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April 7, 2015

Mr. Ron Ellis, MC 160
Texas Commission on Environmental Quality
Manager, Water Rights Permitting and Availability Section
P.O. Box 13087
Austin, TX 78711-3087

RE: Application to Amend Water Use Permit No. 5383A (the "Permit"); Additional Information

Dear Mr. Ellis:

On behalf of the Town of Addison ("Town"), please find enclosed additional information in support of the amendment application for the Permit referenced above. This additional information includes the following:

1. Authorization for Signing the Amendment Application

Located in Attachment A is the resolution from the Town authorizing the City Manager to sign the amendment application.

2. 24-Hour Pump Test

Included in Attachment B is the 24-hour pump test conducted by C. Miller Drilling on May 1 and 2, 2013. Included with the pump test data is an analysis provided to the Town by the City of Farmers Branch. The well analysis concludes that the Town's well "should easily be capable of providing the required quantity of water to offset the calculated evaporation from the Vitruvian Park complex."

3. Water Quality Information

On March 17, 2015, the Town took water samples from the well and Farmers Branch Creek (both upstream and downstream of the Vitruvian Park development). The results of the water analysis are summarized in Table 1 below. Copies of the water quality results for the well and the creek are located in Attachment C.

Table 1: Water Quality Results of Well and Farmers Branch Creek

Parameter	WQ Standard for Stream Segment 0822	Sampling Results in mg/L		
		Water Well	Upstream Location	Downstream Location
TDS	500	**2100**	**550**	436
Chlorides	80	**373**	66.3	56
Sulfates	60	**489.5**	**126.7**	**92.9**
pH	6.5-9.0	7.69	8.11	7.61
Temp.	90°F	82°F	70.5°F	67.5°F

* Bold values are above water quality standards for Stream Segment 0822.

The sampling results in Table 1 indicate that the water quality of the well is not having a negative impact on Farmers Branch Creek. The upstream sampling result shows an exceedance for both TDS and sulfates. However, the downstream sampling result shows an improvement in all of the water quality parameters tested. The sulfate concentration in the downstream sample still exceeds the standard of 60 mg/L. However, the sulfate concentration improved from 126.7 mg/L to 92.9 mg/L. This improvement in the water quality for Farmers Branch Creek is consistent with previous water quality samples taken by the City of Farmers Branch and TCEQ Region 4. In each instance, the water quality parameters showed a marked improvement after leaving the Vitruvian Park development. Table 2 below summarizes the results of the water sampling events at Farmers Branch Creek that included an upstream and downstream sample.

Table 2: Water Quality Comparison*

Para.	WQS	Sampling Results in mg/L					
Date	***	Sample Taken by the City of Farmers Branch 05/21/2014		Sample Taken by TCEQ Region 4 10/08/2014		Sample Taken by the Town of Addison 03/17/2015	
		Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
TDS	500	361	303	246	134	**550**	436
Chlorides	80	35.2	28.4	22.8	14	66.3	56
Sulfates	60	**81.3**	58.2	24.3	13.3	**126.7**	**92.9**
pH	6.5-9.0	N/A	N/A	N/A	N/A	8.11	7.61
Temp.	90°F	N/A	N/A	N/A	N/A	70.5°F	67.5°F

* Bold values are above water quality standards for Stream Segment 0822.

As indicated in the table above, all downstream samples showed an improvement in water quality. As a consequence, the use of the Woodbine Aquifer will not result in an adverse impact to other water right holders or the environment.

The Town is still working on a proposed accounting plan and will provide that to you soon. Please let us know if you have any questions.

Attachment A

TOWN OF ADDISON, TEXAS

RESOLUTION NO. R15- 005

A RESOLUTION OF THE CITY COUNCIL OF THE TOWN OF ADDISON, TEXAS CONFIRMING AND RATIFYING THE EXECUTION BY THE CITY MANAGER OF AN AMENDMENT APPLICATION TO WATER USE PERMIT NO. 5383A FILED WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY IN FEBRUARY, 2015; PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Town of Addison, Texas (the "City") is in the process of amending its Water Use Permit No. 5383A (the "Application", a copy of which without attachments is attached hereto as Exhibit A) with the Texas Commission on Environmental Quality ("TCEQ");

WHEREAS, the rules of the TCEQ (30 Tex. Admin. Code §295.14(5)) require that the Application be signed by a duly authorized official;

WHEREAS, the City Manager, Lea Dunn, signed the Application on behalf of the City; and

WHEREAS, the City Council desires by this Resolution to confirm the authority of the City Manager to sign the Application on behalf of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE TOWN OF ADDISON, TEXAS:

Section 1. The above and foregoing recitals to this Resolution are true and correct and are incorporated herein and made a part hereof for all purposes.

Section 2. The City Council hereby acknowledges the filing of the Application with the TCEQ and the execution of that application by the City Manager, Lea Dunn. The City Council does hereby confirm the authority of the City Manager to execute the Application on behalf of the City, and does hereby ratify her execution of that Application.

Section 3. This Resolution shall take effect upon its passage and approval.

PASSED AND APPROVED by the City Council of the Town of Addison, Texas this the 10th day of March, 2015.

Todd Meier, Mayor

ATTEST:

By: Chelsea Gonzalez, City Secretary

APPROVED AS TO FORM:

By: Brenda McDonald, City Attorney

EXHIBIT A
TO RESOLUTION NO. R15-005

[Attach copy of Application for Amendment to Water Use Permit No. 5383A w/out attachments]

Attachment B

Draw Down Data and Production Report

Client: City of Addison
Static Level: 315' 1"
Max S.F:
HP: 5 HP
Volts: 230 V 1 Ph

Pump End: Schaefer 35LD
Pipe Size: 1.5" Galv
Location: Intruvint Well
Date: May 1st + 2nd 2013
Rcrd By: Scott + Davion

Time	GPM	Water Level	AMP	Volts
10:30 PM	37	315' 1"	yellow	237
10:45	36	336' 0"	stayed between	235
11:00	36	336' 4"	25-26	235
11:15	36	336' 5"		235
11:30	36	336' 9"	Red	235
Midnight	36	337' 1"	stayed between	235
12:30 AM	36	337' 3"	10-11	235
1:00	36	337' 8"		235
1:30	37	337' 9"	Black	235
2:00	36	338' 0"	stayed between	234
2:30	36	338' 4"	16-17	235
3:00	36	338' 6"		235
3:30	36	338' 7"		235
4:30	37	338' 9"		238
5:30	37	339' 2"		238
6:30	37	339' 4"		239
7:30	36	339' 4"		239
8:30	36	339' 8"		239
9:30	37	339' 9"		239
10:30	37	340' 0"		239
11:30	36	340' 2"		239
12:30	36	340' 3"		239
1:30 PM	37	340' 3"		239
2:30	36	340' 5"		239
3:30	36	340' 6"		239
4:30 PM	36	340' 7"		238

Draw Down Data and Production Report

Client: City of Atchison
Static Level: 315' 1"
Max S.F.:
HP: 5 HP
Volts: 230 V 1 Ph

Pump End: 35 LD
Pipe Size: 1.5" Galv.
Location: Utrecht Well
Date: 5 - 1st + 2nd - 2013
Rcrd By: Scott + Davion

Time	GPM	Water Level	AMP	Volts
5:30 PM	36	340' 7"		239
6:30	36	340' 8"		240
7:30	37	340' 9"		240
8:30	36	341' 0"		240
9:30	36	341' 1"		240
10:30 PM	36	341' 1"		240
	Recovery			
10:30 P	36	341' 1"		
10:30 P	Ø	341' 1"		
10:45		320' 6"		
11:00		320' 2"		
11:15		319' 7"		
11:30 P		319' 6"		

C. Miller Drilling

Pump Set and New Well Completion

Name of Owner: City of Addison Date Set: 5 / 1 / 13

Address: Vitruvian well City: Addison Texas

Well Information:

Surface Completion: _____ Slab ✓ Sleeve Pipe Sleeve Pipe Size: _____

Static Level of Water: 315' 1" Jetting Info: _____@_____ _____@_____

Pump Set Information:

Horsepower Rating: 5HP

Pump Make and Model: Schaefer 35LD5S4 Pump Serial Number: 12J22

Motor Make and Model: Franklin 5HP 230V 1Ph Motor Serial Number: 12H14

Well Depth: _____ Pump Setting: 483' Wire Size: #6-3 w.grd

Hangpipe: _____SCH 80 PVC _____ Coil Pipe ✓ Galv Pipe Size of Pipe 1.5"

Tank (s): _____Air Volume _____ Bladder Number of Tanks: _____ Size: _____ Gal.

Installer: Scott Helper: Devion

Other Information:

upgrade from 2HP to 5HP 35 GPM
Checkvalves 4+8 Joints up (per chris Miller)
23 Joints of 1.5 Galv.

Well/Aquifer Yield Analysis

1. Introduction

The objective of this analysis is to review available data regarding the existing well, other wells in the area, and the Woodbine Aquifer and use those data to determine if the existing Vitruvian Park make-up water well can meet the water quantity requirements to maintain the flows in the creek. The data and information reviewed in this section include well construction information, static water level data from the well, time-drawdown data from pumping tests performed in the well, and long-term drawdown projections from the current Texas Water Development Board (TWDB) Groundwater Availability Model (GAM) for the Northern Trinity/Woodbine Aquifer system.

