+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
39	0956	7.49	2084	25.55	5.73	94.5	-	6.54
77								
96								
116								
135								
154								
173								
193								

Sampling:

Samples Collected By: Kayla Virgone
Sample Time: 9:50:00
Dup Sample Time: N:/A
Time Ended: 9:55:00
Transferred To: TWQL
Relinquished by: Kayla Virgone
Relinquish Date: August 31, 2016
Reason for Sampling: Monthly ___ Quarterly ___ Semi-Annual ___ X Annual
GAC Treatment ___ Investigation ___ Duplicate ___

Comments:

Correction Factor -0.53

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP BAIL
TD 55
D (diameter) 5
d factor

Well Name: WR-386A
Project: Tumamoc Landfill
Date: Aug 31, 2016
Field Personnel: KV/LC
Weather: hot, windy
Static Water Level: Time
Totalizer: End
Sounder ID: SOL 3
Start
Sample Method:
Total (gal)
Well Volumes (gallons):
Discharge Rate(GPM):

1 1.5 2 2.5 3 3.5 4 4.5 5

Pump Time: Start
Meters and Type: YS#1 YSI#2 YSI QS
End
Total (min) 0
Calibration Date:

Parameters (Stable within) *+/-0.1* *+/-3%* *+/-3%* *+/-10%* *+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)

Sampling:

Samples Collected By: Kayla Virgone
Sample Time:
Dup Sample Time:
Time Ended:
Transferred To: TWQL
Relinquished by: Kayla Virgone
Relinquish Date: August 31, 2016
Reason for Sampling: Monthly Quarterly Semi-Annual X Annual
GAC Treatment Investigation Duplicate

Comments: NO SAMPLE- WELL WAS DRY AT 55FT.

Correction Factor: -0.73

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: BAIL
TD: 160
D (diameter): 5
d factor:

Well Name: WR-445A
Project: Tumamoc Landfill
Date: Aug 31, 2016
Field Personnel: KV/LC
Weather: SUNNY/HOT
Static Water Level: Time
Totalizer: End
Sounder ID: SOL 3
Start
Sample Method: Bail
Total (gal)
Well Volumes (gallons):
Discharge Rate(GPM):

1 ____ 1.5 ____ 2 ____ 2.5 ____ 3 ____ 3.5 ____ 4 ____ 4.5 ____ 5 ____

Pump Time: Start
Meters and Type: X YS#1 ____ YSI#2 ____ YSI QS
End
Total (min) 0
Calibration Date: August 31, 2016

Parameters (Stable within)	*+/-0.1*	*+/-3%*	*+/-3%*	*+/-10%*	*+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
	0846	7.70	1192	25.93	7.32	84.8	-	6.72

Sampling:

Samples Collected By: Kayla Virgone
Sample Time: 8:40:00
Dup Sample Time: N:/A
Time Ended: 8:45:00
Transferred To: TWQL
Relinquished by: Kayla Virgone
Relinquish Date: August 31, 2016

Reason for Sampling: Monthly ____ Quarterly ____ Semi-Annual ____ X Annual ____
GAC Treatment ____ Investigation ____ Duplicate ____

Comments:

Correction Factor: -0.53

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: Bail
TD: 199
D (diameter): 5
d factor: 9.97

Well Name: WR-446A
Project: Tumamoc Landfill
Date: Aug 30, 2016
Field Personnel: JM/LC
Weather: Sunny/Hot
Static Water Level: 42.59 Time 7:50:00
Totalizer: End
Start
Sounder ID: SOL 3
Total (gal)
Sample Method: Bail
Well Volumes (gallons):
Discharge Rate(GPM):

1 160 1.5 239 2 319 2.5 399 3 479 3.5 558 4 638 4.5 718 5 798

Pump Time: Start
End
Total (min) 0
Meters and Type: YS#1 X YSI#2 YSI QS
Calibration Date: August 30, 2016

Parameters (Stable within) +/-0.1 +/-3% +/-3% +/-10% +/-20 mv

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
160	0805	7.95	1099	25.90	7.08	48.5	*	1.4
319								
399								
479								
558								
638								
718								
798								

Sampling:

Samples Collected By: Luis Clark Sample Time: 8:00:00 Dup Sample Time: N:/A Time Ended: 8:05:00
Transferred To: TWQL Relinquished by: Luis Clark Relinquish Date: August 30, 2016
Reason for Sampling: Monthly Quarterly Semi-Annual X Annual
GAC Treatment Investigation Duplicate

Comments:

Correction Factor: -0.25

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: Bail
TD: 199
D (diameter): 5
d factor: 9.80

Well Name: WR-447A
Project: Tumamoc Landfill
Date: Aug 30, 2016
Field Personnel: JM/LC
Weather: Sunny/Hot
Static Water Level: 45.30 Time 7:15:00
Totalizer: End
Sounder ID: SOL 3 Start
Sample Method: Bail Total (gal)
Well Volumes (gallons): Discharge Rate(GPM):

1 157 1.5 235 2 314 2.5 392 3 470 3.5 549 4 627 4.5 705 5 784

Pump Time: Start
End
Total (min) 0
Meters and Type: YS#1 X YSI#2 YSI QS
Calibration Date: August 30, 2016

Parameters (Stable within)	*+/-0.1*	*+/-3%*	*+/-3%*	*+/-10%*	*+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
157	0730	8.20	1612	25.14	6.47	24.5	*	1.7
314								
392								
470								
549								
627								
705								
784								

Sampling:

Samples Collected By: Luis Clark Sample Time: 7:30:00 Dup Sample Time: N:/A Time Ended: 7:35:00
Transferred To: TWQL Relinquished by: Luis Clark Relinquish Date: August 30, 2016
Reason for Sampling: Monthly Quarterly Semi-Annual X Annual
GAC Treatment Investigation Duplicate

Comments:

Correction Factor: -0.7

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: BAIL
TD: 200
D (diameter): 5
d factor: 9.02

Well Name: WR-449A
Project: Tumamoc Landfill
Date: Aug 31, 2016
Field Personnel: KV/LC
Weather: SUNNY/HOT
Static Water Level: 58.51 Time 7:34:00
Totalizer: End
Start
Sounder ID: SOL 3
Total (gal)
Sample Method: Bail
Well Volumes (gallons):
Discharge Rate(GPM):

1 144 1.5 216 2 289 2.5 361 3 433 3.5 505 4 577 4.5 649 5 722

Pump Time: Start
End
Total (min) 0
Meters and Type: X YS#1 ___ YSI#2 ___ YSI QS
Calibration Date: August 31, 2016

Parameters (Stable within) *+/-0.1* *+/-3%* *+/-3%* *+/-10%* *+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
144	0752	8.21	1700	25.11	5.70	-0.5	-	8.2
289								
361								
433								
505								
577								
649								
722								

Sampling:

Samples Collected By: Kayla Virgone
Sample Time: 7:45:00
Dup Sample Time: N:/A
Time Ended: 7:50:00
Transferred To: TWQL
Relinquished by: Kayla Virgone
Relinquish Date: August 31, 2016
Reason for Sampling: Monthly ___ Quarterly ___ Semi-Annual ___ X Annual ___
GAC Treatment ___ Investigation ___ Duplicate ___

Comments:

Correction Factor: -0.75

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: Bail
TD: 240
D (diameter): 5
d factor: 13.76

Well Name: WR-454A
Project: Tumamoc Landfill
Date: Aug 30, 2016
Field Personnel: JM/LC
Weather: Sunny/Hot
Static Water Level: 24.21 Time 9:50:00
Totalizer: End
Start
Sounder ID: SOL 3
Total (gal)
Sample Method: Bail
Well Volumes (gallons):
Discharge Rate(GPM):

1 220 1.5 330 2 440 2.5 550 3 660 3.5 770 4 880 4.5 990 5 1100

Pump Time: Start
End
Total (min) 0
Meters and Type: X YS#1 ____ YSI#2 ____ YSI QS
Calibration Date: August 30, 2016

Parameters (Stable within) *+/-0.1* *+/-3%* *+/-3%* *+/-10%* *+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
	1006	8.65	767	30.52	6.61	49.2	*	2.7
440								
550								
660								
770								
880								
990								
1100								

Sampling:

Samples Collected By: Luis Clark
Sample Time: 10:00:00
Dup Sample Time: 10:05:00
Time Ended: 10:08:00
Transferred To: TWQL
Relinquished by: Luis Clark
Relinquish Date: August 30, 2016
Reason for Sampling: Monthly ____ Quarterly ____ Semi-Annual ____ X Annual
GAC Treatment ____ Investigation ____ Duplicate ____

Comments:

Correction Factor: -0.75

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: Bail
TD: 240
D (diameter): 5
d factor: 14.44

Well Name: WR-454B
Project: Tumamoc Landfill
Date: Aug 30, 2016
Field Personnel: JM/LC
Weather: Sunny/Hot
Static Water Level: 13.55 Time 8:15:00
Totalizer: End
Sounder ID: SOL 3 Start
Sample Method: Bail Total (gal)
Well Volumes (gallons): Discharge Rate(GPM):

1 231 1.5 346 2 462 2.5 577 3 693 3.5 808 4 924 4.5 1039 5 1155

Pump Time: Start
End
Total (min) 0
Meters and Type: YS#1 X YSI#2 YSI QS
Calibration Date: August 30, 2016

Parameters (Stable within) *+/-0.1* *+/-3%* *+/-3%* *+/-10%* *+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
231	0826	7.80	1608	28.07	4.00	78.8	*	1.2
462								
577								
693								
808								
924								
1039								
1155								

Sampling:

Samples Collected By: Luis Clark Sample Time: 8:25:00 Dup Sample Time: N:/A Time Ended: 8:29:00

Transferred To: TWQL Relinquished by: Luis Clark Relinquish Date: August 30, 2016

Reason for Sampling: Monthly Quarterly Semi-Annual X Annual

GAC Treatment Investigation Duplicate

Comments:

Correction Factor: -0.52

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: Bail
TD: 240
D (diameter): 5
d factor: 13.95

Well Name: WR-455A
Project: Tumamoc Landfill
Date: Aug 30, 2016
Field Personnel: LC/JM
Weather: Sunny/Hot
Static Water Level: 21.15 Time 8:40:00
Totalizer: End
Sounder ID: SOL 3 Start
Sample Method: Bail Total (gal)
Well Volumes (gallons): Discharge Rate(GPM):

1 223 1.5 335 2 446 2.5 558 3 670 3.5 781 4 893 4.5 1004 5 1116

Pump Time: Start
End
Total (min) 0
Meters and Type: YS#1 X YSI#2 YSI QS
Calibration Date: August 30, 2016

Parameters (Stable within) *+/-0.1* *+/-3%* *+/-3%* *+/-10%* *+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
223	0901	8.50	936	26.17	26.14	49.1	*	2.6
446								
558								
670								
781								
893								
1004								
1116								

Sampling:

Samples Collected By: Luis Clark Sample Time: 9:00:00 Dup Sample Time: N:/A Time Ended: 9:03:00
Transferred To: TWQL Relinquished by: Luis Clark Relinquish Date: August 30, 2016
Reason for Sampling: Monthly Quarterly Semi-Annual X Annual
GAC Treatment Investigation Duplicate

Comments:

Correction Factor: -0.49

CITY OF TUCSON
Environmental Services
Sampling Data Form

HP: Bail
TD: 100
D (diameter): 5
d factor: 4.94

Well Name: WR-455B
Project: Tumamoc Landfill
Date: Aug 30, 2016
Field Personnel: JM/LC
Weather: Sunny/Hot
Static Water Level: 22.50 Time 9:10:00
Totalizer: End
Start
Sounder ID: SOL 3
Total (gal)
Sample Method: Bail
Well Volumes (gallons):
Discharge Rate(GPM):

1 79 1.5 119 2 158 2.5 198 3 237 3.5 277 4 316 4.5 356 5 395

Pump Time: Start
End
Total (min) 0
Meters and Type: YS#1 X YSI#2 YSI QS
Calibration Date: August 30, 2016

Parameters (Stable within) *+/-0.1* *+/-3%* *+/-3%* *+/-10%* *+/-20 mv*

Gallons	Time (hrs)	pH	SpC (uS/cm)	Temp (C)	DO (mg/L)	ORP	PWL (feet)	Turbidity (NTU)
79	0930	7.70	921	26.08	6.00	101.9	*	3.1
158								
198								
237								
277								
316								
356								
395								

Sampling:

Samples Collected By: Luis Clark Sample Time: 9:25:00 Dup Sample Time: N:/A Time Ended: 9:28:00
Transferred To: TWQL Relinquished by: Luis Clark Relinquish Date: August 30, 2016
Reason for Sampling: Monthly Quarterly Semi-Annual X Annual
GAC Treatment Investigation Duplicate

Comments:

APPENDIX C

Duplicate Comparison Spreadsheet and Laboratory Analytical Reports for Groundwater Samples

Appendix C
Duplicate Comparison-Relative Percent Difference (RPD) -2016
Tumamoc Landfill, Tucson Arizona

Login	Well ID	Sample Date	Parameter	Prefix	Result	Login	Well ID	Sample Date	Parameter	Prefix	Result	RPD
L161077-06	WR-454A	08/30/2016 10:00	1,1,1,2-TETRACHLOROETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,1,1,2-TETRACHLOROETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,1,1-TRICHLOROETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,1,1-TRICHLOROETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,1,2,2-TETRACHLOROETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,1,2,2-TETRACHLOROETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,1,2-TRICHLOROETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,1,2-TRICHLOROETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,1-DICHLOROETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,1-DICHLOROETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,1-DICHLOROETHENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,1-DICHLOROETHENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,1-DICHLOROPROPENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,1-DICHLOROPROPENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2,3-TRICHLOROBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2,3-TRICHLOROBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2,3-TRICHLOROPROPANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2,3-TRICHLOROPROPANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2,4-TRICHLOROBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2,4-TRICHLOROBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2,4-TRIMETHYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2,4-TRIMETHYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2-DIBROMO-3-CHLOROPROPANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2-DIBROMO-3-CHLOROPROPANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2-DICHLOROBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2-DICHLOROBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2-DICHLOROETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2-DICHLOROETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,2-DICHLOROPROPANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,2-DICHLOROPROPANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,3,5-TRIMETHYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,3,5-TRIMETHYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,3-DICHLOROBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,3-DICHLOROBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,3-DICHLOROPROPANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,3-DICHLOROPROPANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	1,4-DICHLOROBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	1,4-DICHLOROBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	2,2-DICHLOROPROPANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	2,2-DICHLOROPROPANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	2-CHLOROTOLUENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	2-CHLOROTOLUENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	4-CHLOROTOLUENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	4-CHLOROTOLUENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	4-ISOPROPYLTOLUENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	4-ISOPROPYLTOLUENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	ALKALINITY, BICARBONATE		281	L161077-07	WR-454A	08/30/2016 10:05	ALKALINITY, BICARBONATE		284	1.1%
L161077-06	WR-454A	08/30/2016 10:00	ALKALINITY, CARBONATE		26.3	L161077-07	WR-454A	08/30/2016 10:05	ALKALINITY, CARBONATE		28.2	7.0%
L161077-06	WR-454A	08/30/2016 10:00	ALKALINITY, TOTAL		308	L161077-07	WR-454A	08/30/2016 10:05	ALKALINITY, TOTAL		312	1.3%
L161077-06	WR-454A	08/30/2016 10:00	AMMONIA AS N	<	0.05	L161077-07	WR-454A	08/30/2016 10:05	AMMONIA AS N	<	0.05	0.0%
L161077-06	WR-454A	08/30/2016 10:00	ARSENIC, TOTAL		0.00296	L161077-07	WR-454A	08/30/2016 10:05	ARSENIC, TOTAL		0.00295	-0.3%
L161077-06	WR-454A	08/30/2016 10:00	BARIUM, TOTAL		0.0395	L161077-07	WR-454A	08/30/2016 10:05	BARIUM, TOTAL		0.0384	2.8%
L161077-06	WR-454A	08/30/2016 10:00	BENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	BENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	BROMIDE		0.292	L161077-07	WR-454A	08/30/2016 10:05	BROMIDE		0.293	0.3%
L161077-06	WR-454A	08/30/2016 10:00	BROMOBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	BROMOBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	BROMOCHLOROMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	BROMOCHLOROMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	BROMODICHLOROMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	BROMODICHLOROMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	BROMOFORM	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	BROMOFORM	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	BROMOMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	BROMOMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CALCIUM, TOTAL		7.87	L161077-07	WR-454A	08/30/2016 10:05	CALCIUM, TOTAL		7.55	4.2%
L161077-06	WR-454A	08/30/2016 10:00	CARBON TETRACHLORIDE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	CARBON TETRACHLORIDE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CHLORIDE		31.8	L161077-07	WR-454A	08/30/2016 10:05	CHLORIDE		31.8	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CHLOROBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	CHLOROBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CHLOROETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	CHLOROETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CHLOROFORM	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	CHLOROFORM	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CHLOROMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	CHLOROMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CIS-1,2-DICHLOROETHENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	CIS-1,2-DICHLOROETHENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	CIS-1,3-DICHLOROPROPENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	CIS-1,3-DICHLOROPROPENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	DIBROMOCHLOROMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	DIBROMOCHLOROMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	DIBROMOMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	DIBROMOMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	DICHLORODIFLUOROMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	DICHLORODIFLUOROMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	DICHLOROMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	DICHLOROMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	ETHYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	ETHYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	ETHYLENE DIBROMIDE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	ETHYLENE DIBROMIDE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	FLUORIDE		0.850	L161077-07	WR-454A	08/30/2016 10:05	FLUORIDE		0.854	0.5%
L161077-06	WR-454A	08/30/2016 10:00	HEXACHLOROBUTADIENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	HEXACHLOROBUTADIENE	<	0.0005	0.0%
L161077-06	**WR-454A**	**08/30/2016 10:00**	**IRON, TOTAL**		**0.502**	**L161077-07**	**WR-454A**	**08/30/2016 10:05**	**IRON, TOTAL**		**0.110**	**128.1%**

Appendix C
Duplicate Comparison-Relative Percent Difference (RPD) -2016
Tumamoc Landfill, Tucson Arizona

Login	Well ID	Sample Date	Parameter	Prefix	Result	Login	Well ID	Sample Date	Parameter	Prefix	Result	RPD
L161077-06	WR-454A	08/30/2016 10:00	ISOPROPYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	ISOPROPYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	LEAD, TOTAL	<	0.001	L161077-07	WR-454A	08/30/2016 10:05	LEAD, TOTAL	<	0.001	0.0%
L161077-06	WR-454A	08/30/2016 10:00	M/P-XYLENES	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	M/P-XYLENES	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	MAGNESIUM, TOTAL		4.12	L161077-07	WR-454A	08/30/2016 10:05	MAGNESIUM, TOTAL		4.12	0.0%
L161077-06	WR-454A	08/30/2016 10:00	MANGANESE, TOTAL	<	0.02	L161077-07	WR-454A	08/30/2016 10:05	MANGANESE, TOTAL	<	0.02	0.0%
L161077-06	WR-454A	08/30/2016 10:00	METHYL-TERT-BUTYL ETHER	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	METHYL-TERT-BUTYL ETHER	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	NAPHTHALENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	NAPHTHALENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	N-BUTYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	N-BUTYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	NITRATE AS N		2.00	L161077-07	WR-454A	08/30/2016 10:05	NITRATE AS N		2.00	0.0%
L161077-06	WR-454A	08/30/2016 10:00	NITRITE AS N	<	0.1	L161077-07	WR-454A	08/30/2016 10:05	NITRITE AS N	<	0.1	0.0%
L161077-06	WR-454A	08/30/2016 10:00	N-PROPYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	N-PROPYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	ORTHO PHOSPHATE AS P	<	0.2	L161077-07	WR-454A	08/30/2016 10:05	ORTHO PHOSPHATE AS P	<	0.2	0.0%
L161077-06	WR-454A	08/30/2016 10:00	ORTHO-XYLENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	ORTHO-XYLENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	POTASSIUM, TOTAL		1.39	L161077-07	WR-454A	08/30/2016 10:05	POTASSIUM, TOTAL		1.41	1.4%
L161077-06	WR-454A	08/30/2016 10:00	SEC-BUTYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	SEC-BUTYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	SODIUM, TOTAL		169	L161077-07	WR-454A	08/30/2016 10:05	SODIUM, TOTAL		171	1.2%
L161077-06	WR-454A	08/30/2016 10:00	STYRENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	STYRENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	SULFATE		35.5	L161077-07	WR-454A	08/30/2016 10:05	SULFATE		35.6	0.3%
L161077-06	WR-454A	08/30/2016 10:00	TERT-BUTYLBENZENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TERT-BUTYLBENZENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	TETRACHLOROETHENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TETRACHLOROETHENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	TOLUENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TOLUENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	TOTAL DISSOLVED SOLIDS		443	L161077-07	WR-454A	08/30/2016 10:05	TOTAL DISSOLVED SOLIDS		450	1.6%
L161077-06	WR-454A	08/30/2016 10:00	TOTAL ORGANIC CARBON		0.31	L161077-07	WR-454A	08/30/2016 10:05	TOTAL ORGANIC CARBON	<	0.25	21.4%
L161077-06	WR-454A	08/30/2016 10:00	TOTAL TRIHALOMETHANES	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TOTAL TRIHALOMETHANES	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	TRANS-1,2-DICHLOROETHENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TRANS-1,2-DICHLOROETHENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	TRANS-1,3-DICHLOROPROPENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TRANS-1,3-DICHLOROPROPENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	TRICHLOROETHENE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TRICHLOROETHENE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	TRICHLOROFLUOROMETHANE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	TRICHLOROFLUOROMETHANE	<	0.0005	0.0%
L161077-06	WR-454A	08/30/2016 10:00	VINYL CHLORIDE	<	0.0005	L161077-07	WR-454A	08/30/2016 10:05	VINYL CHLORIDE	<	0.0005	0.0%

4401 S. Tucson Estates Parkway
Tucson, Arizona 85735
520.791.2544 Phone
520.791.5260 Fax

26 September 2016

Arturo Burgos

Environmental Services

-

Tucson, AZ 85735

RE: Tumamoc Landfill

Enclosed are the results for Work Order L161077, received by the laboratory on 08/30/2016 13:03. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michael E. Dew
Lab Manager

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WR-447A	L161077-01	Aqueous	08/30/2016 07:30	08/30/2016 13:03
WR-446A	L161077-02	Aqueous	08/30/2016 08:00	08/30/2016 13:03
WR-454B	L161077-03	Aqueous	08/30/2016 08:25	08/30/2016 13:03
WR-455A	L161077-04	Aqueous	08/30/2016 09:00	08/30/2016 13:03
WR-455B	L161077-05	Aqueous	08/30/2016 09:25	08/30/2016 13:03
WR-454A	L161077-06	Aqueous	08/30/2016 10:00	08/30/2016 13:03
WR-454A	L161077-07	Aqueous	08/30/2016 10:05	08/30/2016 13:03
TRIP BLANK	L161077-08	Aqueous	08/30/2016 07:30	08/30/2016 13:03

All QC results wre within QC limits.