2. Hydrogeologic Setting

The well is completed in the confined portion of the Woodbine Aquifer (Figure 1) with an open interval from 580 to 632 feet below ground surface (bgs). The Woodbine Aquifer, classified as a minor aquifer by the TWDB, directly overlies the Trinity Aquifer and consists of Cretaceous sandstone interbedded with shale and clay that form three distinct water-bearing zones (George and others, 2011). Deeper zones within the aquifer typically yield the most water to wells, whereas wells in the shallower zones generally exhibit limited well yields and poorer water quality (George and others, 2011).

Two static water level measurements are available for the Vitruvian well. These measurements are 315.1 feet bgs, taken on 1 May 2013, and 306.6 feet bgs, taken on an unknown date. Assuming that these are typical measurements for the static water level in the well, the available artesian head above the top of the Woodbine Aquifer (580 feet bgs) is about 265 to 273 feet.

Potential long-term water level trends in the Woodbine Aquifer at Vitruvian Park were evaluated by reviewing the results of predictive model runs performed by Harden & Associates using the Northern Trinity/Woodbine Aquifer GAM (Harden & Associates, 2004). Model-predicted drawdowns from year 2000 to year 2050 (Figure 2) suggest an overall trend of rising water levels in the Woodbine at Vitruvian Park with an increase of about 50 feet over the predictive period. This increase in water levels is attributed to a projected decrease in demand on the aquifer in this region, with an increased reliance on surface water sources. Based on this, it is assumed that there will be no long-term regional water level drawdowns in the Woodbine that could limit availability of water in the Vitruvian well; therefore, the yield analysis presented in this report only considers the effects of the Vitruvian well alone and does not consider regional impacts on the well.

3. Well Yield Analysis

The capability of the Vitruvian Park well to supply the required flow rates to maintain flow in the creek was evaluated using an analytical model that calculates drawdown (i.e., water level change) in a confined aquifer in response to constant pumping from a single well. The following section describes the model, presents the methods used to determine the input parameters for the model, and presents and discusses the model results.

3.1 Analytical Model Description

The analytical model is based on the Theis equation for non-steady state flow in an isotropic, homogeneous confined aquifer (Theis, 1935). The Theis equation is

$$s = \frac{Q}{4\pi T} W(u) \qquad \text{Eqn. 1}$$

where:

$$u = \frac{r^2 S}{4Tt} \qquad \text{Eqn. 2}$$

and

$$W(u) = \int_u^{\infty} \frac{e^{-u} du}{u} \qquad \text{Eqn. 3}$$

and:

s = drawdown [L], defined as the initial head minus the head at time [t]
r = radial distance from pumping well [L]
T = aquifer transmissivity [L^2/t]
S = aquifer storativity [-]
t = time after the start of pumping [t]
Q = pumping rate from the well [L^3/t]

The model was developed in a Microsoft Excel workbook.

3.2 Justification for Model Input Parameters

The edge of the borehole in the Vitruvian Park well was assigned to the radial distance from the pumping well (r). Assuming an 8.5 inch diameter borehole (as indicated on the electric log for the well), a radius of 4.25 inches (0.3542 feet) was used in all simulations.

Transmissivity of the formation (T) was estimated by analyzing time-drawdown data from two pumping tests performed on the Vitruvian Park well. A discussion of the analysis of the pumping test data is presented in the following section.

Storativity of the formation (S) was estimated by calibrating the Theis analytical model to the drawdown data using the range of transmissivity values determined by the analysis of the time-drawdown data. Details of the model calibration are provided in the following section.

3.3 Analysis of Pumping Test Data and Model Calibration

Time drawdown data from two pumping tests performed on the Vitruvian Park well were analyzed using a combination of direct test analysis and calibration of the analytical model. Test 1 was performed on an unknown date at a constant rate of 16 gpm for 8.3 hours, with one hour of recovery time monitored. Test 2 was performed on 1-2 May 2014 at a pumping rate of 36-37 gpm for 24 hours with one hour of recovery time monitored. All time-drawdown data are presented in Table 1. Graphs showing drawdown and recovery data are presented as Figures 3 and 4.

Data Quality

The drawdown data for Test 1 fall on a relatively straight line on a semi-log plot of time versus drawdown (Figure 3a), indicating that the measured drawdown response is representative of the drawdowns in the formation. The pattern of the drawdown and recovery data for this test (Figure 3b) follow the patterns predicted by a model simulation, which also indicate that the response is representative of the formation response. The recovery data are somewhat limited, because at the end of the recovery period the well was still at over 10% of the maximum drawdown; however, there is enough data to match the response to a modeled response curve. These observations indicate that the drawdown and recovery data from Test 1 are good quality and suitable for analysis.

The drawdown data for Test 2 deviate somewhat from a straight line on a semi-log plot of time versus drawdown (Figure 4a). This deviation is possibly related to variations in the pumping rate that were not observed due to lack of precision in pump rate measurements. Deviations could also be caused by inefficiency

in the well, which increases with increasing pumping rates; however, inefficiency usually results in a positive deviation (i.e., greater drawdown than predicted) rather than the negative deviation observed in Figures 4a and 4b. In addition, the recovery data is limited; specifically, the drawdown at the end of the recovery period is still about 17% of the maximum drawdown and the recovery curve is too short to match to a modeled response curve. The data from Test 2 are still useable, and they were analyzed; however, the quality of the data is not as good as that for Test 1.

Pumping Test Analysis Methods

The drawdown data from each test were analyzed using the Cooper-Jacob method (Cooper and Jacob, 1946). The recovery data from each test were analyzed using the Cooper-Jacob recovery method (Cooper and Jacob, 1946). The analyses were performed using a set of MS Excel spreadsheets developed by the U.S. Geological Survey for analyzing aquifer test data (Halford and Kuniansky, 2002). Printouts of the data analysis sheets are presented in Attachment A.

The results are presented in parts A and B of Table 2. The calculated transmissivities range from 430 - 640 ft^2/d. The test with the higher pump rate resulted in lower T values, which is consistent with well inefficiency issues. Assuming a saturated thickness of 52 feet, corresponding to the length of the screened interval, the calculated hydraulic conductivities range from 8.3 - 12.3 ft/d. These values are on the high side of values expected for consolidated sandstone like the formation that contains the Woodbine, but are not unreasonable values.

Model Calibration

The Cooper-Jacob analysis method applied to a single well with no observation wells do not provide a direct estimate of storativity in the formation. To estimate the storativity, a Theis model was constructed and used to calibrate the model parameters to the actual pumping and recovery data from pumping test 1. Transmissivity values within the range provided by the analysis were applied to the model and the storativity values were varied iteratively to achieve the best fit to the data. The resulting model with the best fit, which is included as the red line on Figures 3 and 4, has a transmissivity of 510 ft^2/d and a storativity of 0.0004, both of which are reasonable values for a confined sandstone aquifer like the Woodbine. These values were used in the predictive models discussed in the next section.

3.4 Predictive Model Results and Yield Estimation

The evaporation analysis for Vitruvian Park indicates that the make-up water well needs to be able to supply a constant 9.3 gpm from the well over the long term, with a historical monthly maximum of 22.2 gpm. These pumping rates were applied to the analytical model, and drawdowns within the well were calculated at 1 year of constant pumping. Model results for pumping at 9.3 gpm are presented in Figure 5. Model results for pumping at 22.2 gpm are presented in Figure 6.

Pumping at the required long-term rate of 9.3 gpm results in less than 8.5 feet of drawdown in the pumping well after one year of constant pumping. Pumping at the maximum monthly rate of 22.2 gpm results in 18.4 feet of drawdown at the end of one month and about 20 feet of drawdown after a full year. Pumping from the well at the maximum monthly rate for an additional 50 years would only add an additional 2-3 feet of drawdown to the well.

4. Conclusions

As stated in Section 2, the available drawdown in the well is about 265 to 273 feet. Based on the model results presented here, pumping from the well at a constant 22.2 gpm for 50 years, which is much greater that the assumed maximum rate needed, would result in less than a 9% reduction in the available artesian head. These

calculations indicate that the well should easily be capable of providing the required quantity of water to offset the calculated evaporation from the Vitruvian Park complex.

Tables

Table 1. Time-Drawdowns Data for the Vitruvian Water Well

A. TEST 1 (DATE UNKNOWN)

Time of Day	Elapsed Time min	Elapsed Time hrs	Pump Rate gpm	Depth to Water ft bgs	Draw-down ft
9:00 AM	0	0.0		306.6	0.00
9:15 AM	15	0.3	16	316.3	9.67
9:30 AM	30	0.5	16	316.4	9.83
9:45 AM	45	0.8	16	316.6	10.00
10:00 AM	60	1.0	16	316.7	10.08
10:15 AM	75	1.2	16	316.8	10.17
10:30 AM	90	1.5	16	316.9	10.33
10:45 AM	105	1.8	16	317.0	10.38
11:00 AM	120	2.0	16	317.0	10.42
11:15 AM	135	2.3	16	317.1	10.50
11:45 AM	165	2.8	16	317.1	10.54
12:15 PM	195	3.3	16	317.2	10.63
12:45 PM	225	3.8	16	317.3	10.71
1:15 PM	255	4.3	16	317.3	10.71
2:15 PM	315	5.3	16	317.4	10.79
3:15 PM	375	6.3	16	317.5	10.92
4:15 PM	435	7.3	16	317.6	11.00
5:15 PM	495	8.3	16	317.6	11.04
5:20 PM	500	8.3		308.7	2.13
5:25 PM	505	8.4		308.5	1.88
5:30 PM	510	8.5		308.3	1.67
5:35 PM	515	8.6		308.3	1.67
5:40 PM	520	8.7		308.2	1.63
5:45 PM	525	8.8		308.0	1.42
6:00 PM	540	9.0		307.9	1.33
6:15 PM	555	9.3		307.8	1.25

B. TEST 2 (1-2 MAY 2014)

Time of Day	Elapsed Time min	Elapsed Time hrs	Pump Rate gpm	Depth to Water ft bgs	Draw-down ft
10:15 PM	0	0.0		315.1	0.00
10:30 PM	0	0.0	37	315.1	0.00
10:45 PM	15	0.2	36	336.0	20.92
11:00 PM	30	0.5	36	336.3	21.25
11:15 PM	45	0.8	36	336.4	21.33
11:30 PM	60	1.0	36	336.8	21.67
12:00 AM	90	1.5	36	337.1	22.00
12:30 AM	120	2.0	36	337.3	22.17
1:00 AM	150	2.5	36	337.7	22.58
1:30 AM	180	3.0	37	337.8	22.67
2:00 AM	210	3.5	36	338.0	22.92
2:30 AM	240	4.0	36	338.3	23.25
3:00 AM	270	4.5	36	338.5	23.42
3:30 AM	300	5.0	36	338.6	23.50
4:30 AM	360	6.0	37	338.8	23.67
5:30 AM	420	7.0	37	339.2	24.08
6:30 AM	480	8.0	37	339.3	24.25
7:30 AM	540	9.0	36	339.3	24.25
8:30 AM	600	10.	36	339.7	24.58
9:30 AM	660	11.	37	339.8	24.67
10:30 AM	720	12.	37	340.0	24.92
11:30 AM	780	13.	36	340.2	25.08
12:30 PM	840	14.	36	340.3	25.17
1:30 PM	900	15.	37	340.3	25.17
2:30 PM	960	16.	36	340.4	25.33
3:30 PM	102	17.	36	340.5	25.42
4:30 PM	108	18.	36	340.6	25.50
5:30 PM	114	19.	36	340.6	25.50
6:30 PM	120	20.	36	340.7	25.58
7:30 PM	126	21.	37	340.8	25.67
8:30 PM	132	22.	36	341.0	25.92
9:30 PM	138	23.	36	341.1	26.00
10:30 PM	144	24.	36	341.1	26.00
10:45 PM	145	24.		320.5	5.42
11:00 PM	147	24.		320.2	5.08
11:15 PM	148	24.		319.6	4.50
11:30 PM	150	25.		319.5	4.42

Table 2. Summary of Results of Hydraulic Parameter Estimations for Model Input

Test Phase	Trans-missivty ft^2/d	[1]Hydraulic Conductivity ft/d	Storativity -
A. [2]Analysis of Test 1			
Drawdown	570	11.0	n/a
Recovery	640	12.3	n/a
B. [2]Analysis of Test 2			
Drawdown	430	8.3	n/a
Recovery	580	11.2	n/a
C. [3]Model Calibration			
Both	510	9.8	0.0004

Notes:
1. Assuming saturated thickness (i.e., length of well screen) = 52 ft
2. Analysis of drawdown and recovery data using the Cooper-Jacob (1946) methods
3. Calibration of Theis (1935) solution to all test data assuming an ~8.5 inch diameter borehole (r = 0.3542 ft)

Figures

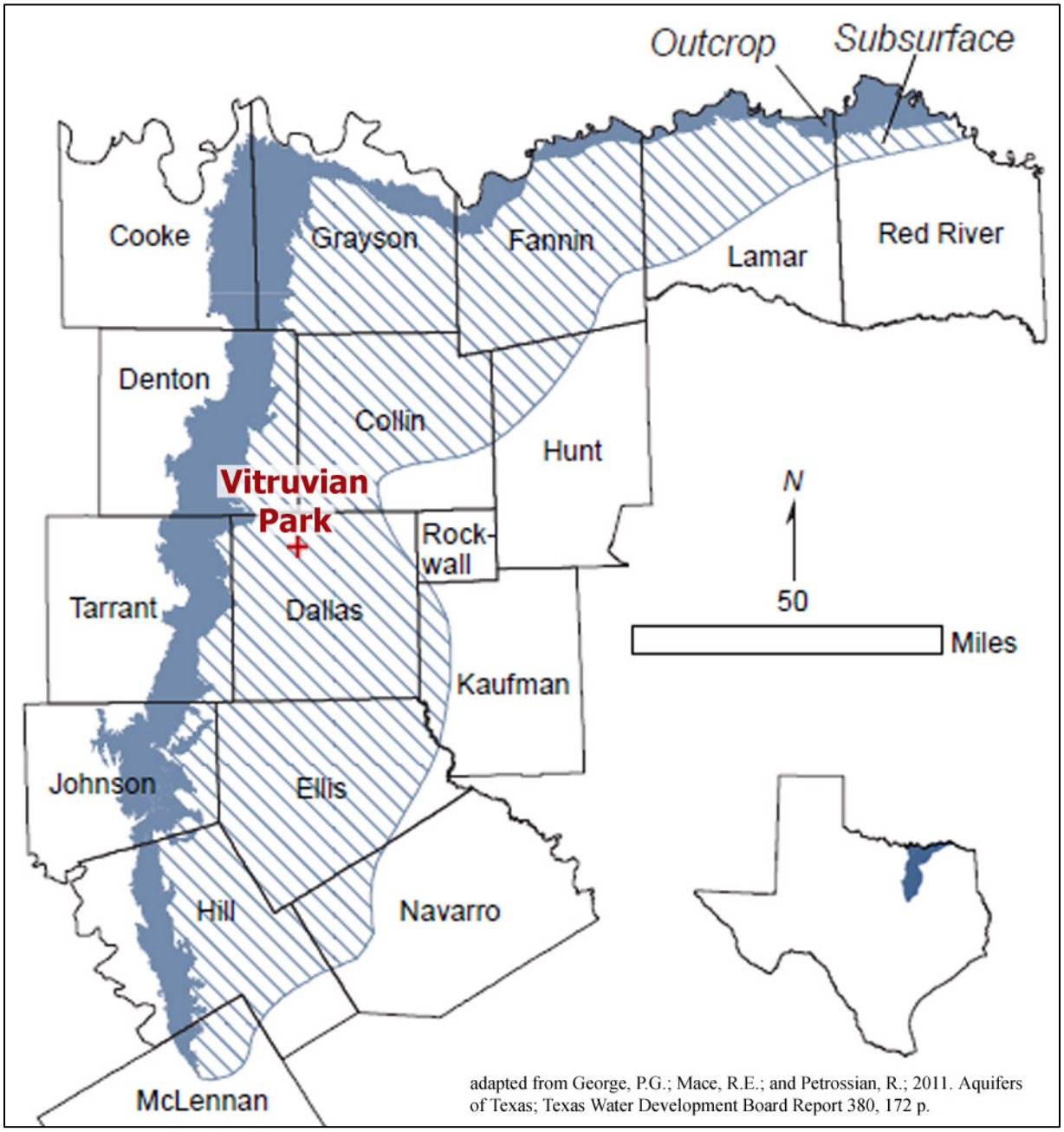


Figure 1. Map of the Woodbine Aquifer Showing the Location of the Vitruvian Park Well