Tucson Water Quality Laboratory

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Michael E. Dew, Lab Manager

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-447A

L161077-01 (Aqueous)

Sampled: 08/30/2016 7:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-447A

L161077-01 (Aqueous)

Sampled: 08/30/2016 7:30

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	**0.0010**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	**0.0005**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-447A

L161077-01 (Aqueous)

Sampled: 08/30/2016 7:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	**0.0020**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*90 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*98 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*101 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-447A

L161077-01 (Aqueous)

Sampled: 08/30/2016 7:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0894**	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
CALCIUM	**39.5**	2.00	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
IRON	**0.369**	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
MAGNESIUM	**20.9**	0.500	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
POTASSIUM	**10.3**	0.500	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
Total Metals by ICPMS									
LEAD	**0.00236**	0.00100	mg/L	1	BI61502	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**247**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**247**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**2.37**	0.100	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
FLUORIDE	**1.31**	0.100	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
SULFATE	**114**	5.00	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**939**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.56**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-447A

L161077-01RE1 (Aqueous)

Sampled: 08/30/2016 7:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
SODIUM	**269**	20.0	mg/L	10	BI60906	09/08/2016	09/09/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.0103**	0.00200	mg/L	2	BI61503	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
CHLORIDE	**214**	15.0	mg/L	5	BH63111	08/30/2016	08/30/2016	EPA 300.0	
NITRATE AS N	**26.6**	1.25	mg/L	5	BH63111	08/30/2016	08/30/2016	EPA 300.0	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-446A

L161077-02 (Aqueous)

Sampled: 08/30/2016 8:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-446A

L161077-02 (Aqueous)

Sampled: 08/30/2016 8:00

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-446A

L161077-02 (Aqueous)

Sampled: 08/30/2016 8:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*94 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*100 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*99 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-446A

L161077-02 (Aqueous)

Sampled: 08/30/2016 8:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0733**	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
CALCIUM	**25.2**	2.00	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
IRON	**0.0929**	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
MAGNESIUM	**22.4**	0.500	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
POTASSIUM	**10.4**	0.500	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
SODIUM	**185**	2.00	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
Total Metals by ICPMS									
LEAD	ND	0.00100	mg/L	1	BI61503	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**301**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**301**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**0.316**	0.100	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
CHLORIDE	**75.1**	3.00	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
FLUORIDE	**0.969**	0.100	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
NITRATE AS N	**4.42**	0.250	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
SULFATE	**149**	5.00	mg/L	1	BH63111	08/30/2016	08/30/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**707**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.93**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-446A

L161077-02RE1 (Aqueous)

Sampled: 08/30/2016 8:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICPMS									
ARSENIC	**0.0241**	0.00200	mg/L	2	BI61502	09/08/2016	09/13/2016	EPA 200.8	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454B

L161077-03 (Aqueous)

Sampled: 08/30/2016 8:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454B

L161077-03 (Aqueous)

Sampled: 08/30/2016 8:25

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454B

L161077-03 (Aqueous)

Sampled: 08/30/2016 8:25

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*89 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*99 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*99 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454B

L161077-03 (Aqueous)

Sampled: 08/30/2016 8:25

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0517**	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
CALCIUM	**41.8**	2.00	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
IRON	**0.0218**	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
MAGNESIUM	**29.6**	0.500	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
POTASSIUM	**2.17**	0.500	mg/L	1	BI60906	09/08/2016	09/09/2016	EPA 200.7	
Total Metals by ICPMS									
LEAD	ND	0.00100	mg/L	1	BI61502	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**352**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**352**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**1.46**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
FLUORIDE	**0.808**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRATE AS N	**3.71**	0.250	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
SULFATE	**184**	5.00	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**963**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.94**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454B

L161077-03RE1 (Aqueous)

Sampled: 08/30/2016 8:25

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
SODIUM	**296**	20.0	mg/L	10	BI60906	09/08/2016	09/09/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.00635**	0.00200	mg/L	2	BI61502	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
CHLORIDE	**198**	15.0	mg/L	5	BH63112	08/30/2016	08/30/2016	EPA 300.0	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455A

L161077-04 (Aqueous)

Sampled: 08/30/2016 9:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455A

L161077-04 (Aqueous)

Sampled: 08/30/2016 9:00

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455A

L161077-04 (Aqueous)

Sampled: 08/30/2016 9:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*92 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*101 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*99 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455A

L161077-04 (Aqueous)

Sampled: 08/30/2016 9:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0215**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**9.56**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**13.9**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**1.81**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
SODIUM	**183**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.0152**	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**205**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**205**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**0.690**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
CHLORIDE	**80.0**	3.00	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
FLUORIDE	**0.964**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRATE AS N	**1.07**	0.250	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
SULFATE	**145**	5.00	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**556**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.35**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455B

L161077-05 (Aqueous)

Sampled: 08/30/2016 9:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455B

L161077-05 (Aqueous)

Sampled: 08/30/2016 9:25

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455B

L161077-05 (Aqueous)

Sampled: 08/30/2016 9:25

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*91 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*97 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*100 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-455B

L161077-05 (Aqueous)

Sampled: 08/30/2016 9:25

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0708**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**33.9**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**23.0**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**1.81**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
SODIUM	**148**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.0112**	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**321**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**321**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**0.526**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
CHLORIDE	**64.6**	3.00	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
FLUORIDE	**0.657**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRATE AS N	**2.83**	0.250	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
SULFATE	**72.3**	5.00	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**581**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.28**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-06 (Aqueous)

Sampled: 08/30/2016 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-06 (Aqueous)

Sampled: 08/30/2016 10:00

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-06 (Aqueous)

Sampled: 08/30/2016 10:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*90 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*101 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*101 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-06 (Aqueous)

Sampled: 08/30/2016 10:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0395**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**7.87**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	**0.502**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**4.12**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**1.39**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
SODIUM	**169**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.00296**	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**281**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, CARBONATE	**26.3**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**308**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**0.292**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
CHLORIDE	**31.8**	3.00	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
FLUORIDE	**0.850**	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRATE AS N	**2.00**	0.250	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
SULFATE	**35.5**	5.00	mg/L	1	BH63112	08/30/2016	08/30/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**443**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-06 (Aqueous)

Sampled: 08/30/2016 10:00

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Wet Chemistry									
TOTAL ORGANIC CARBON	**0.31**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-07 (Aqueous)

Sampled: 08/30/2016 10:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-07 (Aqueous)

Sampled: 08/30/2016 10:05

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-07 (Aqueous)

Sampled: 08/30/2016 10:05

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*91 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*102 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*100 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-07 (Aqueous)

Sampled: 08/30/2016 10:05

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0384**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**7.55**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	**0.110**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**4.12**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**1.41**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
SODIUM	**171**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.00295**	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**284**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, CARBONATE	**28.2**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**312**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**0.293**	0.100	mg/L	1	BH63112	08/31/2016	08/31/2016	EPA 300.0	
CHLORIDE	**31.8**	3.00	mg/L	1	BH63112	08/31/2016	08/31/2016	EPA 300.0	
FLUORIDE	**0.854**	0.100	mg/L	1	BH63112	08/31/2016	08/31/2016	EPA 300.0	
NITRATE AS N	**2.00**	0.250	mg/L	1	BH63112	08/31/2016	08/31/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BH63112	08/31/2016	08/31/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BH63112	08/31/2016	08/31/2016	EPA 300.0	
SULFATE	**35.6**	5.00	mg/L	1	BH63112	08/31/2016	08/31/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**450**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

WR-454A

L161077-07 (Aqueous)

Sampled: 08/30/2016 10:05

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Wet Chemistry									
TOTAL ORGANIC CARBON	ND	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

TRIP BLANK

L161077-08 (Aqueous)

Sampled: 08/30/2016 7:30

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

TRIP BLANK

L161077-08 (Aqueous)

Sampled: 08/30/2016 7:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

TRIP BLANK

L161077-08 (Aqueous)

Sampled: 08/30/2016 7:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*95 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*102 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*100 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BH63103-BLK1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L							
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L							
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L							
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L							
1,1-DICHLOROETHANE	ND	0.0005	mg/L							
1,1-DICHLOROETHENE	ND	0.0005	mg/L							
1,1-DICHLOROPROPENE	ND	0.0005	mg/L							
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L							
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L							
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L							
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L							
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L							
1,2-DICHLOROBENZENE	ND	0.0005	mg/L							
1,2-DICHLOROETHANE	ND	0.0005	mg/L							
1,2-DICHLOROPROPANE	ND	0.0005	mg/L							
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L							
1,3-DICHLOROBENZENE	ND	0.0005	mg/L							
1,3-DICHLOROPROPANE	ND	0.0005	mg/L							
1,4-DICHLOROBENZENE	ND	0.0005	mg/L							
2,2-DICHLOROPROPANE	ND	0.0005	mg/L							
2-CHLOROTOLUENE	ND	0.0005	mg/L							
4-CHLOROTOLUENE	ND	0.0005	mg/L							
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L							
BENZENE	ND	0.0005	mg/L							
BROMOBENZENE	ND	0.0005	mg/L							

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BH63103-BLK1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	ND	0.0005	mg/L							
BROMODICHLOROMETHANE	ND	0.0005	mg/L							
BROMOFORM	ND	0.0005	mg/L							
BROMOMETHANE	ND	0.0005	mg/L							
CARBON TETRACHLORIDE	ND	0.0005	mg/L							
CHLOROBENZENE	ND	0.0005	mg/L							
CHLOROETHANE	ND	0.0005	mg/L							
CHLOROFORM	ND	0.0005	mg/L							
CHLOROMETHANE	ND	0.0005	mg/L							
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L							
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L							
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L							
DIBROMOMETHANE	ND	0.0005	mg/L							
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L							
DICHLOROMETHANE	ND	0.0005	mg/L							
ETHYLBENZENE	ND	0.0005	mg/L							
ETHYLENE DIBROMIDE	ND	0.0005	mg/L							
HEXACHLOROBUTADIENE	ND	0.0005	mg/L							
ISOPROPYLBENZENE	ND	0.0005	mg/L							
M/P-XYLENES	ND	0.0005	mg/L							
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L							
NAPHTHALENE	ND	0.0005	mg/L							
N-BUTYLBENZENE	ND	0.0005	mg/L							
N-PROPYLBENZENE	ND	0.0005	mg/L							
ORTHO-XYLENE	ND	0.0005	mg/L							
SEC-BUTYLBENZENE	ND	0.0005	mg/L							

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BH63103-BLK1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	ND	0.0005	mg/L							
TERT-BUTYLBENZENE	ND	0.0005	mg/L							
TETRACHLOROETHENE	ND	0.0005	mg/L							
TOLUENE	ND	0.0005	mg/L							
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L							
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L							
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L							
TRICHLOROETHENE	ND	0.0005	mg/L							
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L							
VINYL CHLORIDE	ND	0.0005	mg/L							
XYLENES (TOTAL)	ND	0.0005	mg/L							
Surrogate: BROMOFLUOROBENZENE (SURR.)	*4.79*		ug/L	*5.00*		*96*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*4.99*		ug/L	*5.00*		*100*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.94*		ug/L	*5.00*		*99*	*70-130*			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BH63103-MS1)	**Source: L161087-01**		Prepared & Analyzed: 08/31/2016							
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	4.93		ug/L	5.00	ND	99	70-130			
1,1,1-TRICHLOROETHANE	5.37		ug/L	5.00	ND	107	70-130			
1,1,2,2-TETRACHLOROETHANE	4.70		ug/L	5.00	ND	94	70-130			
1,1,2-TRICHLOROETHANE	5.10		ug/L	5.00	ND	102	70-130			
1,1-DICHLOROETHANE	5.78		ug/L	5.00	0.280	110	70-130			
1,1-DICHLOROETHENE	5.28		ug/L	5.00	ND	106	70-130			
1,1-DICHLOROPROPENE	5.37		ug/L	5.00	ND	107	70-130			
1,2,3-TRICHLOROBENZENE	5.28		ug/L	5.00	ND	106	70-130			
1,2,3-TRICHLOROPROPANE	4.68		ug/L	5.00	ND	94	70-130			
1,2,4-TRICHLOROBENZENE	5.27		ug/L	5.00	ND	105	70-130			
1,2,4-TRIMETHYLBENZENE	5.14		ug/L	5.00	ND	103	70-130			
1,2-DIBROMO-3-CHLOROPROPANE	4.71		ug/L	5.00	ND	94	70-130			
1,2-DICHLOROBENZENE	5.34		ug/L	5.00	ND	107	70-130			
1,2-DICHLOROETHANE	5.15		ug/L	5.00	ND	103	70-130			
1,2-DICHLOROPROPANE	5.14		ug/L	5.00	ND	103	70-130			
1,3,5-TRIMETHYLBENZENE	5.11		ug/L	5.00	ND	102	70-130			
1,3-DICHLOROBENZENE	5.32		ug/L	5.00	ND	106	70-130			
1,3-DICHLOROPROPANE	4.75		ug/L	5.00	ND	95	70-130			
1,4-DICHLOROBENZENE	5.47		ug/L	5.00	ND	109	70-130			
2,2-DICHLOROPROPANE	5.89		ug/L	5.00	ND	118	70-130			
2-CHLOROTOLUENE	5.02		ug/L	5.00	ND	100	70-130			
4-CHLOROTOLUENE	5.00		ug/L	5.00	ND	100	70-130			
4-ISOPROPYLTOLUENE	5.47		ug/L	5.00	ND	109	70-130			
BENZENE	5.24		ug/L	5.00	ND	105	70-130			
BROMOBENZENE	5.07		ug/L	5.00	ND	101	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BH63103-MS1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	5.41		ug/L	5.00	ND	108	70-130			
BROMODICHLOROMETHANE	4.97		ug/L	5.00	ND	99	70-130			
BROMOFORM	4.70		ug/L	5.00	ND	94	70-130			
BROMOMETHANE	4.64		ug/L	5.00	ND	93	70-130			
CARBON TETRACHLORIDE	5.35		ug/L	5.00	ND	107	70-130			
CHLOROBENZENE	5.19		ug/L	5.00	ND	104	70-130			
CHLOROETHANE	4.76		ug/L	5.00	ND	95	70-130			
CHLOROFORM	5.39		ug/L	5.00	ND	108	70-130			
CHLOROMETHANE	4.54		ug/L	5.00	ND	91	70-130			
CIS-1,2-DICHLOROETHENE	5.49		ug/L	5.00	ND	110	70-130			
CIS-1,3-DICHLOROPROPENE	4.86		ug/L	5.00	ND	97	70-130			
DIBROMOCHLOROMETHANE	4.88		ug/L	5.00	ND	98	70-130			
DIBROMOMETHANE	4.90		ug/L	5.00	ND	98	70-130			
DICHLORODIFLUOROMETHANE	6.47		ug/L	5.00	1.60	97	70-130			
DICHLOROMETHANE	5.18		ug/L	5.00	ND	104	70-130			
ETHYLBENZENE	4.86		ug/L	5.00	ND	97	70-130			
ETHYLENE DIBROMIDE	5.17		ug/L	5.00	ND	103	70-130			
HEXACHLOROBUTADIENE	5.37		ug/L	5.00	ND	107	70-130			
ISOPROPYLBENZENE	6.21		ug/L	5.00	ND	124	70-130			
M/P-XYLENES	10.4		ug/L	10.0	ND	104	70-130			
METHYL-TERT-BUTYL ETHER	5.13		ug/L	5.00	ND	103	70-130			
NAPHTHALENE	4.88		ug/L	5.00	ND	98	70-130			
N-BUTYLBENZENE	5.34		ug/L	5.00	ND	107	70-130			
N-PROPYLBENZENE	4.86		ug/L	5.00	ND	97	70-130			
ORTHO-XYLENE	5.02		ug/L	5.00	ND	100	70-130			
SEC-BUTYLBENZENE	5.24		ug/L	5.00	ND	105	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BH63103-MS1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	4.80		ug/L	5.00	ND	96	70-130			
TERT-BUTYLBENZENE	5.13		ug/L	5.00	ND	103	70-130			
TETRACHLOROETHENE	11.3		ug/L	5.00	5.00	126	70-130			
TOLUENE	5.12		ug/L	5.00	ND	102	70-130			
TRANS-1,2-DICHLOROETHENE	5.33		ug/L	5.00	ND	107	70-130			
TRANS-1,3-DICHLOROPROPENE	4.96		ug/L	5.00	ND	99	70-130			
TRICHLOROETHENE	7.15		ug/L	5.00	2.30	97	70-130			
TRICHLOROFLUOROMETHANE	6.76		ug/L	5.00	0.600	123	70-130			
VINYL CHLORIDE	4.82		ug/L	5.00	ND	96	70-130			
Surrogate: BROMOFLUOROBENZENE (SURR.)	*4.72*		ug/L	*5.00*		*94*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*5.09*		ug/L	*5.00*		*102*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.95*		ug/L	*5.00*		*99*	*70-130*			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63103-MSD1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	5.05		ug/L	5.00	ND	101	70-130	2	20	
1,1,1-TRICHLOROETHANE	5.43		ug/L	5.00	ND	109	70-130	1	20	
1,1,2,2-TETRACHLOROETHANE	4.73		ug/L	5.00	ND	95	70-130	0.6	20	
1,1,2-TRICHLOROETHANE	5.20		ug/L	5.00	ND	104	70-130	2	20	
1,1-DICHLOROETHANE	5.79		ug/L	5.00	0.280	110	70-130	0.2	20	
1,1-DICHLOROETHENE	5.73		ug/L	5.00	ND	115	70-130	8	20	
1,1-DICHLOROPROPENE	5.59		ug/L	5.00	ND	112	70-130	4	20	
1,2,3-TRICHLOROBENZENE	5.03		ug/L	5.00	ND	101	70-130	5	20	
1,2,3-TRICHLOROPROPANE	4.73		ug/L	5.00	ND	95	70-130	1	20	
1,2,4-TRICHLOROBENZENE	5.03		ug/L	5.00	ND	101	70-130	5	20	
1,2,4-TRIMETHYLBENZENE	5.01		ug/L	5.00	ND	100	70-130	3	20	
1,2-DIBROMO-3-CHLOROPROPANE	4.73		ug/L	5.00	ND	95	70-130	0.4	20	
1,2-DICHLOROBENZENE	5.11		ug/L	5.00	ND	102	70-130	4	20	
1,2-DICHLOROETHANE	5.06		ug/L	5.00	ND	101	70-130	2	20	
1,2-DICHLOROPROPANE	5.15		ug/L	5.00	ND	103	70-130	0.2	20	
1,3,5-TRIMETHYLBENZENE	4.96		ug/L	5.00	ND	99	70-130	3	20	
1,3-DICHLOROBENZENE	5.39		ug/L	5.00	ND	108	70-130	1	20	
1,3-DICHLOROPROPANE	4.97		ug/L	5.00	ND	99	70-130	5	20	
1,4-DICHLOROBENZENE	5.18		ug/L	5.00	ND	104	70-130	5	20	
2,2-DICHLOROPROPANE	5.59		ug/L	5.00	ND	112	70-130	5	20	
2-CHLOROTOLUENE	5.38		ug/L	5.00	ND	108	70-130	7	20	
4-CHLOROTOLUENE	5.10		ug/L	5.00	ND	102	70-130	2	20	
4-ISOPROPYLTOLUENE	5.25		ug/L	5.00	ND	105	70-130	4	20	
BENZENE	5.26		ug/L	5.00	ND	105	70-130	0.4	20	
BROMOBENZENE	5.20		ug/L	5.00	ND	104	70-130	3	20	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63103-MSD1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	5.36		ug/L	5.00	ND	107	70-130	0.9	20	
BROMODICHLOROMETHANE	5.15		ug/L	5.00	ND	103	70-130	4	20	
BROMOFORM	4.77		ug/L	5.00	ND	95	70-130	1	20	
BROMOMETHANE	4.73		ug/L	5.00	ND	95	70-130	2	20	
CARBON TETRACHLORIDE	5.45		ug/L	5.00	ND	109	70-130	2	20	
CHLOROBENZENE	5.17		ug/L	5.00	ND	103	70-130	0.4	20	
CHLOROETHANE	5.65		ug/L	5.00	ND	113	70-130	17	20	
CHLOROFORM	5.25		ug/L	5.00	ND	105	70-130	3	20	
CHLOROMETHANE	4.56		ug/L	5.00	ND	91	70-130	0.4	20	
CIS-1,2-DICHLOROETHENE	5.32		ug/L	5.00	ND	106	70-130	3	20	
CIS-1,3-DICHLOROPROPENE	4.89		ug/L	5.00	ND	98	70-130	0.6	20	
DIBROMOCHLOROMETHANE	5.17		ug/L	5.00	ND	103	70-130	6	20	
DIBROMOMETHANE	5.21		ug/L	5.00	ND	104	70-130	6	20	
DICHLORODIFLUOROMETHANE	6.62		ug/L	5.00	1.60	100	70-130	3	20	
DICHLOROMETHANE	5.09		ug/L	5.00	ND	102	70-130	2	20	
ETHYLBENZENE	4.99		ug/L	5.00	ND	100	70-130	3	20	
ETHYLENE DIBROMIDE	5.06		ug/L	5.00	ND	101	70-130	2	20	
HEXACHLOROBUTADIENE	5.30		ug/L	5.00	ND	106	70-130	1	20	
ISOPROPYLBENZENE	6.31		ug/L	5.00	ND	126	70-130	2	20	
M/P-XYLENES	10.4		ug/L	10.0	ND	104	70-130	0.4	20	
METHYL-TERT-BUTYL ETHER	5.11		ug/L	5.00	ND	102	70-130	0.4	20	
NAPHTHALENE	4.75		ug/L	5.00	ND	95	70-130	3	20	
N-BUTYLBENZENE	5.12		ug/L	5.00	ND	102	70-130	4	20	
N-PROPYLBENZENE	5.12		ug/L	5.00	ND	102	70-130	5	20	
ORTHO-XYLENE	5.00		ug/L	5.00	ND	100	70-130	0.4	20	
SEC-BUTYLBENZENE	5.41		ug/L	5.00	ND	108	70-130	3	20	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63103-MSD1)	**Source: L161087-01**		Prepared & Analyzed: 08/31/2016							
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	4.91		ug/L	5.00	ND	98	70-130	2	20	
TERT-BUTYLBENZENE	5.18		ug/L	5.00	ND	104	70-130	1	20	
TETRACHLOROETHENE	10.8		ug/L	5.00	5.00	117	70-130	8	20	
TOLUENE	5.23		ug/L	5.00	ND	105	70-130	2	20	
TRANS-1,2-DICHLOROETHENE	5.42		ug/L	5.00	ND	108	70-130	2	20	
TRANS-1,3-DICHLOROPROPENE	5.09		ug/L	5.00	ND	102	70-130	3	20	
TRICHLOROETHENE	7.73		ug/L	5.00	2.30	109	70-130	11	20	
TRICHLOROFLUOROMETHANE	6.45		ug/L	5.00	0.600	117	70-130	5	20	
VINYL CHLORIDE	4.73		ug/L	5.00	ND	95	70-130	2	20	
Surrogate: BROMOFLUOROBENZENE (SURR.)	*5.02*		ug/L	*5.00*		*100*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*5.17*		ug/L	*5.00*		*103*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.92*		ug/L	*5.00*		*98*	*70-130*			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Reference (BH63103-SRM1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	4.89		ug/L	5.00		98	70-130			
1,1,1-TRICHLOROETHANE	4.90		ug/L	5.00		98	70-130			
1,1,2,2-TETRACHLOROETHANE	4.75		ug/L	5.00		95	70-130			
1,1,2-TRICHLOROETHANE	4.86		ug/L	5.00		97	70-130			
1,1-DICHLOROETHANE	4.87		ug/L	5.00		97	70-130			
1,1-DICHLOROETHENE	4.82		ug/L	5.00		96	70-130			
1,1-DICHLOROPROPENE	4.77		ug/L	5.00		95	70-130			
1,2,3-TRICHLOROBENZENE	4.91		ug/L	5.00		98	70-130			
1,2,3-TRICHLOROPROPANE	4.75		ug/L	5.00		95	70-130			
1,2,4-TRICHLOROBENZENE	5.03		ug/L	5.00		101	70-130			
1,2,4-TRIMETHYLBENZENE	5.05		ug/L	5.00		101	70-130			
1,2-DIBROMO-3-CHLOROPROPANE	4.70		ug/L	5.00		94	70-130			
1,2-DICHLOROBENZENE	5.01		ug/L	5.00		100	70-130			
1,2-DICHLOROETHANE	4.87		ug/L	5.00		97	70-130			
1,2-DICHLOROPROPANE	4.64		ug/L	5.00		93	70-130			
1,3,5-TRIMETHYLBENZENE	4.87		ug/L	5.00		97	70-130			
1,3-DICHLOROBENZENE	5.20		ug/L	5.00		104	70-130			
1,3-DICHLOROPROPANE	4.79		ug/L	5.00		96	70-130			
1,4-DICHLOROBENZENE	4.96		ug/L	5.00		99	70-130			
2,2-DICHLOROPROPANE	5.52		ug/L	5.00		110	70-130			
2-CHLOROTOLUENE	5.03		ug/L	5.00		101	70-130			
4-CHLOROTOLUENE	4.93		ug/L	5.00		99	70-130			
4-ISOPROPYLTOLUENE	4.94		ug/L	5.00		99	70-130			
BENZENE	4.81		ug/L	5.00		96	70-130			
BROMOBENZENE	5.15		ug/L	5.00		103	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Reference (BH63103-SRM1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	5.07		ug/L	5.00		101	70-130			
BROMODICHLOROMETHANE	4.76		ug/L	5.00		95	70-130			
BROMOFORM	4.93		ug/L	5.00		99	70-130			
BROMOMETHANE	4.33		ug/L	5.00		87	70-130			
CARBON TETRACHLORIDE	4.94		ug/L	5.00		99	70-130			
CHLOROBENZENE	4.91		ug/L	5.00		98	70-130			
CHLOROETHANE	4.77		ug/L	5.00		95	70-130			
CHLOROFORM	4.79		ug/L	5.00		96	70-130			
CHLOROMETHANE	4.14		ug/L	5.00		83	70-130			
CIS-1,2-DICHLOROETHENE	4.93		ug/L	5.00		99	70-130			
CIS-1,3-DICHLOROPROPENE	4.65		ug/L	5.00		93	70-130			
DIBROMOCHLOROMETHANE	5.06		ug/L	5.00		101	70-130			
DIBROMOMETHANE	4.74		ug/L	5.00		95	70-130			
DICHLORODIFLUOROMETHANE	4.66		ug/L	5.00		93	70-130			
DICHLOROMETHANE	4.69		ug/L	5.00		94	70-130			
ETHYLBENZENE	4.79		ug/L	5.00		96	70-130			
ETHYLENE DIBROMIDE	5.13		ug/L	5.00		103	70-130			
HEXACHLOROBUTADIENE	5.05		ug/L	5.00		101	70-130			
ISOPROPYLBENZENE	5.87		ug/L	5.00		117	70-130			
M/P-XYLENES	9.86		ug/L	10.0		99	70-130			
METHYL-TERT-BUTYL ETHER	4.86		ug/L	5.00		97	70-130			
NAPHTHALENE	4.67		ug/L	5.00		93	70-130			
N-BUTYLBENZENE	5.00		ug/L	5.00		100	70-130			
N-PROPYLBENZENE	4.86		ug/L	5.00		97	70-130			
ORTHO-XYLENE	4.88		ug/L	5.00		98	70-130			
SEC-BUTYLBENZENE	5.07		ug/L	5.00		101	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Reference (BH63103-SRM1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	4.71		ug/L	5.00		94	70-130			
TERT-BUTYLBENZENE	4.96		ug/L	5.00		99	70-130			
TETRACHLOROETHENE	4.88		ug/L	5.00		98	70-130			
TOLUENE	4.86		ug/L	5.00		97	70-130			
TRANS-1,2-DICHLOROETHENE	4.87		ug/L	5.00		97	70-130			
TRANS-1,3-DICHLOROPROPENE	4.98		ug/L	5.00		100	70-130			
TRICHLOROETHENE	5.06		ug/L	5.00		101	70-130			
TRICHLOROFLUOROMETHANE	5.27		ug/L	5.00		105	70-130			
VINYL CHLORIDE	4.29		ug/L	5.00		86	70-130			
Surrogate: BROMOFLUOROBENZENE (SURR.)	*4.94*		ug/L	*5.00*		*99*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*4.69*		ug/L	*5.00*		*94*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.85*		ug/L	*5.00*		*97*	*70-130*			