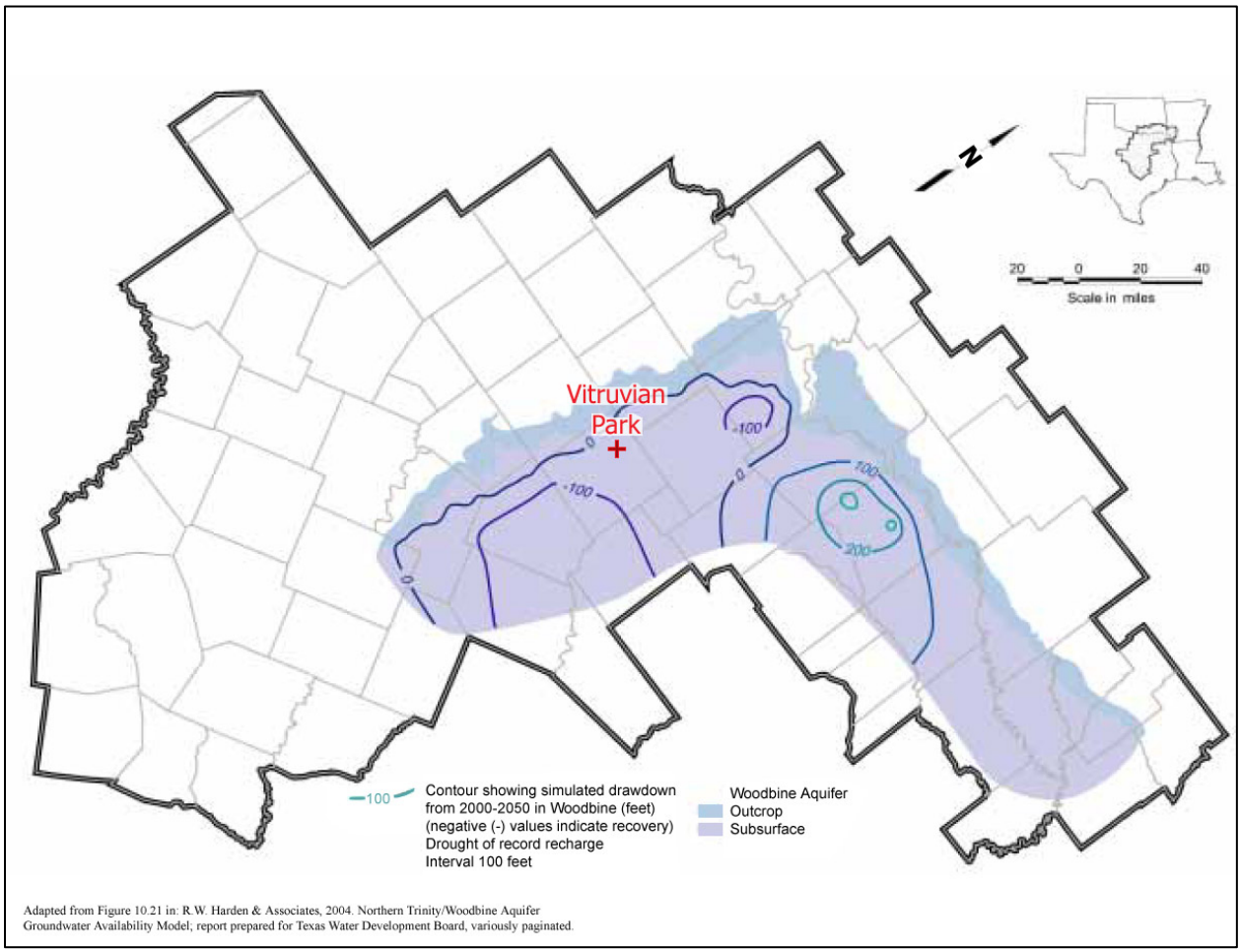


Figure 2. GAM Simulated Water Level Change for the Woodbine Aquifer from 2000 to 2050

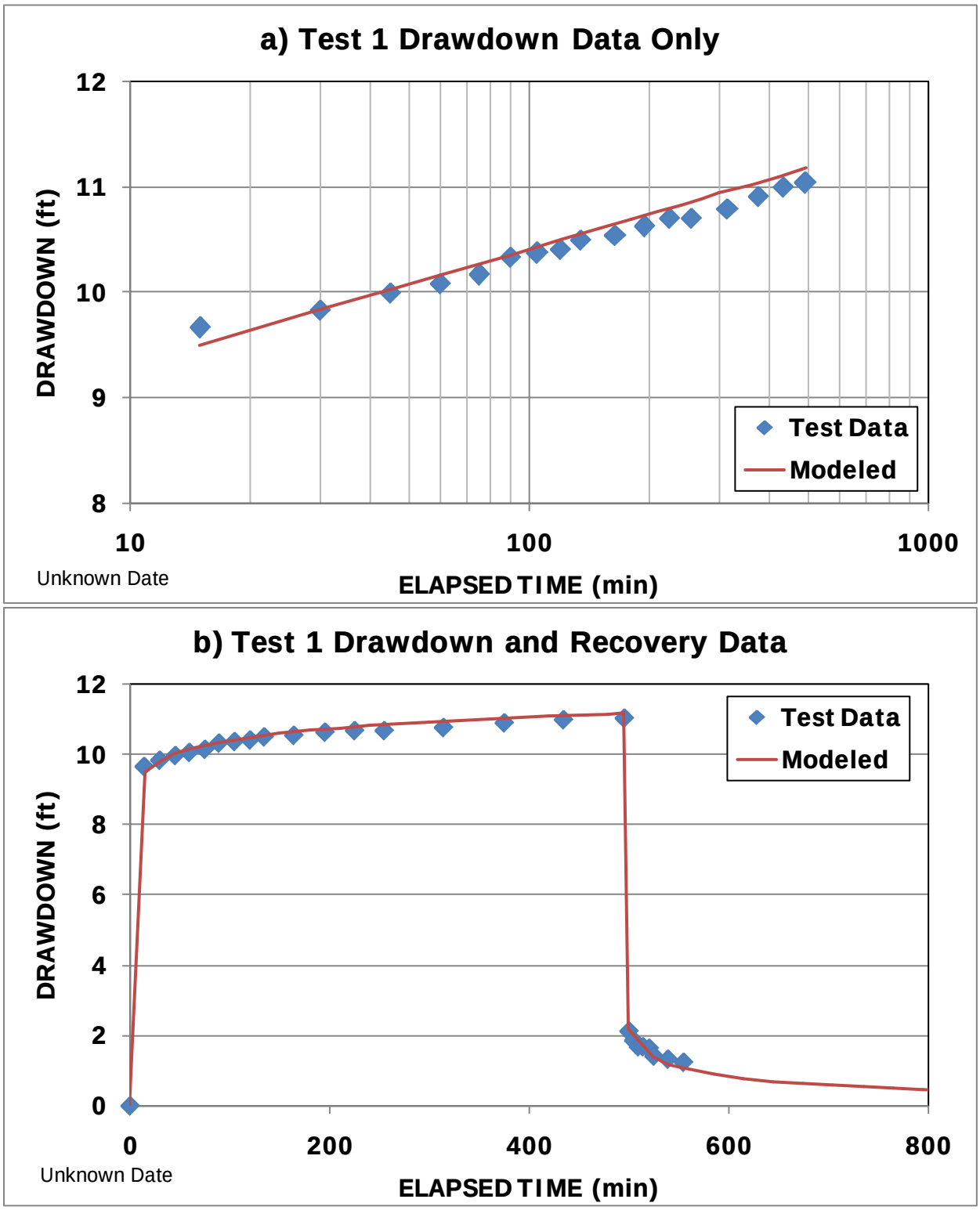
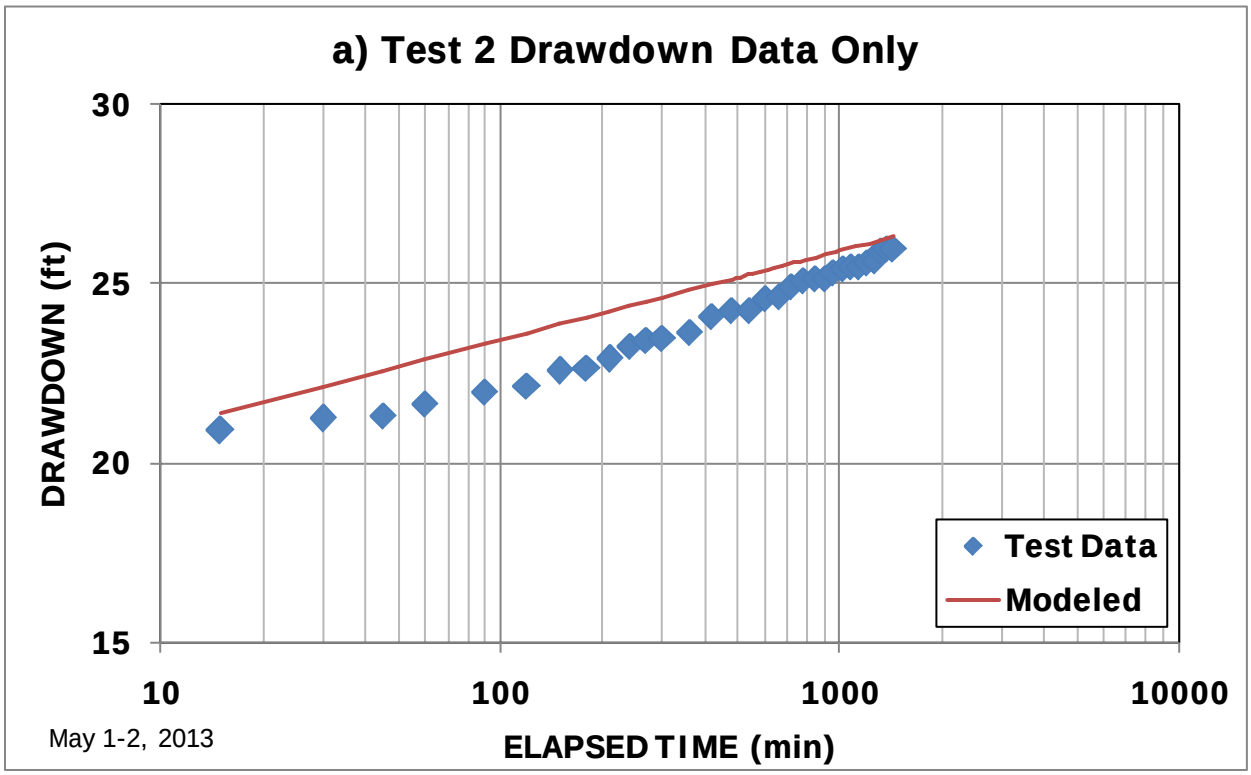


Figure 3. Pumping Test Data (blue diamonds) for Test 1.