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI60906-BLK1)				Prepared: 09/08/2016 Analyzed: 09/09/2016						
Batch BI60906 - EPA 200.7/200.8										
BARIUM	ND	0.0200	mg/L							
CALCIUM	ND	2.00	mg/L							
IRON	ND	0.0200	mg/L							
MAGNESIUM	ND	0.500	mg/L							
MANGANESE	ND	0.0200	mg/L							
POTASSIUM	ND	0.500	mg/L							
SODIUM	ND	2.00	mg/L							
LCS (BI60906-BS1)				Prepared: 09/08/2016 Analyzed: 09/09/2016						
Batch BI60906 - EPA 200.7/200.8										
BARIUM	0.201	0.0200	mg/L	0.200		100	85-115			
CALCIUM	20.7	2.00	mg/L	20.0		104	85-115			
IRON	1.02	0.0200	mg/L	1.00		102	85-115			
MAGNESIUM	5.17	0.500	mg/L	5.00		103	85-115			
MANGANESE	0.202	0.0200	mg/L	0.200		101	85-115			
POTASSIUM	2.11	0.500	mg/L	2.00		105	85-115			
SODIUM	21.5	2.00	mg/L	20.0		108	85-115			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BI60906-MS1)	**Source: L161077-03**			Prepared: 09/08/2016 Analyzed: 09/09/2016						
Batch BI60906 - EPA 200.7/200.8										
BARIUM	0.253	0.0200	mg/L	0.200	0.0517	101	70-130			
CALCIUM	60.6	2.00	mg/L	20.0	41.8	93.6	70-130			
IRON	1.04	0.0200	mg/L	1.00	0.0218	101	70-130			
MAGNESIUM	34.3	0.500	mg/L	5.00	29.6	92.8	70-130			
MANGANESE	0.201	0.0200	mg/L	0.200	0.00129	99.9	70-130			
POTASSIUM	4.33	0.500	mg/L	2.00	2.17	108	70-130			
Matrix Spike Dup (BI60906-MSD1)	**Source: L161077-03**			Prepared: 09/08/2016 Analyzed: 09/09/2016						
Batch BI60906 - EPA 200.7/200.8										
BARIUM	0.254	0.0200	mg/L	0.200	0.0517	101	70-130	0.311	10	
CALCIUM	60.2	2.00	mg/L	20.0	41.8	91.9	70-130	0.583	10	
IRON	1.04	0.0200	mg/L	1.00	0.0218	101	70-130	0.0148	10	
MAGNESIUM	34.1	0.500	mg/L	5.00	29.6	89.8	70-130	0.432	10	
MANGANESE	0.201	0.0200	mg/L	0.200	0.00129	100	70-130	0.0973	10	
POTASSIUM	4.25	0.500	mg/L	2.00	2.17	104	70-130	1.99	10	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI61603-BLK1)				Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	ND	0.0200	mg/L							
CALCIUM	ND	2.00	mg/L							
IRON	ND	0.0200	mg/L							
MAGNESIUM	ND	0.500	mg/L							
MANGANESE	ND	0.0200	mg/L							
POTASSIUM	ND	0.500	mg/L							
SODIUM	ND	2.00	mg/L							
LCS (BI61603-BS1)				Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	0.201	0.0200	mg/L	0.200		100	85-115			
CALCIUM	20.2	2.00	mg/L	20.0		101	85-115			
IRON	0.991	0.0200	mg/L	1.00		99.1	85-115			
MAGNESIUM	5.05	0.500	mg/L	5.00		101	85-115			
MANGANESE	0.200	0.0200	mg/L	0.200		100	85-115			
POTASSIUM	2.01	0.500	mg/L	2.00		100	85-115			
SODIUM	20.2	2.00	mg/L	20.0		101	85-115			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BI61603-MS1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	0.244	0.0200	mg/L	0.200	0.0395	102	70-130			
CALCIUM	27.8	2.00	mg/L	20.0	7.87	99.8	70-130			
IRON	1.50	0.0200	mg/L	1.00	0.502	99.7	70-130			
MAGNESIUM	9.33	0.500	mg/L	5.00	4.12	104	70-130			
MANGANESE	0.205	0.0200	mg/L	0.200	0.00290	101	70-130			
POTASSIUM	3.53	0.500	mg/L	2.00	1.39	107	70-130			
SODIUM	193	2.00	mg/L	20.0	169	119	70-130			
Matrix Spike Dup (BI61603-MSD1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	0.244	0.0200	mg/L	0.200	0.0395	102	70-130	0.174	10	
CALCIUM	28.0	2.00	mg/L	20.0	7.87	101	70-130	0.694	10	
IRON	1.50	0.0200	mg/L	1.00	0.502	99.8	70-130	0.0273	10	
MAGNESIUM	9.41	0.500	mg/L	5.00	4.12	106	70-130	0.852	10	
MANGANESE	0.205	0.0200	mg/L	0.200	0.00290	101	70-130	0.113	10	
POTASSIUM	3.50	0.500	mg/L	2.00	1.39	106	70-130	0.781	10	
SODIUM	197	2.00	mg/L	20.0	169	138	70-130	2.04	10	

Total Metals by ICPMS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Total Metals by ICPMS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI61501-BLK1)				Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	ND	0.00100	mg/L							
LEAD	ND	0.00100	mg/L							
LCS (BI61501-BS1)				Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	0.0113	0.00100	mg/L	0.0100		113	85-115			
LEAD	0.00984	0.00100	mg/L	0.0100		98.4	85-115			
Matrix Spike (BI61501-MS1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	0.0139	0.00100	mg/L	0.0100	0.00296	110	70-130			
LEAD	0.00960	0.00100	mg/L	0.0100	0.000361	92.4	70-130			
Matrix Spike Dup (BI61501-MSD1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	0.0140	0.00100	mg/L	0.0100	0.00296	110	70-130	0.151	10	
LEAD	0.00965	0.00100	mg/L	0.0100	0.000361	92.9	70-130	0.582	10	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Total Metals by ICPMS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI61502-BLK1)				Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61502 - EPA 200.7/200.8										
ARSENIC	ND	0.00100	mg/L							
LEAD	ND	0.00100	mg/L							
LCS (BI61502-BS1)				Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61502 - EPA 200.7/200.8										
ARSENIC	0.0111	0.00100	mg/L	0.0100		111	85-115			
LEAD	0.0101	0.00100	mg/L	0.0100		101	85-115			
Matrix Spike (BI61502-MS1)	**Source: L161077-03**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61502 - EPA 200.7/200.8										
LEAD	0.00939	0.00100	mg/L	0.0100	0.000276	91.1	70-130			
Matrix Spike (BI61502-MS2)	**Source: L161077-03RE1**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61502 - EPA 200.7/200.8										
ARSENIC	0.0167	0.00200	mg/L	0.0100	0.00635	104	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Total Metals by ICPMS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BI61502-MSD1)	**Source: L161077-03**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61502 - EPA 200.7/200.8										
LEAD	0.00949	0.00100	mg/L	0.0100	0.000276	92.2	70-130	1.12	10	
Matrix Spike Dup (BI61502-MSD2)	**Source: L161077-03RE1**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61502 - EPA 200.7/200.8										
ARSENIC	0.0167	0.00200	mg/L	0.0100	0.00635	104	70-130	0.0359	10	

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BH63105-DUP1)	**Source: L161080-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63105 - Default Prep - Wet Chemistry										
TOTAL DISSOLVED SOLIDS	510	10.0	mg/L		507			0.590	5	
Matrix Spike (BH63111-MS1)	**Source: L161092-01**			Prepared & Analyzed: 08/30/2016						
Batch BH63111 - Default Prep - Wet Chemistry										
BROMIDE	0.9	0.104	mg/L	0.833	0.02	105	80-120			
CHLORIDE	113	3.12	mg/L	41.7	70.2	103	80-120			
FLUORIDE	1.4	0.104	mg/L	0.833	0.5	100	80-120			
NITRATE AS N	5.4	0.260	mg/L	4.17	1.2	102	80-120			
NITRITE AS N	1.4	0.104	mg/L	1.56	ND	88.4	80-120			
ORTHO PHOSPHATE AS P	0.8	0.208	mg/L	0.833	ND	98.5	80-120			
SULFATE	212	5.21	mg/L	41.7	171	98.7	80-120			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63111-MSD1)	**Source: L161092-01**			Prepared & Analyzed: 08/30/2016						
Batch BH63111 - Default Prep - Wet Chemistry										
BROMIDE	0.9	0.104	mg/L	0.833	0.02	106	80-120	0.657	10	
CHLORIDE	113	3.12	mg/L	41.7	70.2	103	80-120	0.00806	10	
FLUORIDE	1.4	0.104	mg/L	0.833	0.5	100	80-120	0.0380	10	
NITRATE AS N	5.4	0.260	mg/L	4.17	1.2	103	80-120	0.155	10	
NITRITE AS N	1.4	0.104	mg/L	1.56	ND	88.1	80-120	0.310	10	
ORTHO PHOSPHATE AS P	0.8	0.208	mg/L	0.833	ND	98.9	80-120	0.393	10	
SULFATE	212	5.21	mg/L	41.7	171	98.7	80-120	0.00236	10	
Matrix Spike (BH63112-MS1)	**Source: L161077-04**			Prepared & Analyzed: 08/30/2016						
Batch BH63112 - Default Prep - Wet Chemistry										
BROMIDE	1.5	0.104	mg/L	0.833	0.7	99.5	80-120			
CHLORIDE	122	3.12	mg/L	41.7	80.0	101	80-120			
FLUORIDE	1.8	0.104	mg/L	0.833	1.0	103	80-120			
NITRATE AS N	5.2	0.260	mg/L	4.17	1.1	99.0	80-120			
NITRITE AS N	1.5	0.104	mg/L	1.56	ND	98.9	80-120			
ORTHO PHOSPHATE AS P	0.9	0.208	mg/L	0.833	ND	103	80-120			
SULFATE	187	5.21	mg/L	41.7	145	102	80-120			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63112-MSD1)	**Source: L161077-04**			Prepared & Analyzed: 08/30/2016						
Batch BH63112 - Default Prep - Wet Chemistry										
BROMIDE	1.5	0.104	mg/L	0.833	0.7	99.0	80-120	0.309	10	
CHLORIDE	122	3.12	mg/L	41.7	80.0	101	80-120	0.0621	10	
FLUORIDE	1.8	0.104	mg/L	0.833	1.0	104	80-120	0.0970	10	
NITRATE AS N	5.2	0.260	mg/L	4.17	1.1	99.2	80-120	0.192	10	
NITRITE AS N	1.5	0.104	mg/L	1.56	ND	98.9	80-120	0.0540	10	
ORTHO PHOSPHATE AS P	0.8	0.208	mg/L	0.833	ND	99.1	80-120	3.42	10	
SULFATE	187	5.21	mg/L	41.7	145	102	80-120	0.0132	10	
Blank (BI60201-BLK1)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
Blank (BI60201-BLK2)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
Blank (BI60201-BLK3)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI60201-BLK4)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
Blank (BI60201-BLK5)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
LCS (BI60201-BS1)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	4.67		mg/L	5.00		93	90-110			
LCS (BI60201-BS2)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	9.31		mg/L	10.0		93	90-110			
LCS (BI60201-BS3)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	4.75		mg/L	5.00		95	90-110			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BI60201-BS4)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	9.42		mg/L	10.0		94	90-110			
LCS (BI60201-BS5)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	4.66		mg/L	5.00		93	90-110			
MRL Check (BI60201-MRL1)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	0.254		mg/L	0.250		102	50-150			
Matrix Spike (BI60201-MS1)	**Source: L160949-02**			Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	1.30		mg/L	0.900	0.473	92	83-108			
Matrix Spike (BI60201-MS2)	**Source: L161078-04**			Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	1.11		mg/L	0.900	0.318	88	83-108			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BI60206-DUP1)	**Source: L161080-01**			Prepared & Analyzed: 09/02/2016						
Batch BI60206 - Default Prep - Wet Chemistry										
ALKALINITY, TOTAL	106	20.0	mg/L as CaCO3		108			1.22	10	
Matrix Spike (BI60206-MS1)	**Source: L161080-01**			Prepared & Analyzed: 09/02/2016						
Batch BI60206 - Default Prep - Wet Chemistry										
ALKALINITY, TOTAL	170	20.0	mg/L as CaCO3	59.0	108	106	80-120			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Certified Analyses included in this Report

Analyte	Certifications

Code	Description	Number	Expires

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:31

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Items for Project Manager Review

LabNumber	Analysis	Analyte	Exception
			Data included from: \ \\166.89.22.21\ElementServerFolders\TransferIn\L161077 TRANSFER 09 15 2016 1307.

TUCSON WATER CHAIN OF CUSTODY

LOGIN ID: L161077

CLIENT: ES

PROJECT NAME/FREQUENCY: Tumamoc Landfill ANNUAL

PROJECT #: P01025

SAMPLING DATE: 8/30/16

SAMPLED BY: print full name: Luis Clark

signature: [signature]

SAMPLE #	TIME	LOCATION	SITE	NUMBER OF CONTAINERS	Ba - Fe - Mn (HNO3) ICP	Ca - Mg - K - Na (HNO3) ICP	As - Pb (HNO3) ICPMS	CVAA	Anions - Alkalinity - TDS (Unpreserved)	TOC (H2SO4)	8260 (HCl)	Ammonia (H2SO4)	COMMENTS
-01	0730	WR-447A	WELL	10	X	X	X		X	X	X	X	TB-08
-02	0800	WR-446A	WELL	10	X	X	X		X	X	X	X	TB-08
-03	0835	WR-454B	WELL	10	X	X	X		X	X	X	X	TB-08
-04	0900	WR-455A	WELL	10	X	X	X		X	X	X	X	TB-08
-05	0925	WR-455B	WELL	10	X	X	X		X	X	X	X	TB-08
-06	1000	WR-454A	WELL	10	X	X	X		X	X	X	X	TB-08
-07	1005	WR-454A	WELL	10	X	X	X		X	X	X	X	TB-08
-08	0736	Trip Blank	TWQL	2							X		Lot# 060116

Preservative columns: (Na2S2O3), (Unpreserved), (HNO3), (H2SO4), (NaS2O3/H2SO4), (Unpreserved), (NaS2O3/H2SO4), (H2SO4), (HCl), (NP), (Na2S2O3) EEA, (Unpreserved) EEA, (H2SO4) EEA, HCl EEA, (NaOH/Zinc Acetate) EEA

COMMENTS: Use designated bottles for high-alkalinity wells - see reverse

SPECIAL TURNAROUND TIME:

	SIGNATURE	DATE/TIME		SIGNATURE	DATE/TIME
RELINQUISHED BY:	[signature]	8/30/16, 1325	RECEIVED BY:	[signature]	08/30/16 1303
RELINQUISHED BY:	[signature]	09/01/16 1500	RECEIVED BY:	UPS / 1Z4R80260199223944	09/01/16 1615
RELINQUISHED BY:			RECEIVED BY:		

RECEIVING TEMPERATURE= 3.0°C

4401 S. Tucson Estates Parkway
Tucson, Arizona 85735
520.791.2544 Phone
520.791.5260 Fax

26 September 2016

Arturo Burgos

Environmental Services

-

Tucson, AZ 85735

RE: Tumamoc Landfill

Enclosed are the results for Work Order L161078, received by the laboratory on 08/31/2016 11:59. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michael E. Dew
Lab Manager

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WR-449A	L161078-01	Aqueous	08/31/2016 07:45	08/31/2016 11:59
WR-384A	L161078-02	Aqueous	08/31/2016 08:05	08/31/2016 11:59
WR-445A	L161078-03	Aqueous	08/31/2016 08:40	08/31/2016 11:59
WR-385A	L161078-04	Aqueous	08/31/2016 09:30	08/31/2016 11:59
WR-385B	L161078-05	Aqueous	08/31/2016 09:50	08/31/2016 11:59
TRIP BLANK	L161078-07	Aqueous	08/31/2016 07:45	08/31/2016 11:59

All QC results were within QC llimits with the following exceptions:

The ammonia nitrogen results for L161078-01 (WR-449A), L161078-02 (WR-384A) and L161078-03 (WR-445A) required the "N1" data qualifier. The matrix spike recovery associated with these samples failed with a recovery of 66%, which is outside the recovery limits of 90% - 110%. The spiked sample was not from this samples set.

Please see page 53 for Notes and Definitions.