Graph a) shows drawdown data only on a semi-logarithmic scale. Graph b) shows drawdown and recovery data on an arithmetic scale. The red lines show the final calibration model results.



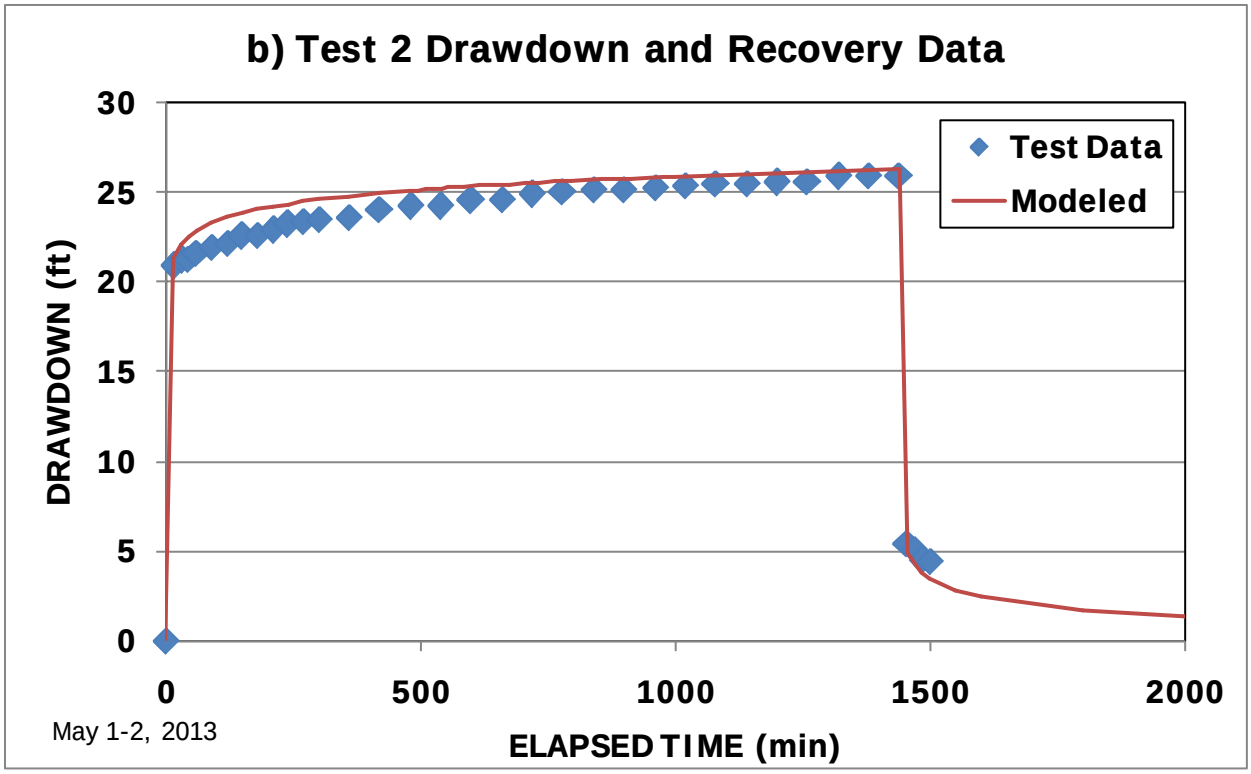


Figure 4. Pumping Test Data (blue diamonds) for Test 2.

Graph a) shows drawdown data only on a semi-logarithmic scale. Graph b) shows drawdown and recovery data on an arithmetic scale. The red lines show the final calibration model results.

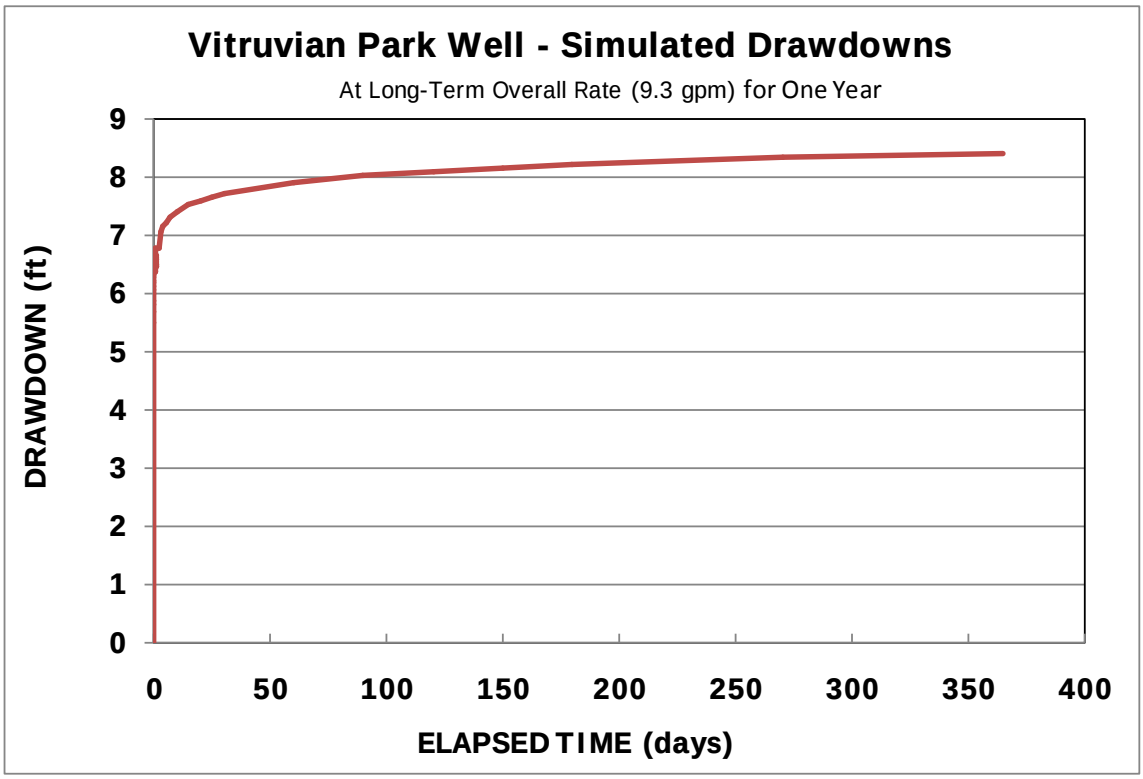


Figure 5. Model Results for Continuous Pumping at the Long-Term Required Rate (9.3 gpm)

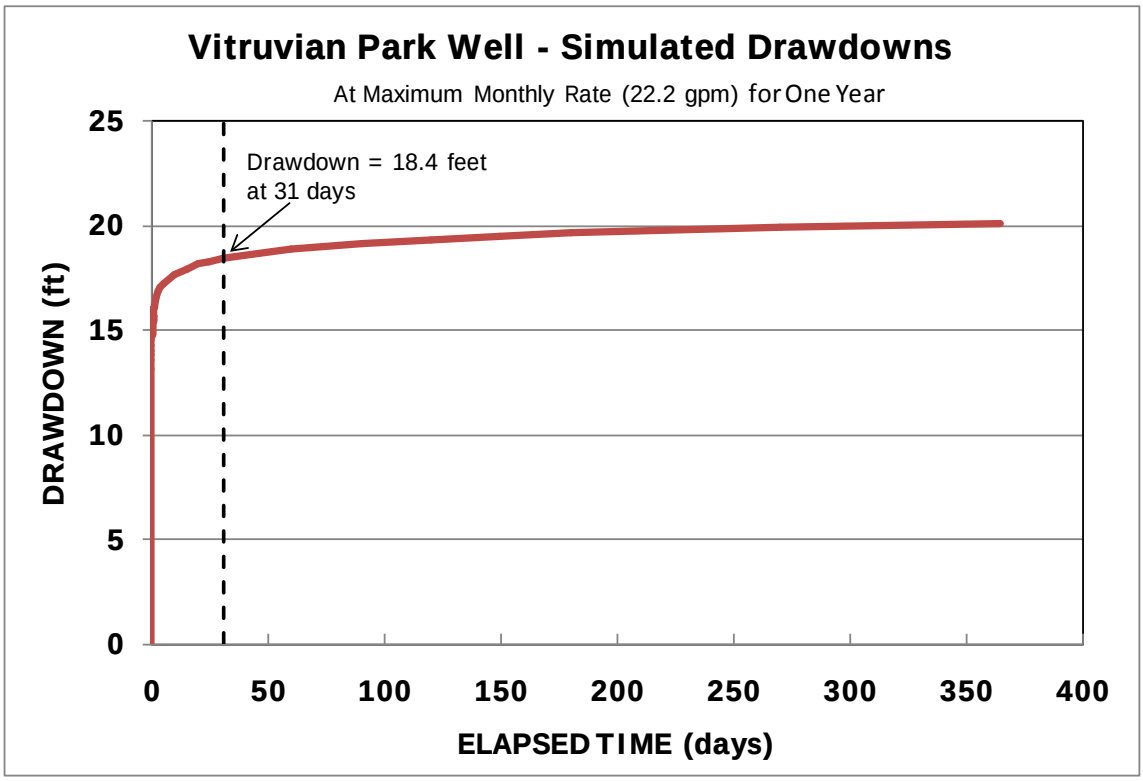


Figure 6. Model Results for Continuous Pumping at the Maximum Monthly Rate (22.2 gpm)

References

Cooper, H.H. and Jacob, C.E., 1946. A generalized graphical method for evaluating formation constants and summarizing well field history; *Trans. American Geophysical Union*, v. 27, 526–534.

George, P.G.; Mace, R.E.; and Petrossian, R.; 2011. Aquifers of Texas; Texas Water Development Board Report 380, 172 p.

Halford, K.J. and Kuniansky, E.L., 2002. Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data; USGS Open-File Report 02-197, 51 p.

R.W. Harden & Associates, 2004. Northern Trinity/Woodbine Aquifer Groundwater Availability Model; report prepared for Texas Water Development Board, variously paginated.

Theis, C.V., 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground water storage; *Trans. American Geophysical Union*, v. 16, 519–524 p.

Attachment A to Appendix C

Data Analysis Sheets

WELL ID: Vitruvian Park Supply Well

Local ID: City of Addison
Date: unknown
Time: 0:00

INPUT

Construction:		
Casing dia. (d_c)	4	Inch
Annulus dia. (d_w)	8	Inch
Screen Length (L)	52	Feet
Depths to:		
water level (DTW)	306.6	Feet
Top of Aquifer	580	Feet
Base of Aquifer	632	Feet
Annular Fill:		
across screen --	Medium Sand	
above screen --	Cement	
Aquifer Material --	Medium-Grained Sand	
FLOW RATE	16	GPM

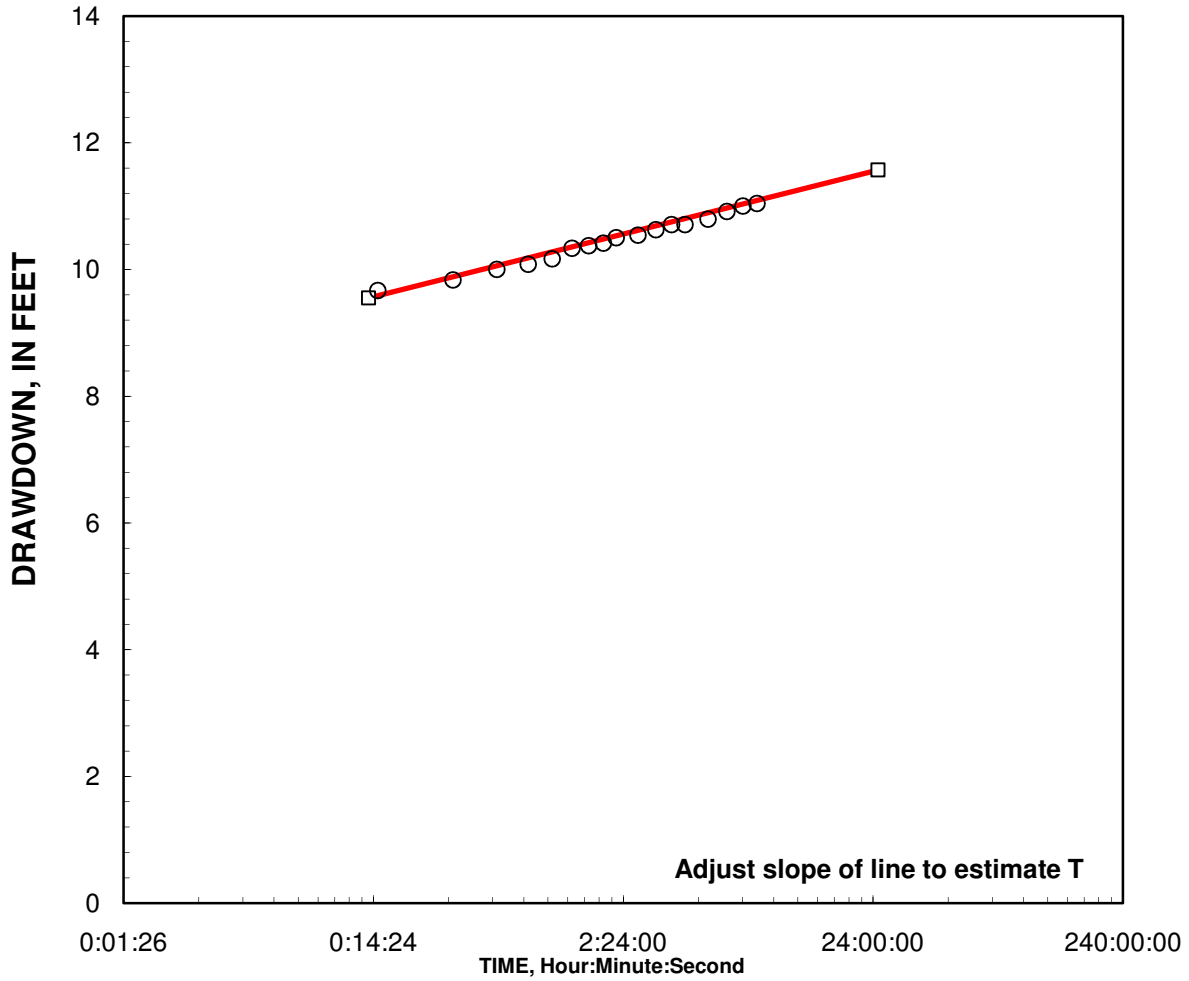
COMPUTED

Aquifer thickness = 52 Feet

Slope = 0.990196 Feet/log10

Input is consistent.

K = 11.0 Feet/Day
T = 570 Feet²/Day



REMARKS: Cooper-Jacob analysis of single-well aquifer test

WELL ID: Vitruvian Park Supply Well

Local ID: City of Addison
Date: unknown
Time: 0:00

INPUT

Construction:		
Casing dia. (d_c)	4	Inch
Annulus dia. (d_w)	8	Inch
Screen Length (L)	52	Feet
Depths to:		
water level (DTW)	306.6	Feet
Top of Aquifer	580	Feet
Base of Aquifer	632	Feet
Annular Fill:		
across screen --	Medium Sand	
above screen --	Cement	
Aquifer Material --	Medium-Grained Sands	
FLOW RATE	16	GPM

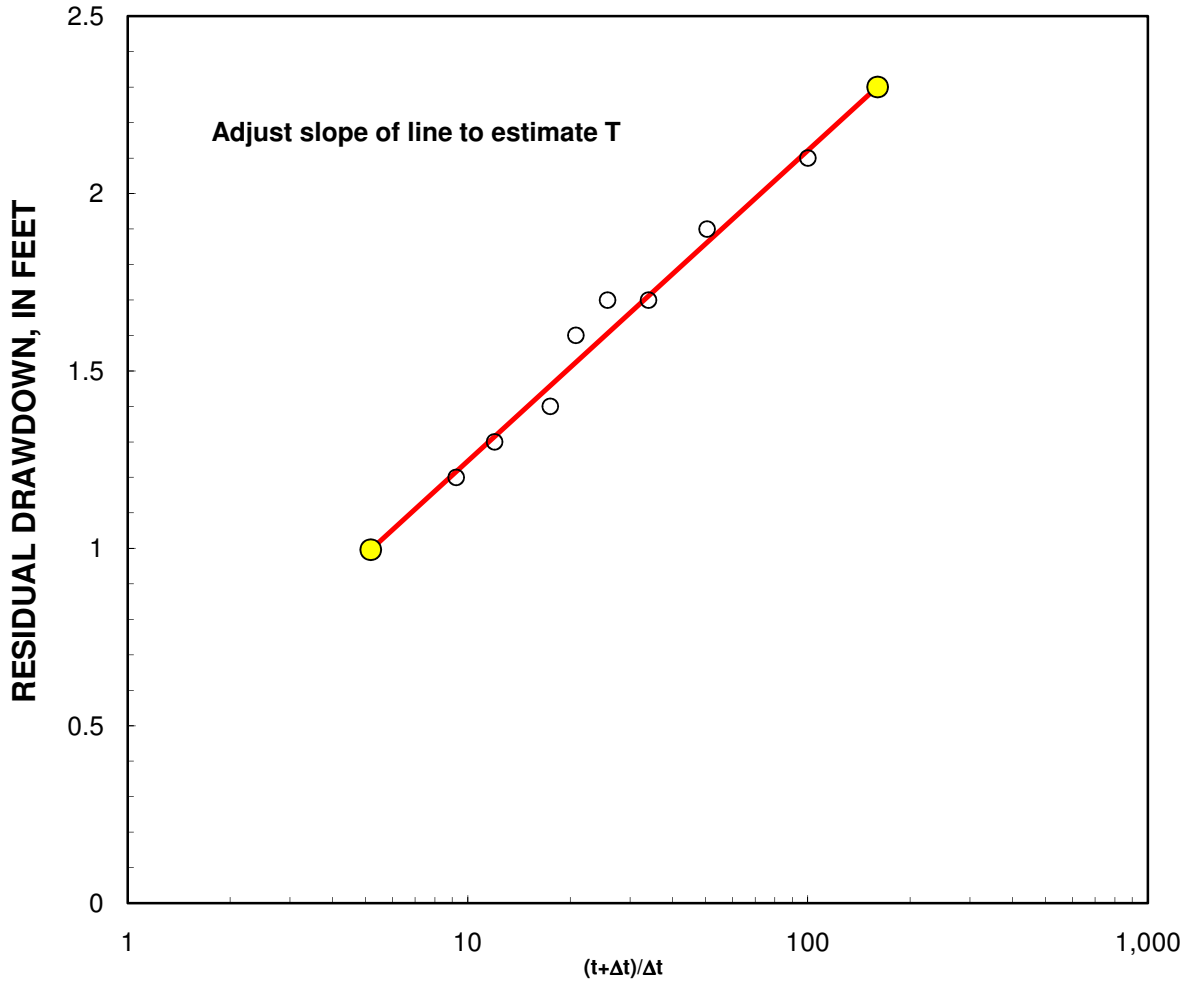
COMPUTED

Aquifer thickness = 52 Feet

Slope = 0.875168 Feet/log10

Input is consistent.