Tucson Water Quality Laboratory

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Michael E. Dew, Lab Manager

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-449A

L161078-01 (Aqueous)

Sampled: 08/31/2016 7:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	N1
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-449A

L161078-01 (Aqueous)

Sampled: 08/31/2016 7:45

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	**0.0015**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	**0.0011**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-449A

L161078-01 (Aqueous)

Sampled: 08/31/2016 7:45

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	**0.0038**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*95 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*110 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*99 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-449A

L161078-01 (Aqueous)

Sampled: 08/31/2016 7:45

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0299**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**21.0**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**13.7**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**10.5**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**250**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**250**	20.0	mg/L as CaCO3	1	BI60206	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**2.70**	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
FLUORIDE	**1.39**	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
SULFATE	**113**	5.00	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**997**	10.0	mg/L	1	BH63105	08/31/2016	08/31/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.94**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-449A

L161078-01RE1 (Aqueous)

Sampled: 08/31/2016 7:45

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
SODIUM	**313**	20.0	mg/L	10	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.0249**	0.00200	mg/L	2	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
CHLORIDE	**308**	30.0	mg/L	10	BI60110	08/31/2016	08/31/2016	EPA 300.0	
NITRATE AS N	**30.3**	2.50	mg/L	10	BI60110	08/31/2016	08/31/2016	EPA 300.0	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-384A

L161078-02 (Aqueous)

Sampled: 08/31/2016 8:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	N1
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-384A

L161078-02 (Aqueous)

Sampled: 08/31/2016 8:05

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-384A

L161078-02 (Aqueous)

Sampled: 08/31/2016 8:05

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	**0.0048**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	**0.0089**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*92 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*94 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*103 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-384A

L161078-02 (Aqueous)

Sampled: 08/31/2016 8:05

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.138**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**71.9**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	**5.57**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**42.8**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**5.99**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
LEAD	ND	0.00200	mg/L	2	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**532**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**532**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
FLUORIDE	**1.30**	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
NITRATE AS N	ND	0.250	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	**0.452**	0.200	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**3950**	10.0	mg/L	1	BI60208	09/02/2016	09/02/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.82**	0.25	mg/L	1	BI60201	09/02/2016	09/02/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-384A

L161078-02RE1 (Aqueous)

Sampled: 08/31/2016 8:05

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
MANGANESE	**2.74**	0.200	mg/L	10	BI61603	09/08/2016	09/16/2016	EPA 200.7	
SODIUM	**1360**	20.0	mg/L	10	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.0309**	0.0100	mg/L	10	BI61503	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
BROMIDE	**9.80**	2.50	mg/L	25	BI60110	08/31/2016	08/31/2016	EPA 300.0	
CHLORIDE	**1510**	75.0	mg/L	25	BI60110	08/31/2016	08/31/2016	EPA 300.0	
SULFATE	**637**	125	mg/L	25	BI60110	08/31/2016	08/31/2016	EPA 300.0	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-445A

L161078-03 (Aqueous)

Sampled: 08/31/2016 8:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	N1
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-445A

L161078-03 (Aqueous)

Sampled: 08/31/2016 8:40

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	**0.0005**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-445A

L161078-03 (Aqueous)

Sampled: 08/31/2016 8:40

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	**0.0034**	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*94 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*103 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*102 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-445A

L161078-03 (Aqueous)

Sampled: 08/31/2016 8:40

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0894**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**43.4**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**26.9**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
SODIUM	**124**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.0166**	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**225**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**225**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**1.01**	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
CHLORIDE	**111**	3.00	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
FLUORIDE	**1.07**	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
SULFATE	**92.7**	5.00	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**680**	10.0	mg/L	1	BI60208	09/02/2016	09/02/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.61**	0.25	mg/L	1	BI60201	09/03/2016	09/03/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-445A

L161078-03RE1 (Aqueous)

Sampled: 08/31/2016 8:40

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
POTASSIUM	**45.1**	5.00	mg/L	10	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Wet Chemistry									
NITRATE AS N	**15.3**	1.25	mg/L	5	BI60110	08/31/2016	08/31/2016	EPA 300.0	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385A

L161078-04 (Aqueous)

Sampled: 08/31/2016 9:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385A

L161078-04 (Aqueous)

Sampled: 08/31/2016 9:30

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385A

L161078-04 (Aqueous)

Sampled: 08/31/2016 9:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*95 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*101 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*101 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385A

L161078-04 (Aqueous)

Sampled: 08/31/2016 9:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0231**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**33.5**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**6.17**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**3.70**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**102**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**102**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**4.50**	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
FLUORIDE	**0.831**	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
NITRATE AS N	**1.59**	0.250	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BI60110	08/31/2016	08/31/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**1820**	10.0	mg/L	1	BI60208	09/02/2016	09/02/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.32**	0.25	mg/L	1	BI60201	09/03/2016	09/03/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385A

L161078-04RE1 (Aqueous)

Sampled: 08/31/2016 9:30

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
SODIUM	**617**	20.0	mg/L	10	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.00979**	0.00500	mg/L	5	BI61503	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
CHLORIDE	**542**	30.0	mg/L	10	BI60110	08/31/2016	08/31/2016	EPA 300.0	
SULFATE	**513**	50.0	mg/L	10	BI60110	08/31/2016	08/31/2016	EPA 300.0	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385B

L161078-05 (Aqueous)

Sampled: 08/31/2016 9:50

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Eurofins Eaton Analytical (AZ0778)									
Subcontracted Analyses: Wet Chemistry									
AMMONIA AS N	ND	0.05	mg/L	1	'[none]'		09/06/2016	EPA 350.1	
Tucson Water Quality Laboratory									
Volatile Organic Compounds by GC/MS									
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385B

L161078-05 (Aqueous)

Sampled: 08/31/2016 9:50

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385B

L161078-05 (Aqueous)

Sampled: 08/31/2016 9:50

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*91 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*99 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*100 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Total Metals by ICP									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385B

L161078-05 (Aqueous)

Sampled: 08/31/2016 9:50

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
BARIUM	**0.0371**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
CALCIUM	**8.48**	2.00	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
IRON	**0.128**	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MAGNESIUM	**5.02**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
MANGANESE	ND	0.0200	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
POTASSIUM	**1.94**	0.500	mg/L	1	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
LEAD	ND	0.00100	mg/L	1	BI61501	09/08/2016	09/13/2016	EPA 200.8	
Wet Chemistry									
ALKALINITY, BICARBONATE	**795**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
ALKALINITY, TOTAL	**795**	20.0	mg/L as CaCO3	1	BI60207	09/02/2016	09/02/2016	SM 2320B	
BROMIDE	**0.275**	0.100	mg/L	1	BI60111	09/01/2016	09/01/2016	EPA 300.0	
CHLORIDE	**29.6**	3.00	mg/L	1	BI60111	09/01/2016	09/01/2016	EPA 300.0	
FLUORIDE	**2.17**	0.100	mg/L	1	BI60111	09/01/2016	09/01/2016	EPA 300.0	
NITRATE AS N	**1.52**	0.250	mg/L	1	BI60111	09/01/2016	09/01/2016	EPA 300.0	
NITRITE AS N	ND	0.100	mg/L	1	BI60111	09/01/2016	09/01/2016	EPA 300.0	
ORTHO PHOSPHATE AS P	ND	0.200	mg/L	1	BI60111	09/01/2016	09/01/2016	EPA 300.0	
SULFATE	**238**	5.00	mg/L	1	BI60111	09/01/2016	09/01/2016	EPA 300.0	
TOTAL DISSOLVED SOLIDS	**1250**	10.0	mg/L	1	BI60208	09/02/2016	09/02/2016	SM 2540C	
TOTAL ORGANIC CARBON	**0.54**	0.25	mg/L	1	BI60201	09/03/2016	09/03/2016	SM 5310	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

WR-385B

L161078-05RE1 (Aqueous)

Sampled: 08/31/2016 9:50

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Metals by ICP									
SODIUM	**476**	20.0	mg/L	10	BI61603	09/08/2016	09/16/2016	EPA 200.7	
Total Metals by ICPMS									
ARSENIC	**0.0170**	0.00500	mg/L	5	BI61503	09/08/2016	09/13/2016	EPA 200.8	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

TRIP BLANK

L161078-07 (Aqueous)

Sampled: 08/31/2016 7:45

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,1-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,3-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
1,4-DICHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2,2-DICHLOROPROPANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
2-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-CHLOROTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

TRIP BLANK

L161078-07 (Aqueous)

Sampled: 08/31/2016 7:45

Tucson Water Quality Laboratory

Volatile Organic Compounds by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMODICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
BROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CARBON TETRACHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROFORM	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DIBROMOMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
DICHLOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ETHYLENE DIBROMIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
HEXACHLOROBUTADIENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ISOPROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
M/P-XYLENES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

TRIP BLANK

L161078-07 (Aqueous)

Sampled: 08/31/2016 7:45

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by GC/MS									
NAPHTHALENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
N-PROPYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
ORTHO-XYLENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
SEC-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
STYRENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TERT-BUTYLBENZENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TETRACHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOLUENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROETHENE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
VINYL CHLORIDE	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
XYLENES (TOTAL)	ND	0.0005	mg/L	1	BH63103	08/31/2016	08/31/2016	EPA 8260B	
Surrogate: BROMOFLUOROBENZENE (SURR.)		*89 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: DIBROMOFLUOROMETHANE (SURR.)		*103 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	
Surrogate: TOLUENE-D8 (SURR.)		*102 %*		*70-130*	*BH63103*	*08/31/2016*	*08/31/2016*	*EPA 8260B*	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BH63103-BLK1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	ND	0.0005	mg/L							
1,1,1-TRICHLOROETHANE	ND	0.0005	mg/L							
1,1,2,2-TETRACHLOROETHANE	ND	0.0005	mg/L							
1,1,2-TRICHLOROETHANE	ND	0.0005	mg/L							
1,1-DICHLOROETHANE	ND	0.0005	mg/L							
1,1-DICHLOROETHENE	ND	0.0005	mg/L							
1,1-DICHLOROPROPENE	ND	0.0005	mg/L							
1,2,3-TRICHLOROBENZENE	ND	0.0005	mg/L							
1,2,3-TRICHLOROPROPANE	ND	0.0005	mg/L							
1,2,4-TRICHLOROBENZENE	ND	0.0005	mg/L							
1,2,4-TRIMETHYLBENZENE	ND	0.0005	mg/L							
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.0005	mg/L							
1,2-DICHLOROBENZENE	ND	0.0005	mg/L							
1,2-DICHLOROETHANE	ND	0.0005	mg/L							
1,2-DICHLOROPROPANE	ND	0.0005	mg/L							
1,3,5-TRIMETHYLBENZENE	ND	0.0005	mg/L							
1,3-DICHLOROBENZENE	ND	0.0005	mg/L							
1,3-DICHLOROPROPANE	ND	0.0005	mg/L							
1,4-DICHLOROBENZENE	ND	0.0005	mg/L							
2,2-DICHLOROPROPANE	ND	0.0005	mg/L							
2-CHLOROTOLUENE	ND	0.0005	mg/L							
4-CHLOROTOLUENE	ND	0.0005	mg/L							
4-ISOPROPYLTOLUENE	ND	0.0005	mg/L							
BENZENE	ND	0.0005	mg/L							
BROMOBENZENE	ND	0.0005	mg/L							

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BH63103-BLK1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	ND	0.0005	mg/L							
BROMODICHLOROMETHANE	ND	0.0005	mg/L							
BROMOFORM	ND	0.0005	mg/L							
BROMOMETHANE	ND	0.0005	mg/L							
CARBON TETRACHLORIDE	ND	0.0005	mg/L							
CHLOROBENZENE	ND	0.0005	mg/L							
CHLOROETHANE	ND	0.0005	mg/L							
CHLOROFORM	ND	0.0005	mg/L							
CHLOROMETHANE	ND	0.0005	mg/L							
CIS-1,2-DICHLOROETHENE	ND	0.0005	mg/L							
CIS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L							
DIBROMOCHLOROMETHANE	ND	0.0005	mg/L							
DIBROMOMETHANE	ND	0.0005	mg/L							
DICHLORODIFLUOROMETHANE	ND	0.0005	mg/L							
DICHLOROMETHANE	ND	0.0005	mg/L							
ETHYLBENZENE	ND	0.0005	mg/L							
ETHYLENE DIBROMIDE	ND	0.0005	mg/L							
HEXACHLOROBUTADIENE	ND	0.0005	mg/L							
ISOPROPYLBENZENE	ND	0.0005	mg/L							
M/P-XYLENES	ND	0.0005	mg/L							
METHYL-TERT-BUTYL ETHER	ND	0.0005	mg/L							
NAPHTHALENE	ND	0.0005	mg/L							
N-BUTYLBENZENE	ND	0.0005	mg/L							
N-PROPYLBENZENE	ND	0.0005	mg/L							
ORTHO-XYLENE	ND	0.0005	mg/L							
SEC-BUTYLBENZENE	ND	0.0005	mg/L							

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BH63103-BLK1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	ND	0.0005	mg/L							
TERT-BUTYLBENZENE	ND	0.0005	mg/L							
TETRACHLOROETHENE	ND	0.0005	mg/L							
TOLUENE	ND	0.0005	mg/L							
TOTAL TRIHALOMETHANES	ND	0.0005	mg/L							
TRANS-1,2-DICHLOROETHENE	ND	0.0005	mg/L							
TRANS-1,3-DICHLOROPROPENE	ND	0.0005	mg/L							
TRICHLOROETHENE	ND	0.0005	mg/L							
TRICHLOROFLUOROMETHANE	ND	0.0005	mg/L							
VINYL CHLORIDE	ND	0.0005	mg/L							
XYLENES (TOTAL)	ND	0.0005	mg/L							
Surrogate: BROMOFLUOROBENZENE (SURR.)	*4.79*		ug/L	*5.00*		*96*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*4.99*		ug/L	*5.00*		*100*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.94*		ug/L	*5.00*		*99*	*70-130*			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BH63103-MS1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	4.93		ug/L	5.00	ND	99	70-130			
1,1,1-TRICHLOROETHANE	5.37		ug/L	5.00	ND	107	70-130			
1,1,2,2-TETRACHLOROETHANE	4.70		ug/L	5.00	ND	94	70-130			
1,1,2-TRICHLOROETHANE	5.10		ug/L	5.00	ND	102	70-130			
1,1-DICHLOROETHANE	5.78		ug/L	5.00	0.280	110	70-130			
1,1-DICHLOROETHENE	5.28		ug/L	5.00	ND	106	70-130			
1,1-DICHLOROPROPENE	5.37		ug/L	5.00	ND	107	70-130			
1,2,3-TRICHLOROBENZENE	5.28		ug/L	5.00	ND	106	70-130			
1,2,3-TRICHLOROPROPANE	4.68		ug/L	5.00	ND	94	70-130			
1,2,4-TRICHLOROBENZENE	5.27		ug/L	5.00	ND	105	70-130			
1,2,4-TRIMETHYLBENZENE	5.14		ug/L	5.00	ND	103	70-130			
1,2-DIBROMO-3-CHLOROPROPANE	4.71		ug/L	5.00	ND	94	70-130			
1,2-DICHLOROBENZENE	5.34		ug/L	5.00	ND	107	70-130			
1,2-DICHLOROETHANE	5.15		ug/L	5.00	ND	103	70-130			
1,2-DICHLOROPROPANE	5.14		ug/L	5.00	ND	103	70-130			
1,3,5-TRIMETHYLBENZENE	5.11		ug/L	5.00	ND	102	70-130			
1,3-DICHLOROBENZENE	5.32		ug/L	5.00	ND	106	70-130			
1,3-DICHLOROPROPANE	4.75		ug/L	5.00	ND	95	70-130			
1,4-DICHLOROBENZENE	5.47		ug/L	5.00	ND	109	70-130			
2,2-DICHLOROPROPANE	5.89		ug/L	5.00	ND	118	70-130			
2-CHLOROTOLUENE	5.02		ug/L	5.00	ND	100	70-130			
4-CHLOROTOLUENE	5.00		ug/L	5.00	ND	100	70-130			
4-ISOPROPYLTOLUENE	5.47		ug/L	5.00	ND	109	70-130			
BENZENE	5.24		ug/L	5.00	ND	105	70-130			
BROMOBENZENE	5.07		ug/L	5.00	ND	101	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BH63103-MS1)	**Source: L161087-01**		Prepared & Analyzed: 08/31/2016							
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	5.41		ug/L	5.00	ND	108	70-130			
BROMODICHLOROMETHANE	4.97		ug/L	5.00	ND	99	70-130			
BROMOFORM	4.70		ug/L	5.00	ND	94	70-130			
BROMOMETHANE	4.64		ug/L	5.00	ND	93	70-130			
CARBON TETRACHLORIDE	5.35		ug/L	5.00	ND	107	70-130			
CHLOROBENZENE	5.19		ug/L	5.00	ND	104	70-130			
CHLOROETHANE	4.76		ug/L	5.00	ND	95	70-130			
CHLOROFORM	5.39		ug/L	5.00	ND	108	70-130			
CHLOROMETHANE	4.54		ug/L	5.00	ND	91	70-130			
CIS-1,2-DICHLOROETHENE	5.49		ug/L	5.00	ND	110	70-130			
CIS-1,3-DICHLOROPROPENE	4.86		ug/L	5.00	ND	97	70-130			
DIBROMOCHLOROMETHANE	4.88		ug/L	5.00	ND	98	70-130			
DIBROMOMETHANE	4.90		ug/L	5.00	ND	98	70-130			
DICHLORODIFLUOROMETHANE	6.47		ug/L	5.00	1.60	97	70-130			
DICHLOROMETHANE	5.18		ug/L	5.00	ND	104	70-130			
ETHYLBENZENE	4.86		ug/L	5.00	ND	97	70-130			
ETHYLENE DIBROMIDE	5.17		ug/L	5.00	ND	103	70-130			
HEXACHLOROBUTADIENE	5.37		ug/L	5.00	ND	107	70-130			
ISOPROPYLBENZENE	6.21		ug/L	5.00	ND	124	70-130			
M/P-XYLENES	10.4		ug/L	10.0	ND	104	70-130			
METHYL-TERT-BUTYL ETHER	5.13		ug/L	5.00	ND	103	70-130			
NAPHTHALENE	4.88		ug/L	5.00	ND	98	70-130			
N-BUTYLBENZENE	5.34		ug/L	5.00	ND	107	70-130			
N-PROPYLBENZENE	4.86		ug/L	5.00	ND	97	70-130			
ORTHO-XYLENE	5.02		ug/L	5.00	ND	100	70-130			
SEC-BUTYLBENZENE	5.24		ug/L	5.00	ND	105	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BH63103-MS1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	4.80		ug/L	5.00	ND	96	70-130			
TERT-BUTYLBENZENE	5.13		ug/L	5.00	ND	103	70-130			
TETRACHLOROETHENE	11.3		ug/L	5.00	5.00	126	70-130			
TOLUENE	5.12		ug/L	5.00	ND	102	70-130			
TRANS-1,2-DICHLOROETHENE	5.33		ug/L	5.00	ND	107	70-130			
TRANS-1,3-DICHLOROPROPENE	4.96		ug/L	5.00	ND	99	70-130			
TRICHLOROETHENE	7.15		ug/L	5.00	2.30	97	70-130			
TRICHLOROFLUOROMETHANE	6.76		ug/L	5.00	0.600	123	70-130			
VINYL CHLORIDE	4.82		ug/L	5.00	ND	96	70-130			
Surrogate: BROMOFLUOROBENZENE (SURR.)	*4.72*		ug/L	*5.00*		*94*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*5.09*		ug/L	*5.00*		*102*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.95*		ug/L	*5.00*		*99*	*70-130*			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63103-MSD1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	5.05		ug/L	5.00	ND	101	70-130	2	20	
1,1,1-TRICHLOROETHANE	5.43		ug/L	5.00	ND	109	70-130	1	20	
1,1,2,2-TETRACHLOROETHANE	4.73		ug/L	5.00	ND	95	70-130	0.6	20	
1,1,2-TRICHLOROETHANE	5.20		ug/L	5.00	ND	104	70-130	2	20	
1,1-DICHLOROETHANE	5.79		ug/L	5.00	0.280	110	70-130	0.2	20	
1,1-DICHLOROETHENE	5.73		ug/L	5.00	ND	115	70-130	8	20	
1,1-DICHLOROPROPENE	5.59		ug/L	5.00	ND	112	70-130	4	20	
1,2,3-TRICHLOROBENZENE	5.03		ug/L	5.00	ND	101	70-130	5	20	
1,2,3-TRICHLOROPROPANE	4.73		ug/L	5.00	ND	95	70-130	1	20	
1,2,4-TRICHLOROBENZENE	5.03		ug/L	5.00	ND	101	70-130	5	20	
1,2,4-TRIMETHYLBENZENE	5.01		ug/L	5.00	ND	100	70-130	3	20	
1,2-DIBROMO-3-CHLOROPROPANE	4.73		ug/L	5.00	ND	95	70-130	0.4	20	
1,2-DICHLOROBENZENE	5.11		ug/L	5.00	ND	102	70-130	4	20	
1,2-DICHLOROETHANE	5.06		ug/L	5.00	ND	101	70-130	2	20	
1,2-DICHLOROPROPANE	5.15		ug/L	5.00	ND	103	70-130	0.2	20	
1,3,5-TRIMETHYLBENZENE	4.96		ug/L	5.00	ND	99	70-130	3	20	
1,3-DICHLOROBENZENE	5.39		ug/L	5.00	ND	108	70-130	1	20	
1,3-DICHLOROPROPANE	4.97		ug/L	5.00	ND	99	70-130	5	20	
1,4-DICHLOROBENZENE	5.18		ug/L	5.00	ND	104	70-130	5	20	
2,2-DICHLOROPROPANE	5.59		ug/L	5.00	ND	112	70-130	5	20	
2-CHLOROTOLUENE	5.38		ug/L	5.00	ND	108	70-130	7	20	
4-CHLOROTOLUENE	5.10		ug/L	5.00	ND	102	70-130	2	20	
4-ISOPROPYLTOLUENE	5.25		ug/L	5.00	ND	105	70-130	4	20	
BENZENE	5.26		ug/L	5.00	ND	105	70-130	0.4	20	
BROMOBENZENE	5.20		ug/L	5.00	ND	104	70-130	3	20	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63103-MSD1)	**Source: L161087-01**		Prepared & Analyzed: 08/31/2016							
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	5.36		ug/L	5.00	ND	107	70-130	0.9	20	
BROMODICHLOROMETHANE	5.15		ug/L	5.00	ND	103	70-130	4	20	
BROMOFORM	4.77		ug/L	5.00	ND	95	70-130	1	20	
BROMOMETHANE	4.73		ug/L	5.00	ND	95	70-130	2	20	
CARBON TETRACHLORIDE	5.45		ug/L	5.00	ND	109	70-130	2	20	
CHLOROBENZENE	5.17		ug/L	5.00	ND	103	70-130	0.4	20	
CHLOROETHANE	5.65		ug/L	5.00	ND	113	70-130	17	20	
CHLOROFORM	5.25		ug/L	5.00	ND	105	70-130	3	20	
CHLOROMETHANE	4.56		ug/L	5.00	ND	91	70-130	0.4	20	
CIS-1,2-DICHLOROETHENE	5.32		ug/L	5.00	ND	106	70-130	3	20	
CIS-1,3-DICHLOROPROPENE	4.89		ug/L	5.00	ND	98	70-130	0.6	20	
DIBROMOCHLOROMETHANE	5.17		ug/L	5.00	ND	103	70-130	6	20	
DIBROMOMETHANE	5.21		ug/L	5.00	ND	104	70-130	6	20	
DICHLORODIFLUOROMETHANE	6.62		ug/L	5.00	1.60	100	70-130	3	20	
DICHLOROMETHANE	5.09		ug/L	5.00	ND	102	70-130	2	20	
ETHYLBENZENE	4.99		ug/L	5.00	ND	100	70-130	3	20	
ETHYLENE DIBROMIDE	5.06		ug/L	5.00	ND	101	70-130	2	20	
HEXACHLOROBUTADIENE	5.30		ug/L	5.00	ND	106	70-130	1	20	
ISOPROPYLBENZENE	6.31		ug/L	5.00	ND	126	70-130	2	20	
M/P-XYLENES	10.4		ug/L	10.0	ND	104	70-130	0.4	20	
METHYL-TERT-BUTYL ETHER	5.11		ug/L	5.00	ND	102	70-130	0.4	20	
NAPHTHALENE	4.75		ug/L	5.00	ND	95	70-130	3	20	
N-BUTYLBENZENE	5.12		ug/L	5.00	ND	102	70-130	4	20	
N-PROPYLBENZENE	5.12		ug/L	5.00	ND	102	70-130	5	20	
ORTHO-XYLENE	5.00		ug/L	5.00	ND	100	70-130	0.4	20	
SEC-BUTYLBENZENE	5.41		ug/L	5.00	ND	108	70-130	3	20	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BH63103-MSD1)	**Source: L161087-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	4.91		ug/L	5.00	ND	98	70-130	2	20	
TERT-BUTYLBENZENE	5.18		ug/L	5.00	ND	104	70-130	1	20	
TETRACHLOROETHENE	10.8		ug/L	5.00	5.00	117	70-130	8	20	
TOLUENE	5.23		ug/L	5.00	ND	105	70-130	2	20	
TRANS-1,2-DICHLOROETHENE	5.42		ug/L	5.00	ND	108	70-130	2	20	
TRANS-1,3-DICHLOROPROPENE	5.09		ug/L	5.00	ND	102	70-130	3	20	
TRICHLOROETHENE	7.73		ug/L	5.00	2.30	109	70-130	11	20	
TRICHLOROFLUOROMETHANE	6.45		ug/L	5.00	0.600	117	70-130	5	20	
VINYL CHLORIDE	4.73		ug/L	5.00	ND	95	70-130	2	20	
Surrogate: BROMOFLUOROBENZENE (SURR.)	*5.02*		ug/L	*5.00*		*100*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*5.17*		ug/L	*5.00*		*103*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.92*		ug/L	*5.00*		*98*	*70-130*			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Reference (BH63103-SRM1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
1,1,1,2-TETRACHLOROETHANE	4.89		ug/L	5.00		98	70-130			
1,1,1-TRICHLOROETHANE	4.90		ug/L	5.00		98	70-130			
1,1,2,2-TETRACHLOROETHANE	4.75		ug/L	5.00		95	70-130			
1,1,2-TRICHLOROETHANE	4.86		ug/L	5.00		97	70-130			
1,1-DICHLOROETHANE	4.87		ug/L	5.00		97	70-130			
1,1-DICHLOROETHENE	4.82		ug/L	5.00		96	70-130			
1,1-DICHLOROPROPENE	4.77		ug/L	5.00		95	70-130			
1,2,3-TRICHLOROBENZENE	4.91		ug/L	5.00		98	70-130			
1,2,3-TRICHLOROPROPANE	4.75		ug/L	5.00		95	70-130			
1,2,4-TRICHLOROBENZENE	5.03		ug/L	5.00		101	70-130			
1,2,4-TRIMETHYLBENZENE	5.05		ug/L	5.00		101	70-130			
1,2-DIBROMO-3-CHLOROPROPANE	4.70		ug/L	5.00		94	70-130			
1,2-DICHLOROBENZENE	5.01		ug/L	5.00		100	70-130			
1,2-DICHLOROETHANE	4.87		ug/L	5.00		97	70-130			
1,2-DICHLOROPROPANE	4.64		ug/L	5.00		93	70-130			
1,3,5-TRIMETHYLBENZENE	4.87		ug/L	5.00		97	70-130			
1,3-DICHLOROBENZENE	5.20		ug/L	5.00		104	70-130			
1,3-DICHLOROPROPANE	4.79		ug/L	5.00		96	70-130			
1,4-DICHLOROBENZENE	4.96		ug/L	5.00		99	70-130			
2,2-DICHLOROPROPANE	5.52		ug/L	5.00		110	70-130			
2-CHLOROTOLUENE	5.03		ug/L	5.00		101	70-130			
4-CHLOROTOLUENE	4.93		ug/L	5.00		99	70-130			
4-ISOPROPYLTOLUENE	4.94		ug/L	5.00		99	70-130			
BENZENE	4.81		ug/L	5.00		96	70-130			
BROMOBENZENE	5.15		ug/L	5.00		103	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Reference (BH63103-SRM1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
BROMOCHLOROMETHANE	5.07		ug/L	5.00		101	70-130			
BROMODICHLOROMETHANE	4.76		ug/L	5.00		95	70-130			
BROMOFORM	4.93		ug/L	5.00		99	70-130			
BROMOMETHANE	4.33		ug/L	5.00		87	70-130			
CARBON TETRACHLORIDE	4.94		ug/L	5.00		99	70-130			
CHLOROBENZENE	4.91		ug/L	5.00		98	70-130			
CHLOROETHANE	4.77		ug/L	5.00		95	70-130			
CHLOROFORM	4.79		ug/L	5.00		96	70-130			
CHLOROMETHANE	4.14		ug/L	5.00		83	70-130			
CIS-1,2-DICHLOROETHENE	4.93		ug/L	5.00		99	70-130			
CIS-1,3-DICHLOROPROPENE	4.65		ug/L	5.00		93	70-130			
DIBROMOCHLOROMETHANE	5.06		ug/L	5.00		101	70-130			
DIBROMOMETHANE	4.74		ug/L	5.00		95	70-130			
DICHLORODIFLUOROMETHANE	4.66		ug/L	5.00		93	70-130			
DICHLOROMETHANE	4.69		ug/L	5.00		94	70-130			
ETHYLBENZENE	4.79		ug/L	5.00		96	70-130			
ETHYLENE DIBROMIDE	5.13		ug/L	5.00		103	70-130			
HEXACHLOROBUTADIENE	5.05		ug/L	5.00		101	70-130			
ISOPROPYLBENZENE	5.87		ug/L	5.00		117	70-130			
M/P-XYLENES	9.86		ug/L	10.0		99	70-130			
METHYL-TERT-BUTYL ETHER	4.86		ug/L	5.00		97	70-130			
NAPHTHALENE	4.67		ug/L	5.00		93	70-130			
N-BUTYLBENZENE	5.00		ug/L	5.00		100	70-130			
N-PROPYLBENZENE	4.86		ug/L	5.00		97	70-130			
ORTHO-XYLENE	4.88		ug/L	5.00		98	70-130			
SEC-BUTYLBENZENE	5.07		ug/L	5.00		101	70-130			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Volatile Organic Compounds by GC/MS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Reference (BH63103-SRM1)				Prepared & Analyzed: 08/31/2016						
Batch BH63103 - DEFAULT ORGANIC PREP										
STYRENE	4.71		ug/L	5.00		94	70-130			
TERT-BUTYLBENZENE	4.96		ug/L	5.00		99	70-130			
TETRACHLOROETHENE	4.88		ug/L	5.00		98	70-130			
TOLUENE	4.86		ug/L	5.00		97	70-130			
TRANS-1,2-DICHLOROETHENE	4.87		ug/L	5.00		97	70-130			
TRANS-1,3-DICHLOROPROPENE	4.98		ug/L	5.00		100	70-130			
TRICHLOROETHENE	5.06		ug/L	5.00		101	70-130			
TRICHLOROFLUOROMETHANE	5.27		ug/L	5.00		105	70-130			
VINYL CHLORIDE	4.29		ug/L	5.00		86	70-130			
Surrogate: BROMOFLUOROBENZENE (SURR.)	*4.94*		ug/L	*5.00*		*99*	*70-130*			
Surrogate: DIBROMOFLUOROMETHANE (SURR.)	*4.69*		ug/L	*5.00*		*94*	*70-130*			
Surrogate: TOLUENE-D8 (SURR.)	*4.85*		ug/L	*5.00*		*97*	*70-130*			

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI61603-BLK1)				Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	ND	0.0200	mg/L							
CALCIUM	ND	2.00	mg/L							
IRON	ND	0.0200	mg/L							
MAGNESIUM	ND	0.500	mg/L							
MANGANESE	ND	0.0200	mg/L							
POTASSIUM	ND	0.500	mg/L							
SODIUM	ND	2.00	mg/L							
LCS (BI61603-BS1)				Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	0.201	0.0200	mg/L	0.200		100	85-115			
CALCIUM	20.2	2.00	mg/L	20.0		101	85-115			
IRON	0.991	0.0200	mg/L	1.00		99.1	85-115			
MAGNESIUM	5.05	0.500	mg/L	5.00		101	85-115			
MANGANESE	0.200	0.0200	mg/L	0.200		100	85-115			
POTASSIUM	2.01	0.500	mg/L	2.00		100	85-115			
SODIUM	20.2	2.00	mg/L	20.0		101	85-115			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Total Metals by ICP - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BI61603-MS1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	0.244	0.0200	mg/L	0.200	0.0395	102	70-130			
CALCIUM	27.8	2.00	mg/L	20.0	7.87	99.8	70-130			
IRON	1.50	0.0200	mg/L	1.00	0.502	99.7	70-130			
MAGNESIUM	9.33	0.500	mg/L	5.00	4.12	104	70-130			
MANGANESE	0.205	0.0200	mg/L	0.200	0.00290	101	70-130			
POTASSIUM	3.53	0.500	mg/L	2.00	1.39	107	70-130			
SODIUM	193	2.00	mg/L	20.0	169	119	70-130			
Matrix Spike Dup (BI61603-MSD1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/16/2016						
Batch BI61603 - EPA 200.7/200.8										
BARIUM	0.244	0.0200	mg/L	0.200	0.0395	102	70-130	0.174	10	
CALCIUM	28.0	2.00	mg/L	20.0	7.87	101	70-130	0.694	10	
IRON	1.50	0.0200	mg/L	1.00	0.502	99.8	70-130	0.0273	10	
MAGNESIUM	9.41	0.500	mg/L	5.00	4.12	106	70-130	0.852	10	
MANGANESE	0.205	0.0200	mg/L	0.200	0.00290	101	70-130	0.113	10	
POTASSIUM	3.50	0.500	mg/L	2.00	1.39	106	70-130	0.781	10	
SODIUM	197	2.00	mg/L	20.0	169	138	70-130	2.04	10	

Total Metals by ICPMS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Total Metals by ICPMS - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI61501-BLK1)				Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	ND	0.00100	mg/L							
LEAD	ND	0.00100	mg/L							
LCS (BI61501-BS1)				Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	0.0113	0.00100	mg/L	0.0100		113	85-115			
LEAD	0.00984	0.00100	mg/L	0.0100		98.4	85-115			
Matrix Spike (BI61501-MS1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	0.0139	0.00100	mg/L	0.0100	0.00296	110	70-130			
LEAD	0.00960	0.00100	mg/L	0.0100	0.000361	92.4	70-130			
Matrix Spike Dup (BI61501-MSD1)	**Source: L161077-06**			Prepared: 09/08/2016 Analyzed: 09/13/2016						
Batch BI61501 - EPA 200.7/200.8										
ARSENIC	0.0140	0.00100	mg/L	0.0100	0.00296	110	70-130	0.151	10	
LEAD	0.00965	0.00100	mg/L	0.0100	0.000361	92.9	70-130	0.582	10	

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BH63105-DUP1)	**Source: L161080-01**			Prepared & Analyzed: 08/31/2016						
Batch BH63105 - Default Prep - Wet Chemistry										
TOTAL DISSOLVED SOLIDS	510	10.0	mg/L		507			0.590	5	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BI60110-MS1)	**Source: L160949-02**			Prepared & Analyzed: 08/31/2016						
Batch BI60110 - Default Prep - Wet Chemistry										
BROMIDE	0.9	0.104	mg/L	0.833	0.03	107	80-120			
CHLORIDE	116	3.12	mg/L	41.7	74.4	99.1	80-120			
FLUORIDE	1.1	0.104	mg/L	0.833	0.3	97.5	80-120			
NITRATE AS N	5.2	0.260	mg/L	4.17	1.0	101	80-120			
NITRITE AS N	1.3	0.104	mg/L	1.56	ND	86.1	80-120			
ORTHO PHOSPHATE AS P	0.8	0.208	mg/L	0.833	ND	97.4	80-120			
SULFATE	186	5.21	mg/L	41.7	145	98.8	80-120			
Matrix Spike Dup (BI60110-MSD1)	**Source: L160949-02**			Prepared & Analyzed: 08/31/2016						
Batch BI60110 - Default Prep - Wet Chemistry										
BROMIDE	0.9	0.104	mg/L	0.833	0.03	108	80-120	0.743	10	
CHLORIDE	116	3.12	mg/L	41.7	74.4	99.0	80-120	0.0430	10	
FLUORIDE	1.1	0.104	mg/L	0.833	0.3	97.6	80-120	0.0370	10	
NITRATE AS N	5.2	0.260	mg/L	4.17	1.0	101	80-120	0.0934	10	
NITRITE AS N	1.3	0.104	mg/L	1.56	ND	86.1	80-120	0.0620	10	
ORTHO PHOSPHATE AS P	0.8	0.208	mg/L	0.833	ND	98.6	80-120	1.20	10	
SULFATE	186	5.21	mg/L	41.7	145	98.7	80-120	0.0130	10	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BI60111-MS1)	**Source: L160949-08**			Prepared & Analyzed: 08/31/2016						
Batch BI60111 - Default Prep - Wet Chemistry										
BROMIDE	1.0	0.104	mg/L	0.833	0.07	106	80-120			
CHLORIDE	113	3.12	mg/L	41.7	71.1	100	80-120			
FLUORIDE	1.1	0.104	mg/L	0.833	0.3	98.6	80-120			
NITRATE AS N	5.6	0.260	mg/L	4.17	1.4	101	80-120			
NITRITE AS N	1.4	0.104	mg/L	1.56	ND	86.8	80-120			
ORTHO PHOSPHATE AS P	0.8	0.208	mg/L	0.833	ND	99.0	80-120			
SULFATE	165	5.21	mg/L	41.7	124	99.9	80-120			
Matrix Spike Dup (BI60111-MSD1)	**Source: L160949-08**			Prepared & Analyzed: 09/01/2016						
Batch BI60111 - Default Prep - Wet Chemistry										
BROMIDE	1.0	0.104	mg/L	0.833	0.07	107	80-120	0.980	10	
CHLORIDE	113	3.12	mg/L	41.7	71.1	100	80-120	0.0258	10	
FLUORIDE	1.1	0.104	mg/L	0.833	0.3	98.6	80-120	0.0465	10	
NITRATE AS N	5.6	0.260	mg/L	4.17	1.4	102	80-120	0.0837	10	
NITRITE AS N	1.4	0.104	mg/L	1.56	ND	87.0	80-120	0.192	10	
ORTHO PHOSPHATE AS P	0.8	0.208	mg/L	0.833	ND	101	80-120	2.03	10	
SULFATE	166	5.21	mg/L	41.7	124	100	80-120	0.0469	10	
Blank (BI60201-BLK1)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BI60201-BLK2)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
Blank (BI60201-BLK3)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
Blank (BI60201-BLK4)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
Blank (BI60201-BLK5)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	ND	0.25	mg/L							
LCS (BI60201-BS1)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	4.67		mg/L	5.00		93	90-110			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BI60201-BS2)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	9.31		mg/L	10.0		93	90-110			
LCS (BI60201-BS3)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	4.75		mg/L	5.00		95	90-110			
LCS (BI60201-BS4)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	9.42		mg/L	10.0		94	90-110			
LCS (BI60201-BS5)				Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	4.66		mg/L	5.00		93	90-110			
MRL Check (BI60201-MRL1)				Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	0.254		mg/L	0.250		102	50-150			

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BI60201-MS1)	**Source: L160949-02**			Prepared & Analyzed: 09/02/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	1.30		mg/L	0.900	0.473	92	83-108			
Matrix Spike (BI60201-MS2)	**Source: L161078-04**			Prepared & Analyzed: 09/03/2016						
Batch BI60201 - DEFAULT ORGANIC PREP										
TOTAL ORGANIC CARBON	1.11		mg/L	0.900	0.318	88	83-108			
Duplicate (BI60206-DUP1)	**Source: L161080-01**			Prepared & Analyzed: 09/02/2016						
Batch BI60206 - Default Prep - Wet Chemistry										
ALKALINITY, TOTAL	106	20.0	mg/L as CaCO3		108			1.22	10	
Matrix Spike (BI60206-MS1)	**Source: L161080-01**			Prepared & Analyzed: 09/02/2016						
Batch BI60206 - Default Prep - Wet Chemistry										
ALKALINITY, TOTAL	170	20.0	mg/L as CaCO3	59.0	108	106	80-120			
Duplicate (BI60207-DUP1)	**Source: L161102-02**			Prepared & Analyzed: 09/02/2016						
Batch BI60207 - Default Prep - Wet Chemistry										
ALKALINITY, TOTAL	137	20.0	mg/L as CaCO3		138			0.705	10	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Wet Chemistry - Quality Control

Tucson Water Quality Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BI60207-MS1)	**Source: L161102-02**			Prepared & Analyzed: 09/02/2016						
Batch BI60207 - Default Prep - Wet Chemistry										
ALKALINITY, TOTAL	192	20.0	mg/L as CaCO3	59.0	138	92.2	80-120			
Duplicate (BI60208-DUP1)	**Source: L161078-03**			Prepared & Analyzed: 09/02/2016						
Batch BI60208 - Default Prep - Wet Chemistry										
TOTAL DISSOLVED SOLIDS	675	10.0	mg/L		680			0.738	5	

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Certified Analyses included in this Report

Analyte	Certifications

Code	Description	Number	Expires

Tucson Water Quality Lab
4401 S. Tucson Estates Pkwy.
Tucson, AZ 85735
(520) 837-2455

Environmental Services	Project: Tumamoc Landfill	
-	Project Number: P01025	**Reported:**
Tucson AZ, 85726	Project Manager: Arturo Burgos	09/26/2016 09:58

Notes and Definitions

N1	Associated Matrix spike recovery outside acceptance limits. Associated spiked sample not from this sample set.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Items for Project Manager Review

LabNumber	Analysis	Analyte	Exception
			Data included from: \ \166.89.22.21\ElementServerFolders\TransferIn\L161078 TRANSFER 09 15 2016 1302.

TUCSON WATER CHAIN OF CUSTODY

LOGIN ID: L161078

CLIENT: ES

PROJECT NAME/FREQUENCY: Tumamoc Landfill ANNUAL

PROJECT #:P01025

SAMPLING DATE: 8/31/16

SAMPLED BY: print full name: Kayla Virgone

signature: Kayla Virgone

SAMPLE #	TIME	LOCATION	SITE	NUMBER OF CONTAINERS	PRESERVATIVE	(Na2S2O3)	(Unpreserved)	(HNO3)	(H2SO4)	(NaS2O3/H2SO4)	(Unpreserved)	(NaS2O3/H2SO4)	(H2SO4)	(HCl)	(NP)	(Na2S2O3)	(Unpreserved)	(H2SO4)	HCl)	(NaOH/Zinc Acetate)	COMMENTS
																EEA	EEA	EEA	EEA	EEA	
																EEA	EEA	EEA	EEA	EEA	
																EEA	EEA	EEA	EEA	EEA	
								ICP	ICP	ICP	ICP	ICP	ICPMS	CVAA			Anions - Alkalinity - TDS		TOC	8260	Ammonia	
-01	0745	WR-449A	WELL	10					X	X	X	X				X		X	X		X	TB- 07
-02	0805	WR-384A	WELL	10					X	X	X	X				X		X	X		X	TB-
-03	0840	WR-445A	WELL	10					X	X	X	X				X		X	X		X	TB-
-04	0930	WR385A	WELL	10					X	X	X	X				X		X	X		X	TB-
-05	0950	~~WR-385B~~	WELL	10					X	X	X	X				X		X	X		X	TB-
~~-06~~		WR-385B KV 8/31/16		~~10~~					X	X	X	X				X		X	X		X	TB- KV 9/2/16
-07	0745	Trip Blank	TWQL	2															X			Lot# 060116

COMMENTS: Use designated bottles for high alkalinity wells - see reverse

SPECIAL TURNAROUND TIME:

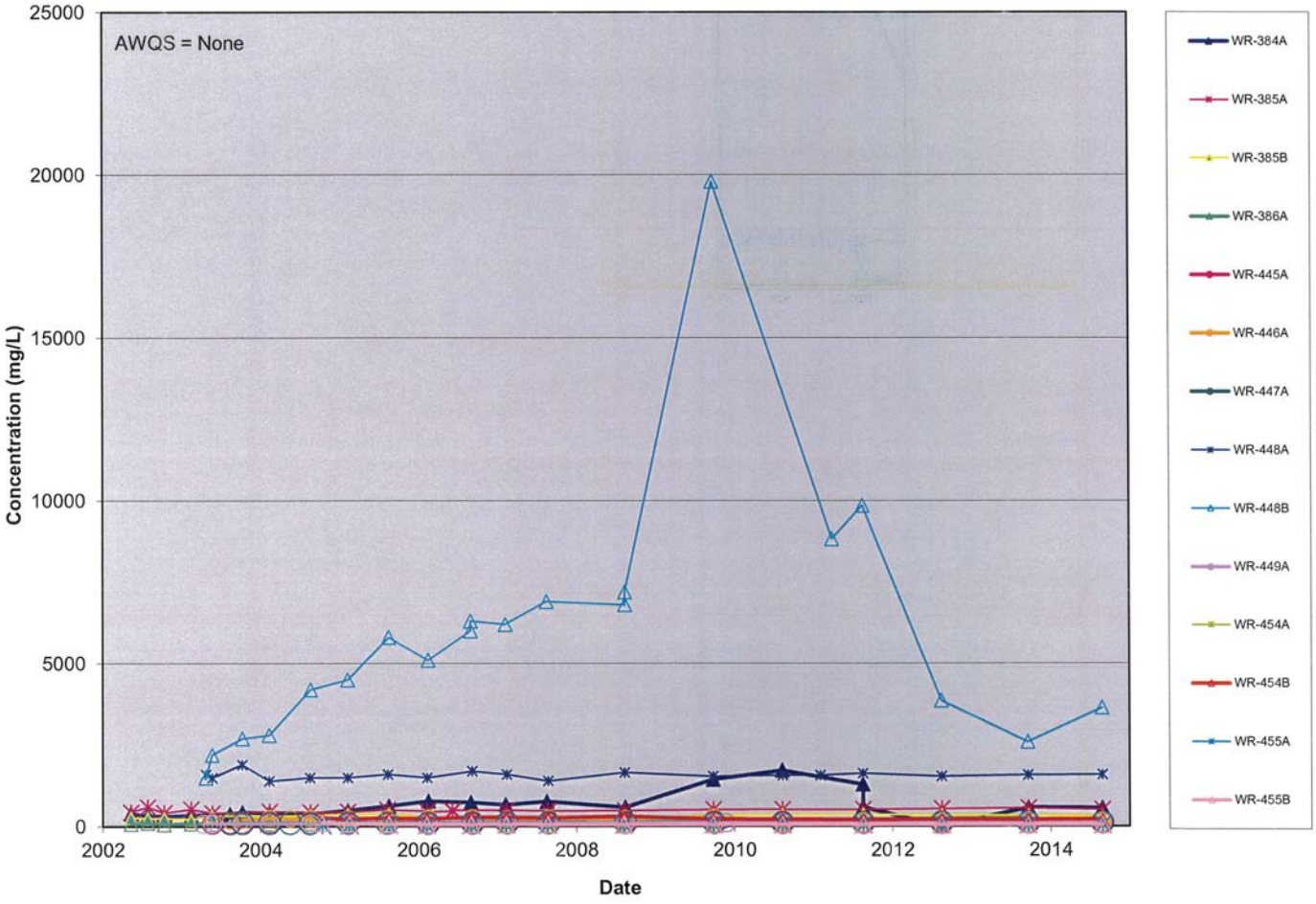
	SIGNATURE	DATE/TIME		SIGNATURE	DATE/TIME
RELINQUISHED BY:	Kayla Virgone	8/31/16 1149	RECEIVED BY:	Diane Iverson	8-31-16 1159
RELINQUISHED BY:		09/01/16 1500	RECEIVED BY:	UPS: 1ZYR80260199223944	09/01/16 1500
RELINQUISHED BY:			RECEIVED BY:		