K = 12 Feet/Day
T = 640 Feet²/Day



REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

WELL ID: Vitruvian Park Supply Well

Local ID: City of Addison
Date: 5/1/2013
Time: 0:00

INPUT

Construction:		
Casing dia. (d_c)	4	Inch
Annulus dia. (d_w)	8	Inch
Screen Length (L)	52	Feet
Depths to:		
water level (DTW)	315.1	Feet
Top of Aquifer	580	Feet
Base of Aquifer	632	Feet
Annular Fill:		
across screen --	Medium Sand	
above screen --	Cement	
Aquifer Material --	Medium-Grained Sand	
FLOW RATE	36	GPM

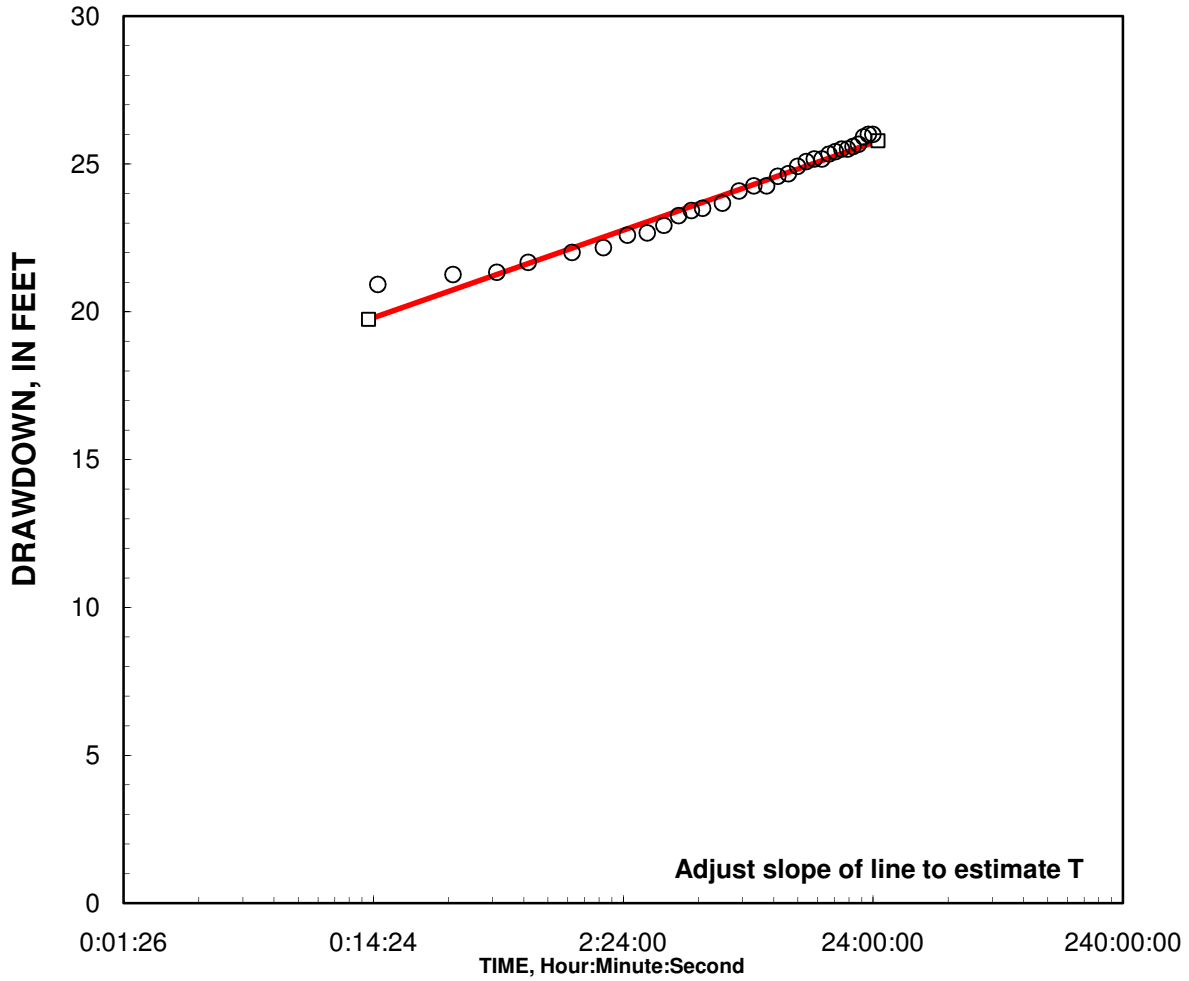
COMPUTED

Aquifer thickness = 52 Feet

Slope = 2.960784 Feet/log10

Input is consistent.

K = 8.2 Feet/Day
T = 430 Feet²/Day



REMARKS: Cooper-Jacob analysis of single-well aquifer test

WELL ID: Vitruvian Park Supply Well

Local ID: City of Addison
Date: 5/2/2013
Time: 0:00

INPUT

Construction:		
Casing dia. (d_c)	4	Inch
Annulus dia. (d_w)	8	Inch
Screen Length (L)	52	Feet
Depths to:		
water level (DTW)	306.6	Feet
Top of Aquifer	580	Feet
Base of Aquifer	632	Feet
Annular Fill:		
across screen --	Medium Sand	
above screen --	Cement	
Aquifer Material --	Medium-Grained Sands	
FLOW RATE	36	GPM

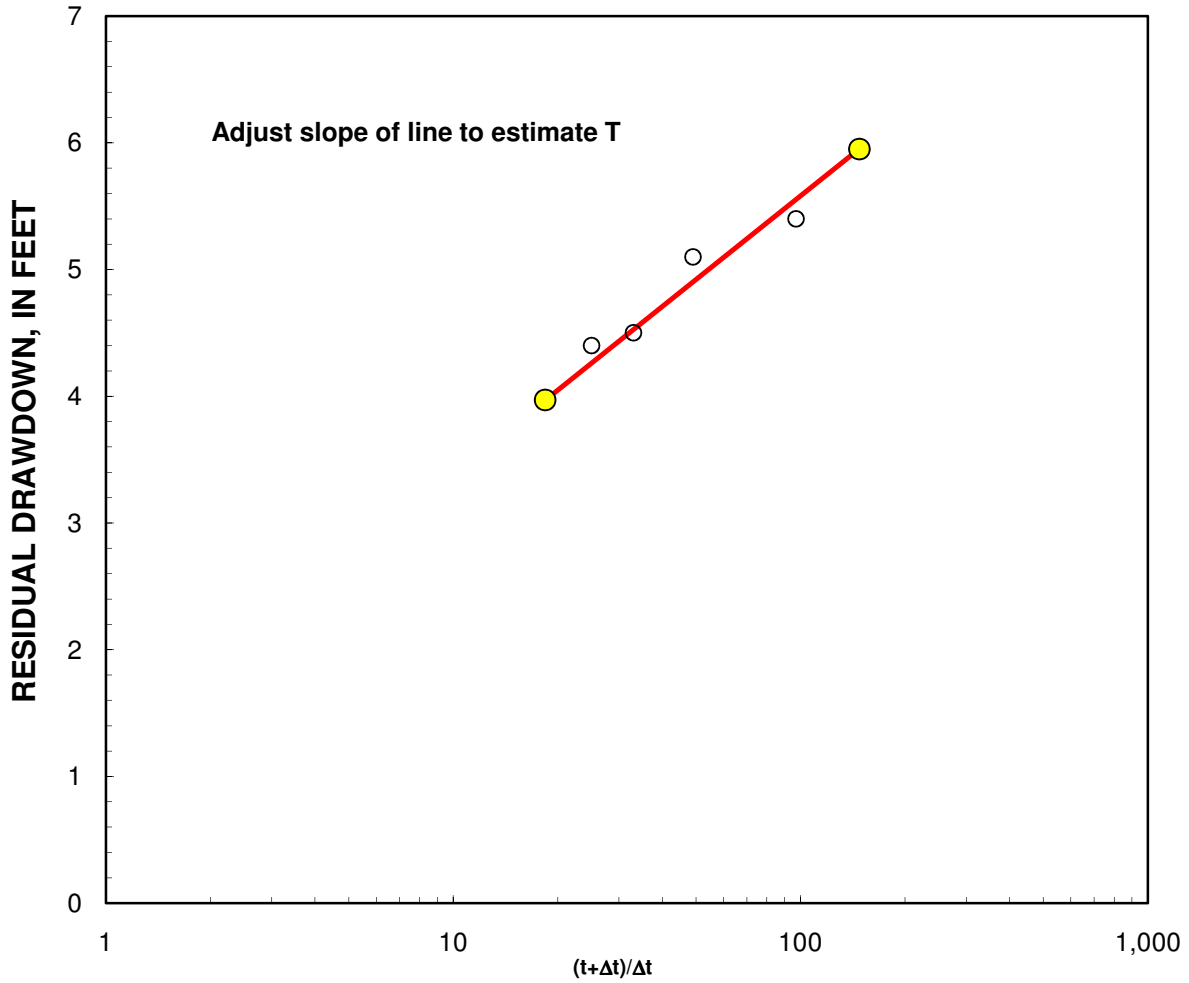
COMPUTED

Aquifer thickness = 52 Feet

Slope = 2.190265 Feet/log10

Input is consistent.