RECEIVING TEMPERATURE= 3.8 °C

APPENDIX D

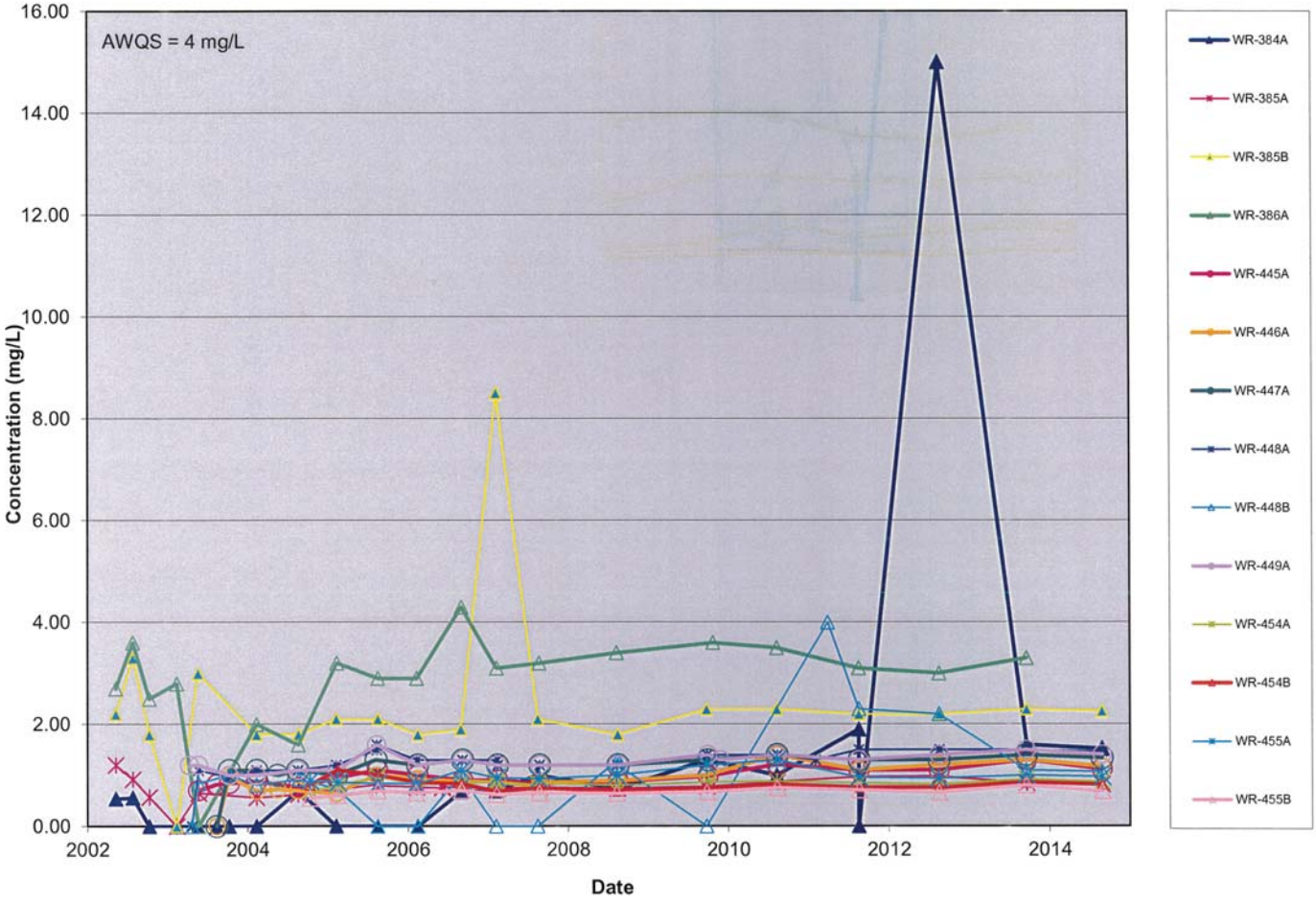
Trend Charts for Selected Compounds in the Groundwater

Sulfate



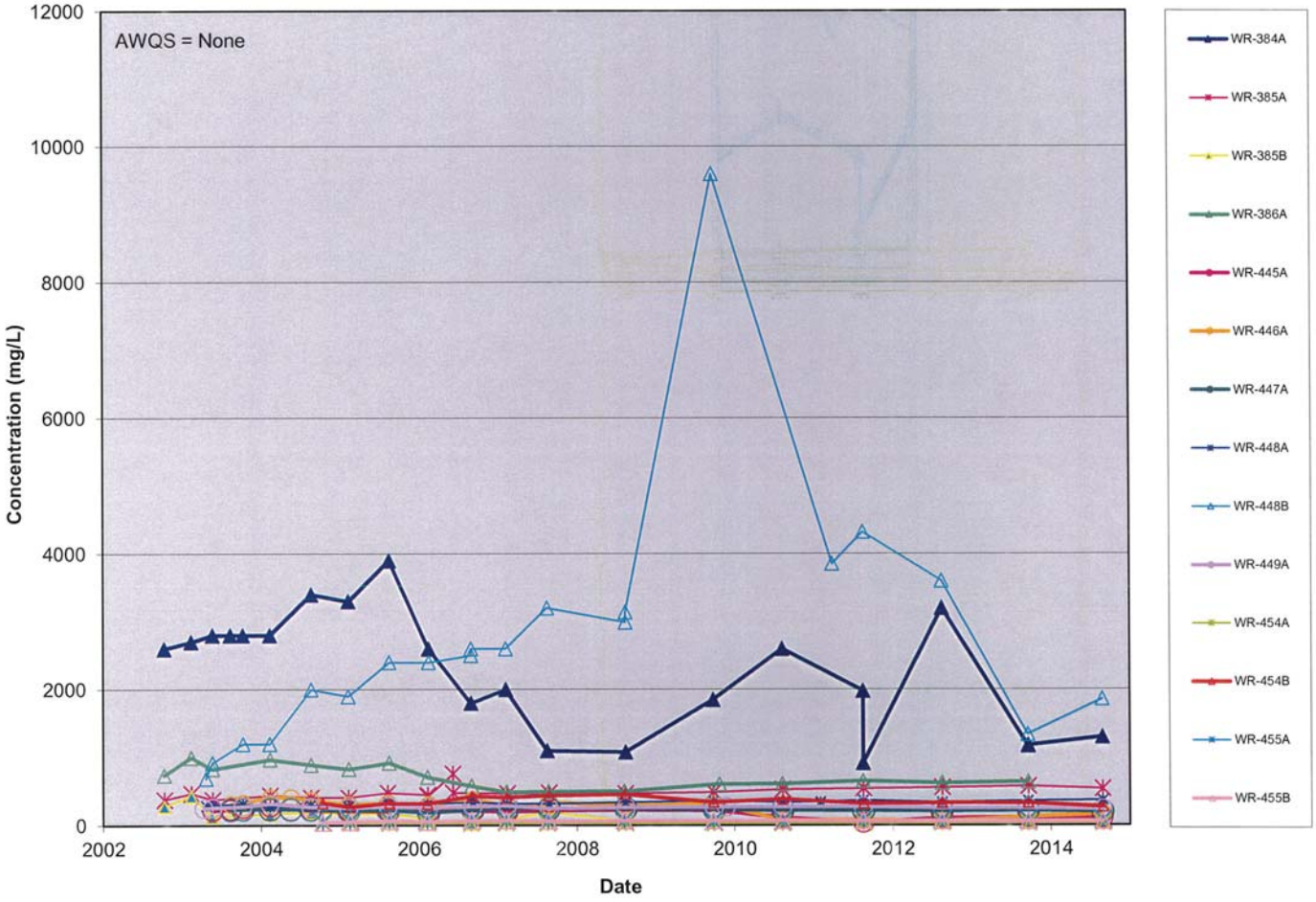
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Fluoride



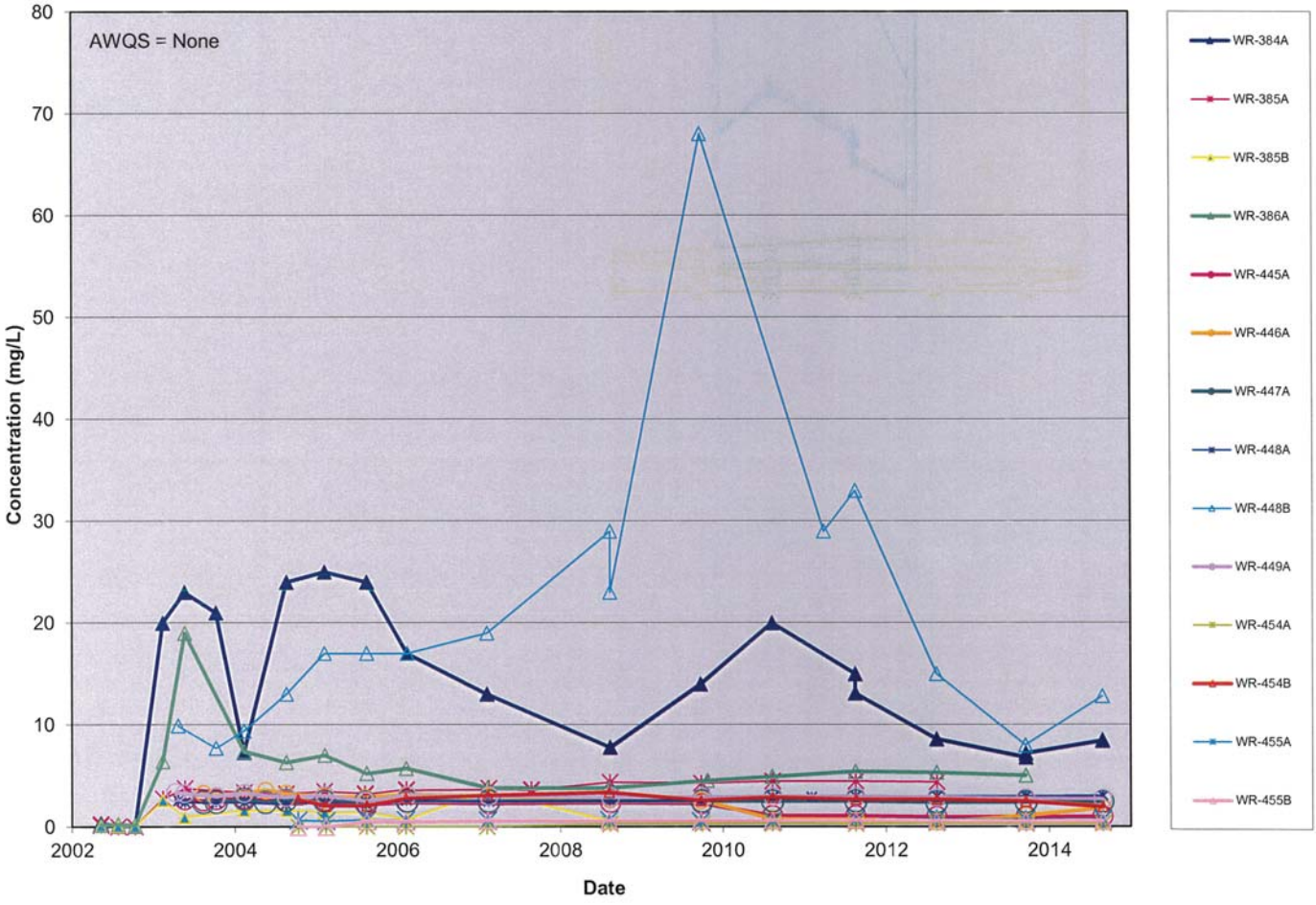
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Chloride



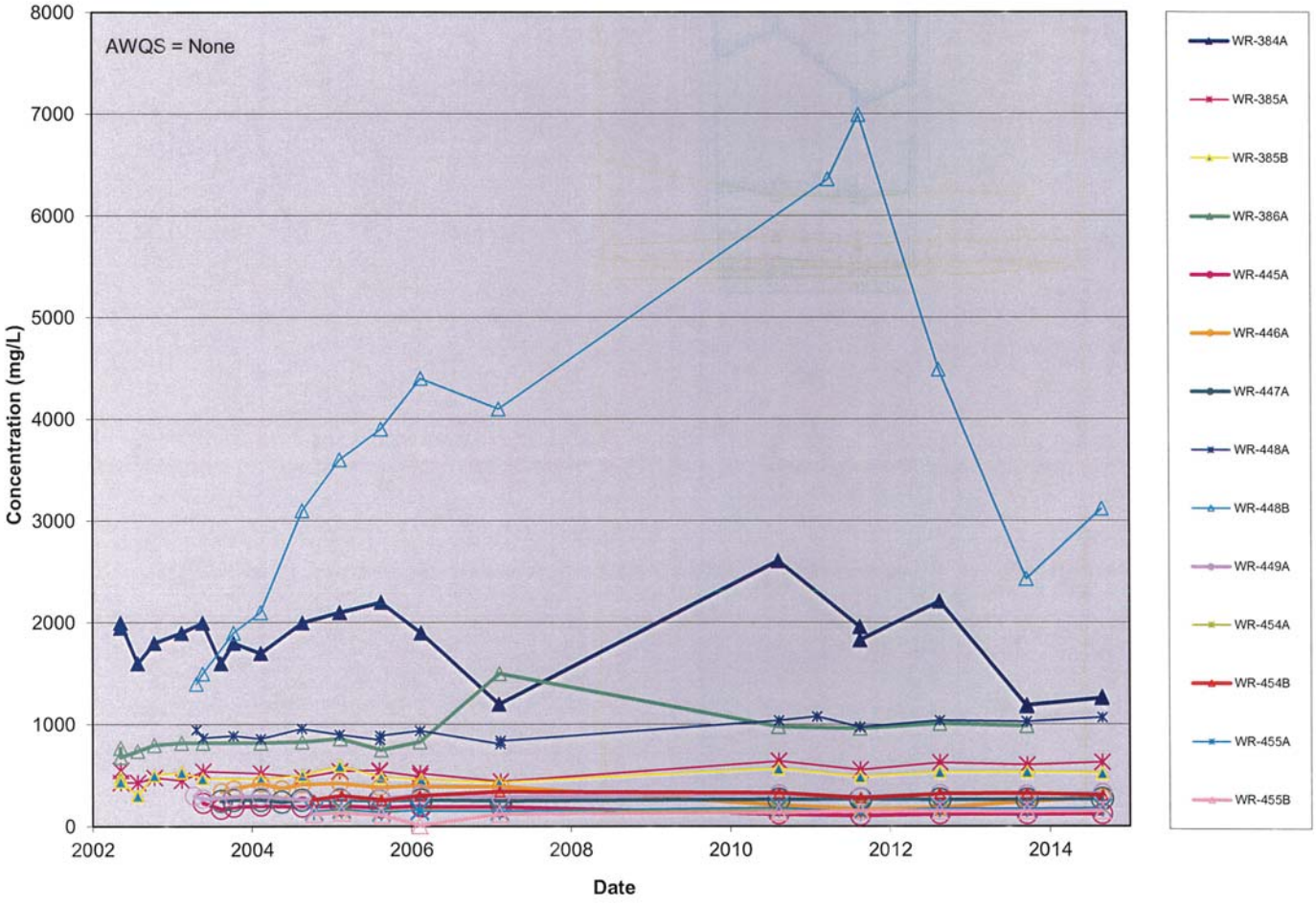
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Bromide



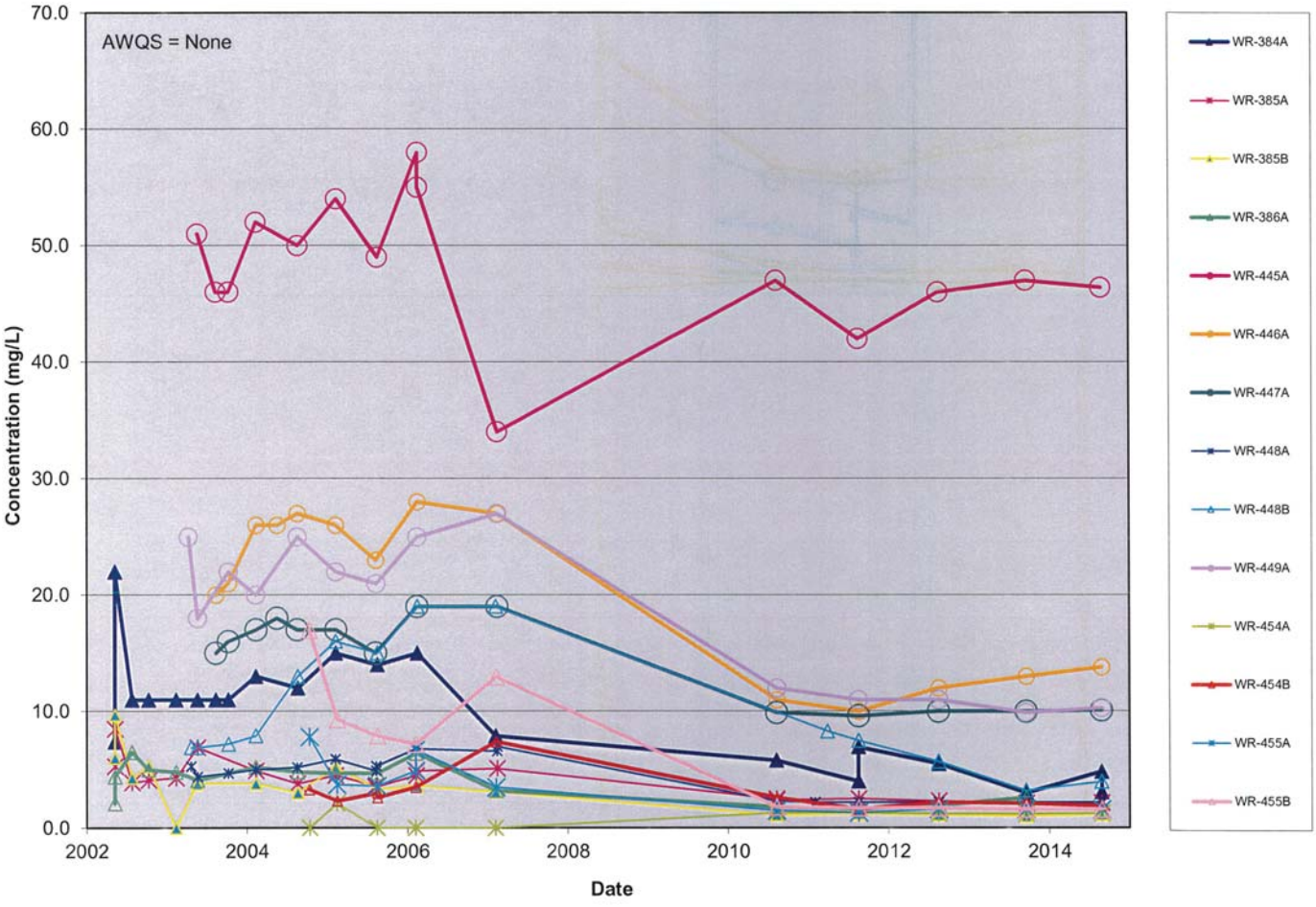
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Sodium



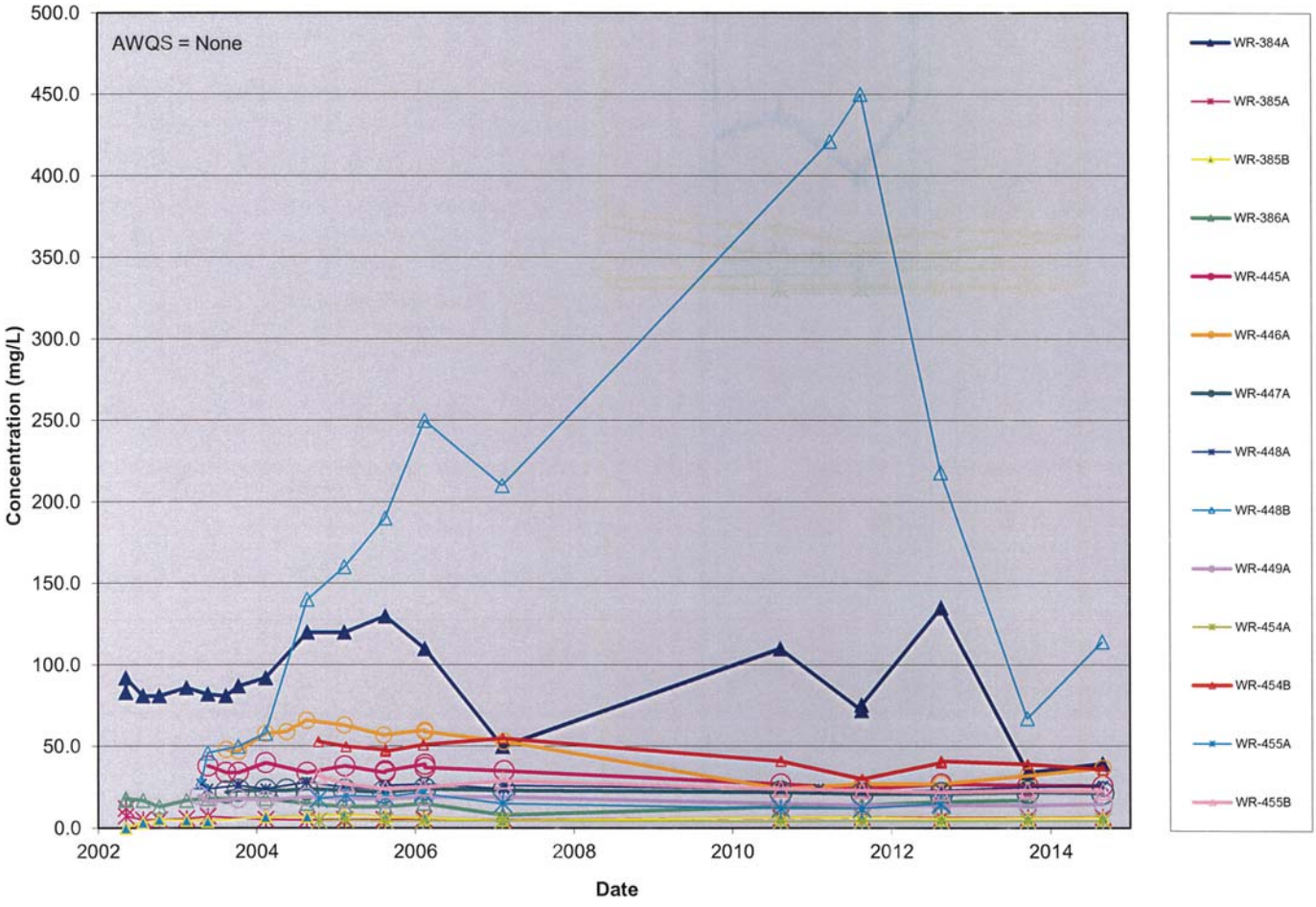
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Potassium



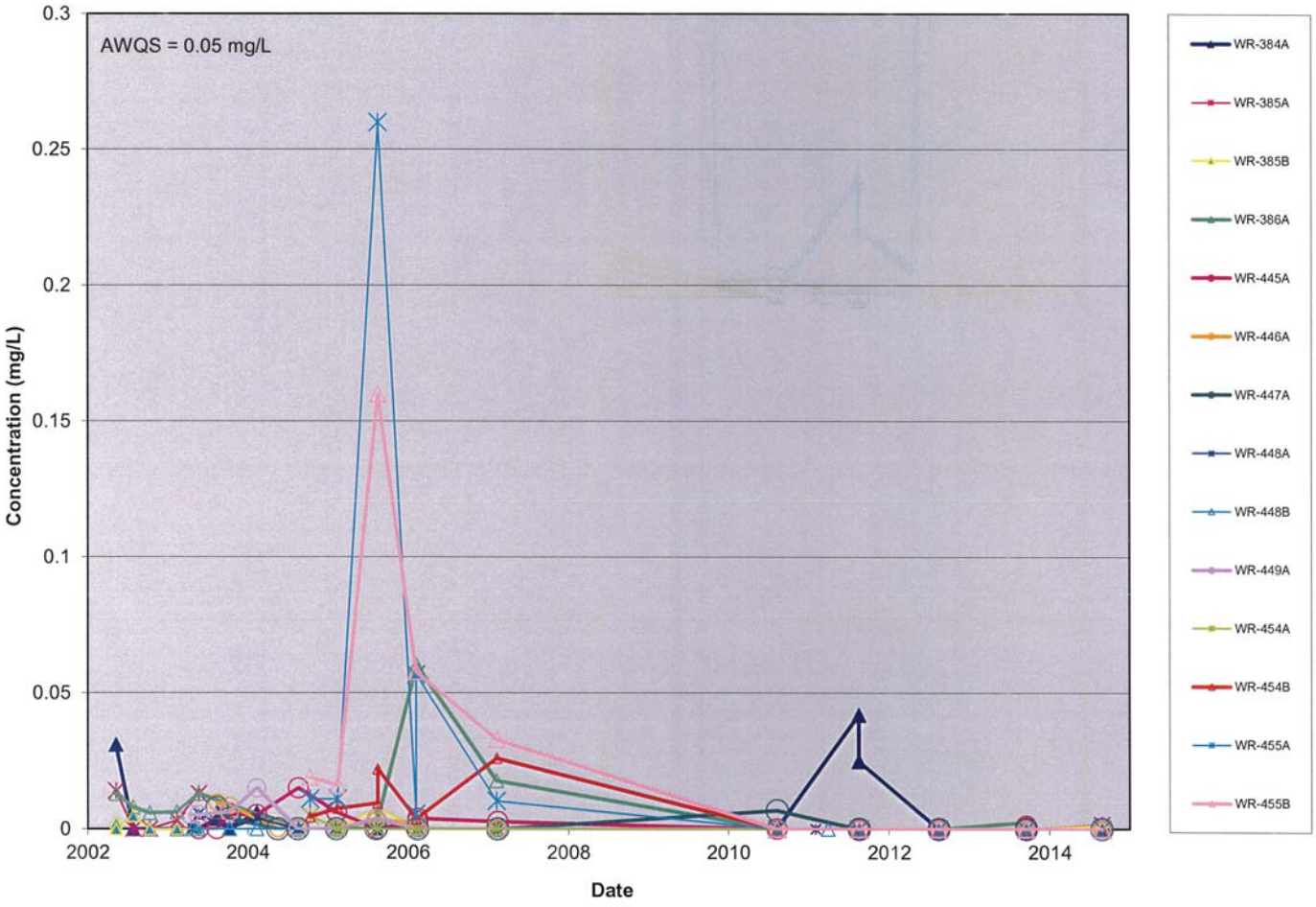
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Magnesium



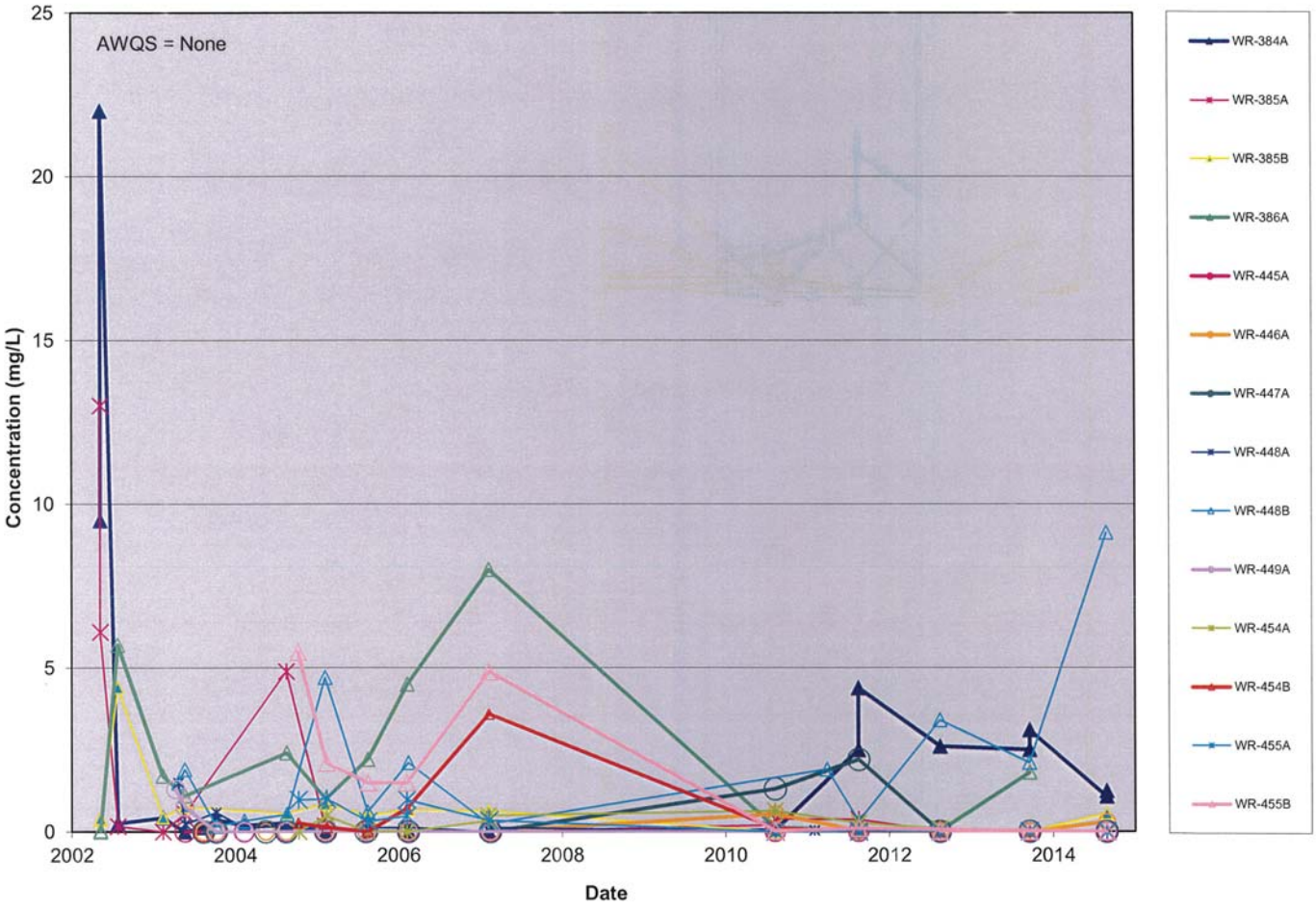
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Lead



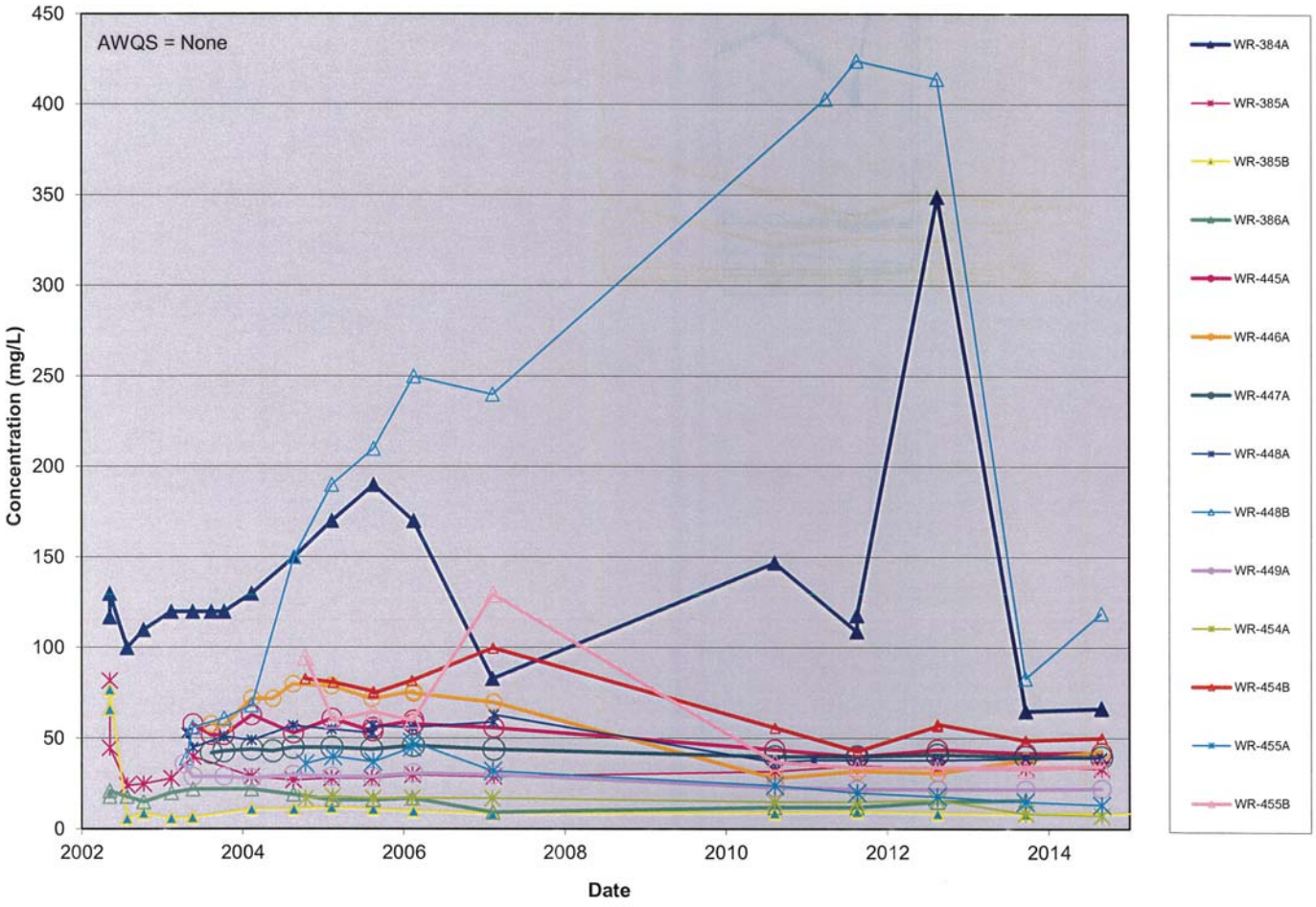
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Iron



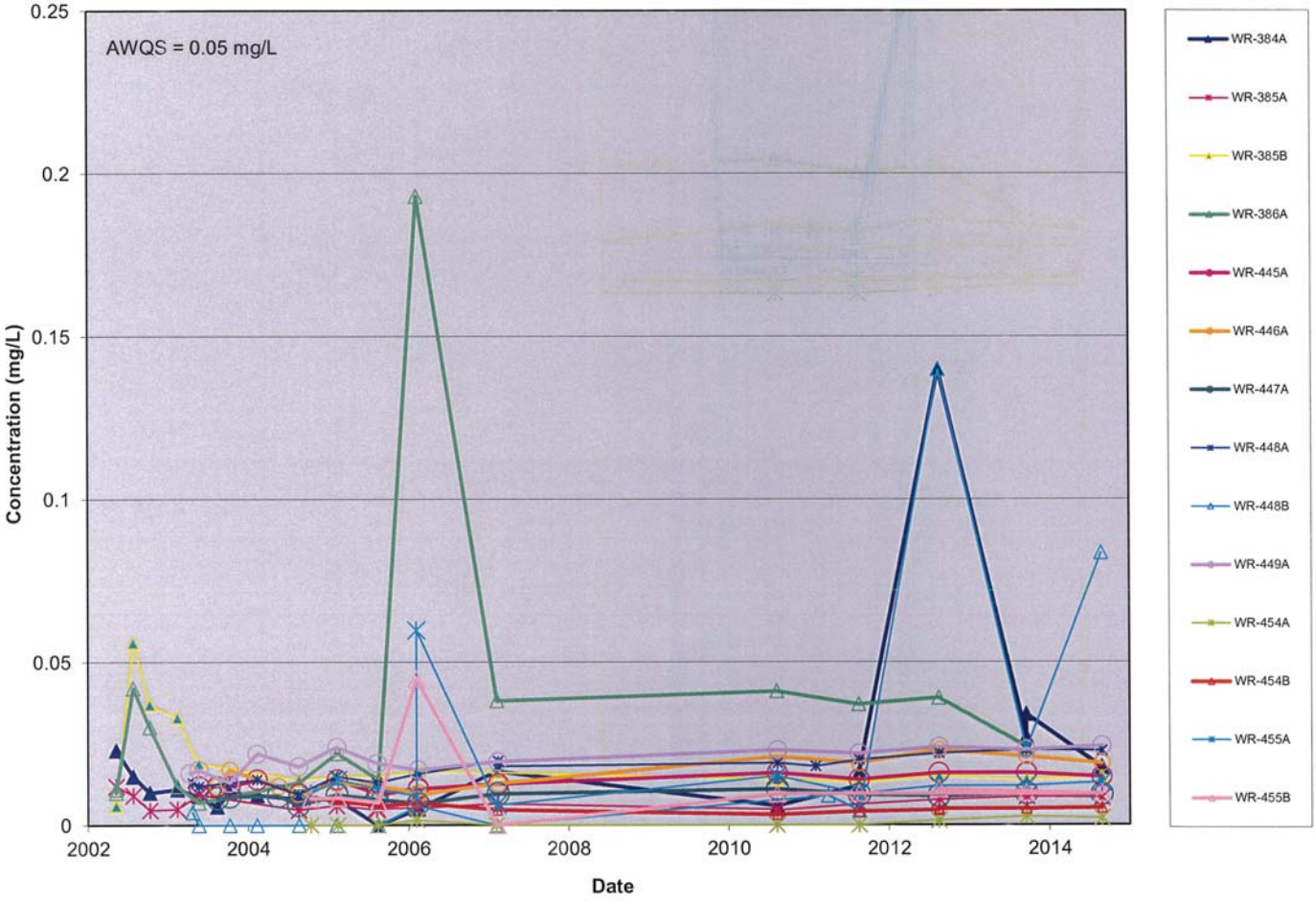
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Calcium



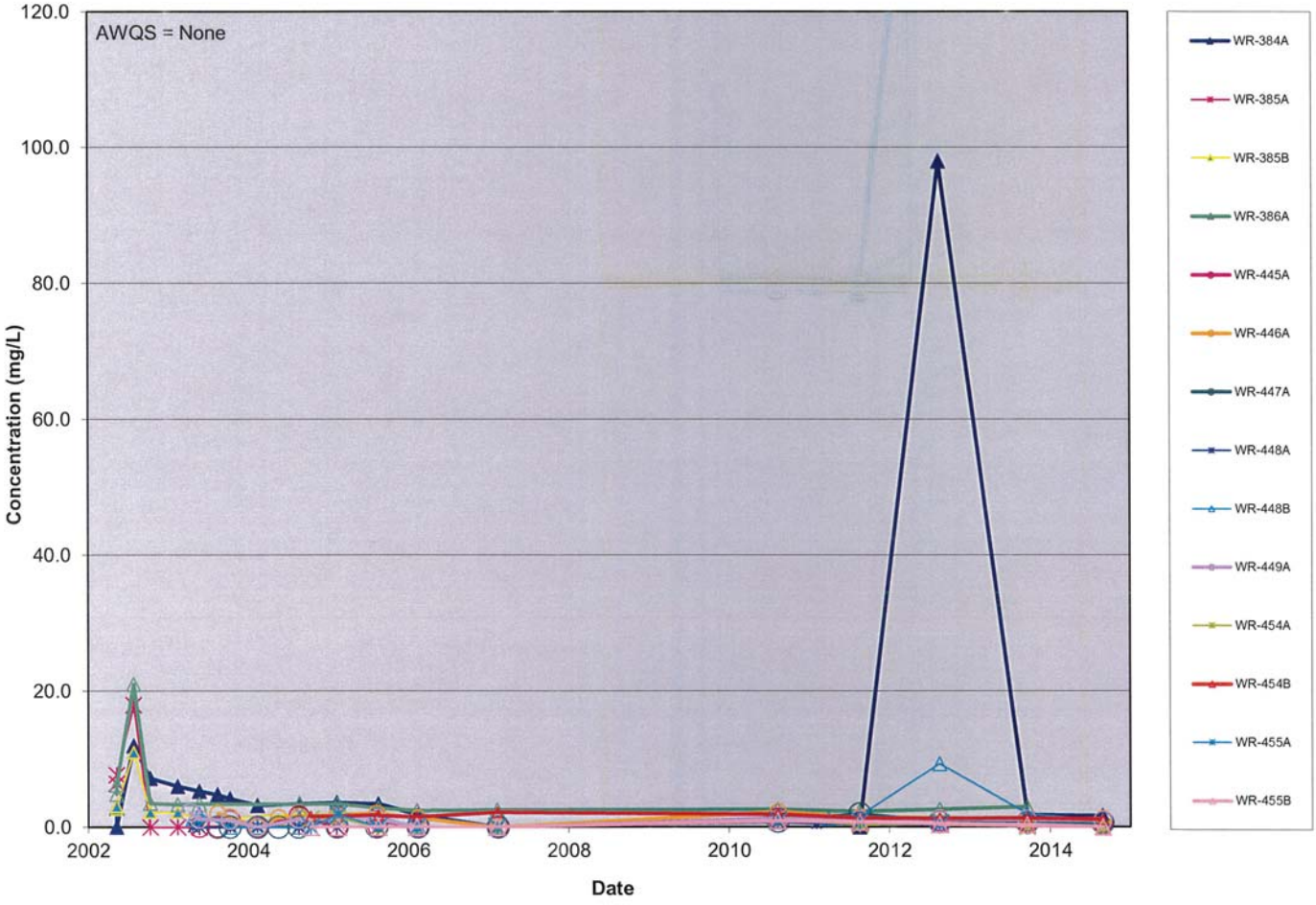
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Arsenic



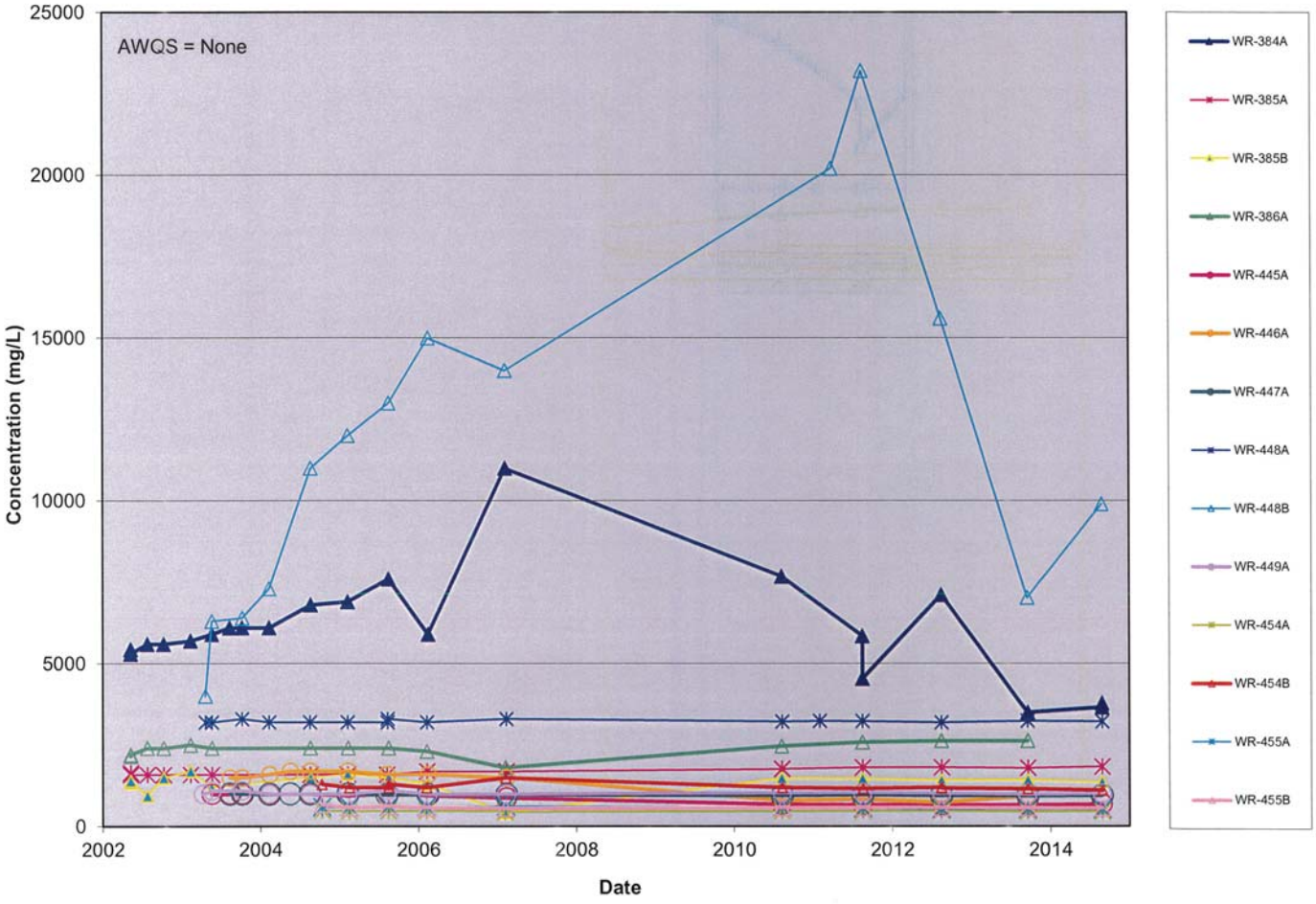
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Total Organic Carbon



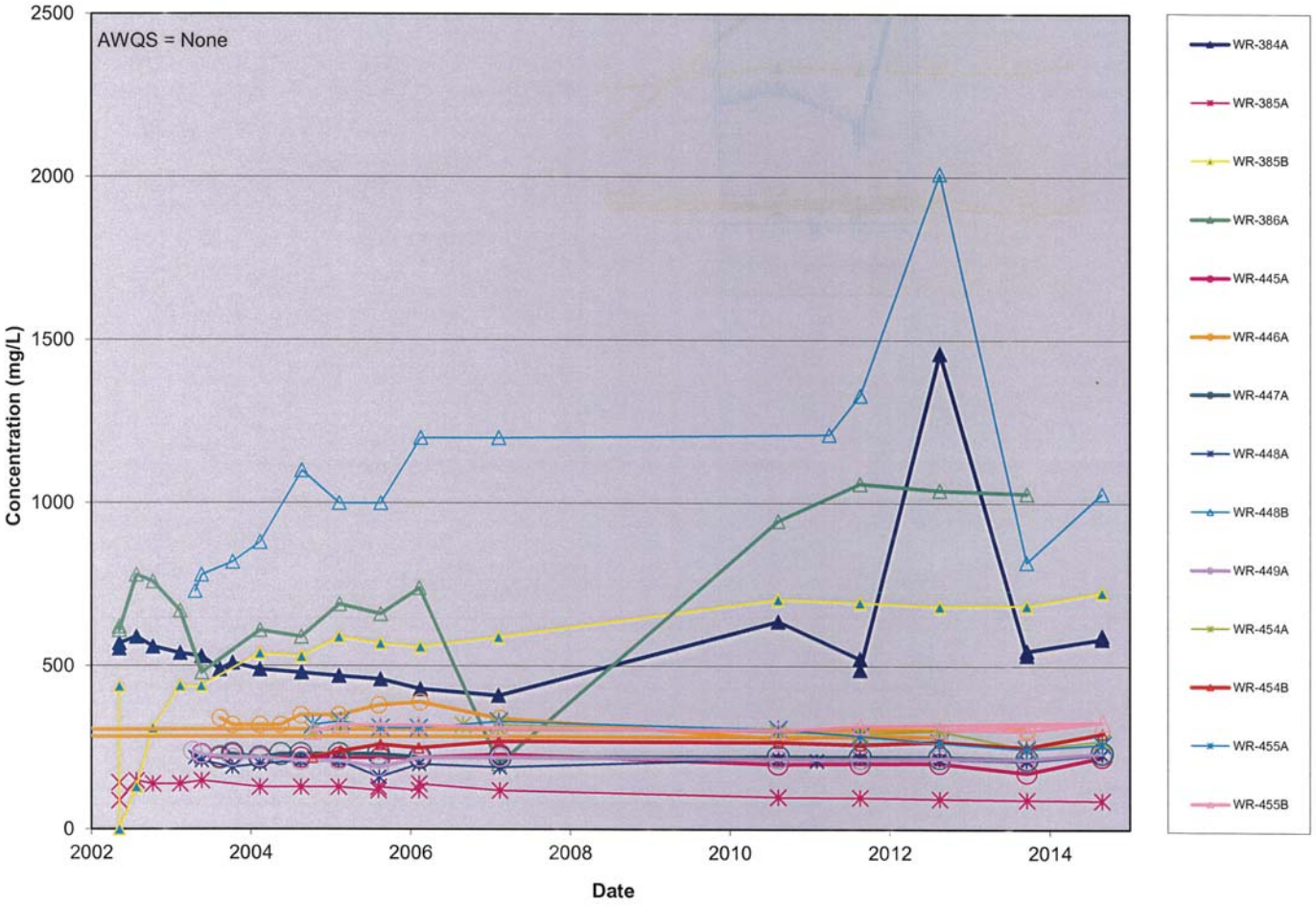
Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Total Dissolved Solids



Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

Alkalinity (Bicarbonate)



Note: Shapes on lines indicate well's screened interval: shallow are triangles, deep are stars, and long are circles.

APPENDIX E

Landfill Gas Monitoring Field Results for 2016

Tumamoc Landfill
Methane Monitoring
(TU1-9)
QUARTERLY MONITORING

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Pressure
LGGAM 3.01L 16/10/07		%	%	%	%	inches Hg	inches H2O
TU000110	1/5/2016 10:43	0.0	1.1	19.6	79.3	27.45	0.01
TU000125	1/5/2016 10:46	0.0	1.0	19.7	79.3	27.46	0.01
TU000210	1/5/2016 10:36	0.0	2.6	18.0	79.4	27.45	0.01
TU000225	1/5/2016 10:39	0.0	0.5	20.0	79.5	27.46	0.00
TU000310	1/5/2016 10:31	0.0	0.6	20.2	79.2	27.45	0.01
TU000330	1/5/2016 10:33	0.0	4.5	17.1	78.4	27.45	0.01
TU000410	1/5/2016 10:22	0.0	0.3	20.5	79.2	27.45	0.00
TU000430	1/5/2016 10:24	0.0	0.4	20.2	79.4	27.45	0.00
TU000510	1/5/2016 10:16	0.0	0.4	20.5	79.1	27.45	0.02
TU000535	1/5/2016 10:18	0.0	0.2	20.5	79.3	27.44	0.01
TU000610	1/5/2016 10:10	0.0	0.6	20.3	79.1	27.45	0.01
TU000635	1/5/2016 10:12	0.0	0.8	20.1	79.1	27.45	0.01
TU000710	1/5/2016 10:04	0.0	0.7	20.1	79.2	27.46	0.01
TU000735	1/5/2016 10:07	0.0	0.2	20.6	79.2	27.45	0.02
TU000810	1/5/2016 9:57	0.0	2.0	19.2	78.8	27.46	0.01
TU000825	1/5/2016 9:59	0.0	3.3	17.5	79.2	27.46	0.01
TU000910	1/5/2016 9:36	0.0	3.2	17.6	79.2	27.47	0.00
TU000925	1/5/2016 9:39	0.0	6.5	15.4	78.1	27.47	0.00

Note: GEM2000 ID: 11158 Monitored by: G. Bejarano

GEM2000 was calibrated using 15% methane (see G. B.calibration sheet on this date)

Pressure readings were taken using Dwyer Series Mark III "A" digital manometer

Note: calibIDS is calibration gas being used a machine calibration check.

calibIDS zero is ambient air also can be used a machine calibration check.

Note: Accuracy of the machine is +/- 0.3% at methane concentrations of less than < 5.0%

GAS record LOT 43358-63 EXP 12 2016

Tumamoc Landfill
Methane Monitoring
Wells (all, qtly)

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Pressure
		%	%	%	%	inches Hg	inches H2O
TU000110	4/12/2016 8:28	0.0	1.3	19.3	79.4	27.7	0.00
TU000125	4/12/2016 8:31	0.0	1.4	19.2	79.4	27.6	0.00
TU000210	4/12/2016 8:38	0.0	2.2	18.2	79.6	27.6	0.00
TU000225	4/12/2016 8:40	0.0	3.7	16.4	79.9	27.6	0.00
TU000310	4/12/2016 8:45	0.0	2.4	18.5	79.1	27.6	0.00
TU000330	4/12/2016 8:48	0.0	3.0	18.1	78.9	27.6	0.00
TU000410	4/12/2016 8:55	0.0	0.5	20.3	79.2	27.6	0.01
TU000430	4/12/2016 8:57	0.0	0.3	20.2	79.5	27.6	0.01
TU000510	4/12/2016 9:02	0.0	0.3	20.3	79.4	27.6	0.00
TU000535	4/12/2016 9:04	0.0	0.3	20.3	79.4	27.6	0.01
TU000610	4/12/2016 9:08	0.0	0.6	19.9	79.5	27.6	0.01
TU000635	4/12/2016 9:11	0.0	0.7	19.9	79.4	27.6	0.02
TU000710	4/12/2016 9:15	0.0	0.8	19.7	79.5	27.6	0.00
TU000735	4/12/2016 9:18	0.0	0.4	20.1	79.5	27.6	0.01
TU000810	4/12/2016 9:27	0.0	1.5	19.0	79.5	27.6	0.00
TU000825	4/12/2016 9:30	0.0	2.5	18.1	79.4	27.6	0.00
TU000910	4/12/2016 8:12	0.0	3.2	18.1	78.7	27.6	-0.01
TU000925	4/12/2016 8:14	0.0	4.6	16.8	78.6	27.7	-0.01
Note: GEM2000 ID: 11158		Monitored by: K. Virgone					
GEM2000 was calibrated using 15% methane (see K.V. calibration sheet for this date).							
Pressure readings were taken with the D.S. Mark III "H" digital manometer.							
Accuracy of the machine is +/-0.3% at methane concentrations of less than <5.0%.							

Tumamoc Landfill
Methane Monitoring
Wells (all, qtly)

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Pressure
		%	%	%	%	inches Hg	inches H2O
TU000110	4/12/2016 8:28	0.0	1.3	19.3	79.4	27.7	0.00
TU000125	4/12/2016 8:31	0.0	1.4	19.2	79.4	27.6	0.00
TU000210	4/12/2016 8:38	0.0	2.2	18.2	79.6	27.6	0.00
TU000225	4/12/2016 8:40	0.0	3.7	16.4	79.9	27.6	0.00
TU000310	4/12/2016 8:45	0.0	2.4	18.5	79.1	27.6	0.00
TU000330	4/12/2016 8:48	0.0	3.0	18.1	78.9	27.6	0.00
TU000410	4/12/2016 8:55	0.0	0.5	20.3	79.2	27.6	0.01
TU000430	4/12/2016 8:57	0.0	0.3	20.2	79.5	27.6	0.01
TU000510	4/12/2016 9:02	0.0	0.3	20.3	79.4	27.6	0.00
TU000535	4/12/2016 9:04	0.0	0.3	20.3	79.4	27.6	0.01
TU000610	4/12/2016 9:08	0.0	0.6	19.9	79.5	27.6	0.01
TU000635	4/12/2016 9:11	0.0	0.7	19.9	79.4	27.6	0.02
TU000710	4/12/2016 9:15	0.0	0.8	19.7	79.5	27.6	0.00
TU000735	4/12/2016 9:18	0.0	0.4	20.1	79.5	27.6	0.01
TU000810	4/12/2016 9:27	0.0	1.5	19.0	79.5	27.6	0.00
TU000825	4/12/2016 9:30	0.0	2.5	18.1	79.4	27.6	0.00
TU000910	4/12/2016 8:12	0.0	3.2	18.1	78.7	27.6	-0.01
TU000925	4/12/2016 8:14	0.0	4.6	16.8	78.6	27.7	-0.01

Note: GEM2000 ID: 11158 Monitored by: K. Virgone

GEM2000 was calibrated using 15% methane (see K.V. calibration sheet for this date).

Pressure readings were taken with the D.S. Mark III "H" digital manometer.

Accuracy of the machine is +/-0.3% at methane concentrations of less than <5.0%.

Tumamoc Landfill
Methane Monitoring
Wells (all, qtly)

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Pressure
		%	%	%	%	inches Hg	inches H2O
TU000110	10/7/2016 8:22	0.0	1.6	19.3	79.1	27.3	0.00
TU000125	10/7/2016 8:25	0.0	1.0	19.7	79.3	27.3	0.00
TU000210	10/7/2016 8:29	0.0	3.3	17.2	79.5	27.3	0.00
TU000225	10/7/2016 8:31	0.0	0.9	19.6	79.5	27.3	0.01
TU000310	10/7/2016 8:36	0.0	3.3	17.8	78.9	27.3	0.00
TU000330	10/7/2016 8:38	0.0	3.4	17.8	78.8	27.3	0.01
TU000410	10/7/2016 8:44	0.0	0.8	19.4	79.8	27.3	0.00
TU000430	10/7/2016 8:46	0.0	0.4	19.6	80.0	27.3	0.00
TU000510	10/7/2016 8:50	0.0	0.5	19.8	79.7	27.3	0.01
TU000535	10/7/2016 8:52	0.0	0.4	19.9	79.7	27.3	0.00
TU000610	10/7/2016 8:56	0.0	1.0	19.3	79.7	27.3	0.00
TU000635	10/7/2016 8:59	0.0	0.9	19.3	79.8	27.3	0.00
TU000710	10/7/2016 9:03	0.0	0.9	19.3	79.8	27.3	0.01
TU000735	10/7/2016 9:05	0.0	0.3	19.8	79.9	27.3	0.00
TU000810	10/7/2016 9:10	0.0	2.1	18.3	79.6	27.3	0.00
TU000825	10/7/2016 9:13	0.0	1.6	18.6	79.8	27.3	0.01
TU000910	10/7/2016 8:13	0.0	4.1	16.4	79.5	27.3	0.00
TU000925	10/7/2016 8:15	0.0	5.8	15.8	78.4	27.3	0.00

Note: GEM2000 ID: 11158 Monitored by: L. Clark

GEM2000 was calibrated using 15% methane (see L.C. calibration sheet for this date).

Pressure readings were taken with the D.S. Mark III "C" digital manometer.

Accuracy of the machine is +/-0.3% at methane concentrations of less than <5.0%.

APPENDIX F

Landfill Inspection Report

Engineering and Environmental Consultants, Inc.
4625 East Fort Lowell Road | Tucson, Arizona 85712 | Tel 520.321.4625 | Fax 520.321.0333

October 25, 2016

Mr. Arturo Burgos
Mr. Tom Ryan
City of Tucson, Environmental Services
4004 South Park Ave., Building 1
Tucson, Arizona 85726

Re: Annual Closed Landfill Inspection – Tumamoc Landfill

INTRODUCTION

On October 6, 2016, Engineering and Environmental Consultants, Inc. (EEC) performed the annual field inspection at the closed Tumamoc Landfill. Tumamoc Landfill was operated by the City of Tucson as a Municipal Solid Waste facility during the 1960s. The landfill was the subject of a final cap and closure project in 2013. Improvements included installation of an engineered evapo-transpiration soil cap, erosion protection including gabion mattress drainage protection, and hydroseeding of the landfill cap.

Annual inspections are required at City of Tucson owned non-regulated closed landfills in accordance with the guidance document entitled "COT Closed Landfills Inspection and Maintenance Reporting and Procedures, March 2011". This guidance document was internally prepared by the City of Tucson Environmental Services Department (COT-ES).

Key elements of this inspection report are:

- A narrative summary of facility conditions including recommended corrective action(s) to be undertaken prior to the next scheduled inspection
- The Landfill Inspection Table used to document observed conditions (Attachment 1)
- An inspection photo log (Attachment 2)

INSPECTION SUMMARY

The annual field inspection of Tumamoc Landfill is organized and conducted using the inspection report table included in the COT-ES inspection guidance document. A copy of the table filled out during this inspection is included with this report (Attachment 1). The table lists specific landfill items that must be inspected and provides space to comment on the conditions encountered during the inspection. The items inspected and the current conditions of these features at Tumamoc Landfill are summarized as follows:

Perimeter Security Fence and Gates

The landfill is secured from vehicular traffic with a locked gate on the south side along Starr Pass Road. The east, west, and north boundaries of the landfill are undeveloped desert and are unfenced.

Inspection Roads
The central portion of the south perimeter access road is badly rutted due to storm runoff. If not repaired, the road may become impassable as the result of future storm events (Photos 1, 2, 3).

The access road connecting ground water wells WR-385A and WR-385B with groundwater wells WR-448A and WR-448B is washed out and impassable due to storm run-off (Photo 4).

The remainder of the existing inspection roads on the property are generally in good condition.

Stormwater Controls
The rock spillways on the north side of the landfill are in good condition.

Stormwater Retention Basins
No stormwater retention basins are located on the landfill.

Landfill Earthen Cap
Significant erosion has occurred on the central landfill cap adjacent to the main rock spillway (Photos 5, 6, 7). Some exposed trash was observed in this erosion area. Areas of the south, west, and north boundary slopes of the landfill were also observed to be significantly eroded also. (Photos 8 through 12).

Landfill Gas Extraction System Wellfield
There is no landfill gas extraction system at the landfill.

Gas Extraction System Compound
There is no landfill gas extraction system at the landfill.

Landfill Gas Monitoring Wells
The landfill gas monitoring wells near the property appear to be in good condition.

Groundwater Monitoring Wells
The groundwater wells adjacent to the property appear to be in good condition.

Remediation Equipment
None.

Illegal Dumping
No illegal dumping was observed on the property.

Neighboring Land Uses
There have been no changes in land use of neighboring properties since the last inspection.

RECOMMENDED CORRECTIVE ACTIONS

- Erosion on the south perimeter access road should be repaired before the road becomes impassable.
- The washed out access connecting groundwater monitoring wells WR-385A and WR-385B with wells WR-448A and WR-448B should be repaired.
- The large rill adjacent to the rock spillway in the north central portion of the property should be repaired and the exposed trash covered.
- The erosion rills on the south, west, and north boundary slopes of the landfill should be repaired.

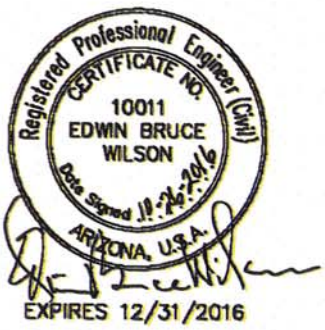
No other corrective actions are recommended at this time.

Should you have any questions or require additional information, please contact me at 520-321-4625 (office) or 520-488-9206 (cell).

Sincerely,

Kevin A. Pierce
Senior Manager Environmental

Attachments:
1: Landfill Inspection Table
2: Site Photographs



EXPIRES 12/31/2016

ATTACHMENT 1

LANDFILL INSPECTION TABLE

CITY OF TUCSON ENVIRONMENTAL SERVICES
ANNUAL CLOSED LANDFILL INSPECTION REPORT
TUMAMOC LANDFILL

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
Perimeter Security Fence and Gate (holes, structure issues)	None	
Inspection Roads (washouts, obstructions, potholes)	Significant erosion of south perimeter road. Well access road connecting groundwater monitoring wells WR-385A and WR-385B with wells WR-448A and WR-448B impassable due to erosion	Repair
Storm Water Controls (berms, let downs, spillways)	None	
Storm Water Retention Basins (washouts, excessive silt in, holding water)	N/A	
Landfill Earthen Cap (washouts, trash showing, debris and trash)	Large erosion rill adjacent to rock drainage, north central landfill cap, some trash exposed. Erosion of south, west, and north landfill boundary slopes	Repair
Landfill Gas Extraction System Wellfield (piping, wells, vaults, washouts)	N/A	
Landfill Gas Extraction System Compound (fencing, blower equipment, flare, carbon canisters)	N/A	
Landfill Gas Monitoring Wells (including bollards, vaults, locks)	N/A	
Groundwater Monitoring Wells (including bollards, vaults, locks)	None	
Remediation Equipment (compound fence, erosions, leaks)	N/A	
Illegal Dumping (including overgrown vegetation, homeless camps, vectors)	None	
Neighboring Land Uses (changing adjacent land uses that will or currently are impacting the landfill site)	None	
INSPECTOR SIGNATURE		**DATE: 10/6/2016**

ATTACHMENT 2

SITE PHOTOGRAPHS

Photo 1: Erosion on south perimeter road

Photo 2: Erosion on south perimeter road

Photo 3: Erosion on south perimeter road

Photo 4: Eroded road connecting wells WR-385A & WR-385B with wells WR-448A & WR-448B

Photo 5: Major erosion rilling adjacent to rock spillway, north central landfill cap

Photo 6: Erosion rilling adjacent to rock spillway, north central landfill cap, note exposed tire

Photo 7: Erosion rilling on north central landfill cap, note exposed pipe

Photo 8: Erosion rill on south slope of landfill

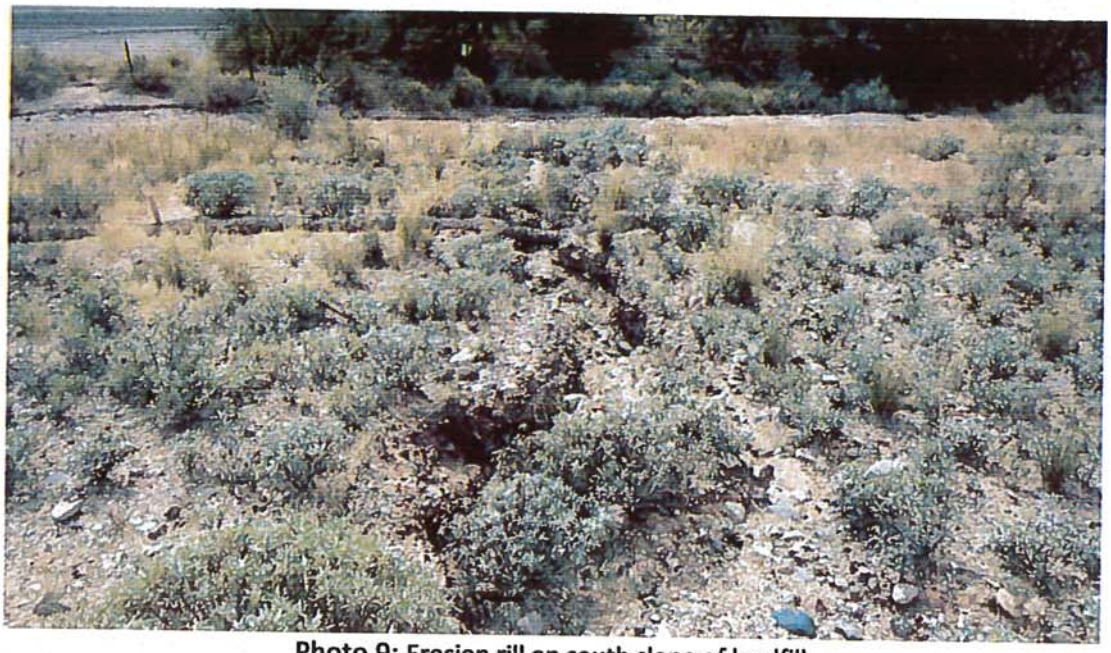


Photo 9: Erosion rill on south slope of landfill

Photo 10: Erosion rill on west slope of landfill

Photo 11: Erosion rill on north slope of landfill

Photo 12: Erosion rill on south slope of landfill