K = 11 Feet/Day
T = 580 Feet²/Day



REMARKS: Cooper-Jacob recovery analysis of single-well aquifer test

Attachment C

TTI ENVIRONMENTAL LABORATORIES

ACCREDITED IN ACCORDANCE WITH nelac

TEST REPORT

TTI Lab No: **5034036**

Customer ID:	KBAES
PO #:	N/A
Date Collected:	03/17/15
Date Received:	03/18/15
Date Reported:	03/20/15

Joe Schwartz
KBA EnviroScience. LTD
101 East Southwest Pkwy, Suite 114
Lewisville, TX 75067

Dear Joe Schwartz:

Please find the enclosed analytical results for the samples you submitted to TTI Environmental Laboratories.

The as-is-received samples were suitably preserved and prepared as per EPA approved methodology. The determinations were carried out using EPA approved methods. The test results are tabulated in the attached tables. The analytical data contained in these tables has undergone a thorough review and is deemed to be accurate and complete.

Everyone in our organization will work hard to earn your continued support. We appreciate the opportunity to do business with you and look forward to a growing relationship in the future.

Please do not hesitate to contact us, if we can be of any service to you or if you have any questions, at (817) 861-5322.

Brandi Rose
Project Manager

TTI ENVIRONMENTAL LABORATORIES

ACCREDITED IN ACCORDANCE WITH nelac

Project Name: Vitruvian Park
Project No: N/A

TTI Lab No: 5034036
Date Sampled: 03/17/2015
Date Received: 03/18/2015
Date Reported: 03/20/2015

Client Sample ID	Laboratory ID	Matrix	Sampled:
FB-1 2containers	5034036-01	Water	03/17/2015
FB-2 2containers	5034036-02	Water	03/17/2015
FB-3 2containers	5034036-03	Water	03/17/2015

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TTI ENVIRONMENTAL LABORATORIES

ACCREDITED IN ACCORDANCE WITH nelac

Project Name: Vitruvian Park
Project No: N/A

TTI Lab No: 5034036
Date Sampled: 03/17/2015
Date Received: 03/18/2015
Date Reported: 03/20/2015

SAMPLE ID: FB-1 2containers
TTI SAMPLE NO: 5034036-01

CLASSICAL CHEMISTRY PARAMETERS

ANALYTE	METHOD NUMBER	MDL	S.Q.L.	M.Q.L.	SAMPLE RESULTS	UNITS	FLG	ANAL.	ANALYZED
Chloride	EPA 300A	0.0300	0.300	1.00	56.0	mg/L		VK	03/19/15
pH	EPA 150.1				7.61	pH Units	P-02	MC	03/18/15
Total Dissolved Solids	SM2540 C	1.00	1.00	5.00	436	mg/L		CS	03/20/15
Sulfate	EPA 300A	0.092	0.920	10.00	92.90	mg/L		VK	03/19/15

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TTI ENVIRONMENTAL LABORATORIES

ACCREDITED IN ACCORDANCE WITH nelac

Project Name: Vitruvian Park
Project No: N/A

TTI Lab No: 5034036
Date Sampled: 03/17/2015
Date Received: 03/18/2015
Date Reported: 03/20/2015

SAMPLE ID: FB-2 2containers
TTI SAMPLE NO: 5034036-02

CLASSICAL CHEMISTRY PARAMETERS

ANALYTE	METHOD NUMBER	MDL	S.Q.L.	M.Q.L.	SAMPLE RESULTS	UNITS	FLG	ANAL.	ANALYZED
Chloride	EPA 300A	0.0300	0.300	1.00	373	mg/L		VK	03/19/15
pH	EPA 150.1				7.69	pH Units	03, P-0	MC	03/18/15
Total Dissolved Solids	SM2540 C	1.00	1.00	5.00	2100	mg/L		CS	03/20/15
Sulfate	EPA 300A	0.092	0.920	10.00	489.5	mg/L		VK	03/19/15

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TTI ENVIRONMENTAL LABORATORIES

ACCREDITED IN ACCORDANCE WITH nelac

Project Name: Vitruvian Park
Project No: N/A

TTI Lab No: 5034036
Date Sampled: 03/17/2015
Date Received: 03/18/2015
Date Reported: 03/20/2015

SAMPLE ID: FB-3 2containers
TTI SAMPLE NO: 5034036-03

CLASSICAL CHEMISTRY PARAMETERS

ANALYTE	METHOD NUMBER	MDL	S.Q.L.	M.Q.L.	SAMPLE RESULTS	UNITS	FLG	ANAL.	ANALYZED
Chloride	EPA 300A	0.0300	0.300	1.00	66.3	mg/L		VK	03/19/15
pH	EPA 150.1				8.11	pH Units	03, P-0	MC	03/18/15
Total Dissolved Solids	SM2540 C	1.00	1.00	5.00	550	mg/L		CS	03/20/15
Sulfate	EPA 300A	0.092	0.920	10.00	126.7	mg/L		VK	03/19/15

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TTI ENVIRONMENTAL LABORATORIES

ACCREDITED IN ACCORDANCE WITH nelac

Project Name: Vitruvian Park
Project No: N/A

TTI Lab No: 5034036
Date Sampled: 03/17/2015
Date Received: 03/18/2015
Date Reported: 03/20/2015

CLASSICAL CHEMISTRY PARAMETERS - Quality Control
TTI ENVIRONMENTAL LABORATORIES

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5031913 - Default Prep GenChem											
Duplicate (5031913-DUP1)		**Source: 5034024-06**			Prepared & Analyzed: 03/18/15						
pH	7.37			pH Units		7.35			0.272	200	
Batch 5031924 - Default Prep GenChem											
Blank (5031924-BLK1)					Prepared: 03/19/15 Analyzed: 03/20/15						
Total Dissolved Solids	< 1.00	1.00	5.00	mg/L							U
LCS (5031924-BS1)					Prepared: 03/19/15 Analyzed: 03/20/15						
Total Dissolved Solids	1080	1.00	5.00	mg/L	1000		108	80-120			
LCS Dup (5031924-BSD1)					Prepared: 03/19/15 Analyzed: 03/20/15						
Total Dissolved Solids	1030	1.00	5.00	mg/L	1000		103	80-120	5.30	20	
Duplicate (5031924-DUP1)		**Source: 5034036-01**			Prepared: 03/19/15 Analyzed: 03/20/15						
Total Dissolved Solids	444	1.00	5.00	mg/L		436			1.82	10	
Batch 5031927 - Default Prep GenChem											
Blank (5031927-BLK1)					Prepared & Analyzed: 03/19/15						
Chloride	< 0.0300	0.0300	0.100	mg/L							U
Sulfate	< 0.092	0.092	1.000	"							U
LCS (5031927-BS1)					Prepared & Analyzed: 03/19/15						
Chloride	4.61	0.0300	0.100	mg/L	5.00		92.2	90-110			
Sulfate	4.870	0.092	1.000	"	5.00		97.4	80-120			
LCS Dup (5031927-BSD1)					Prepared & Analyzed: 03/19/15						
Chloride	4.76	0.0300	0.100	mg/L	5.00		95.2	90-110	3.20	20	
Sulfate	4.910	0.092	1.000	"	5.00		98.2	80-120	0.818	20	

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TTI ENVIRONMENTAL LABORATORIES

ACCREDITED IN ACCORDANCE WITH nelac

Project Name: Vitruvian Park
Project No: N/A

TTI Lab No: 5034036
Date Sampled: 03/17/2015
Date Received: 03/18/2015
Date Reported: 03/20/2015

Notes and Definitions

U	Analyte included in the analysis, but not detected
P-02	pH values were obtained upon sample receipt at the laboratory.
I-03	The sample was received outside recommended EPA holding times for the analysis requested
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

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800 106th Street
Arlington, Texas 76011

TTI ENVIRONMENTAL LABORATORIES

CHAIN OF CUSTODY RECORD

NELAP ACCREDITED LABORATORY

Telephone: (817) 861-5322
FAX: (817) 261-1717
www.ttilabs.com

CLIENT NAME	KBA EnviroScience, LTD
CLIENT CONTACT	Joe Schwartz
CLIENT ADDRESS	101 East Southwest Pkwy, Suite 114
PHONE	(972) 436-9669
FAX	
CITY, STATE, ZIP	Lewisville TX 75067
EMAIL	jschwartz@kbaenv.com
P.O. NO.	
QUOTE NO.	
PROJECT NO.	
PROJECT NAME	Intrusion Park
SAMPLER'S NAME	J. Schwartz

LAB USE

LAB NO. 50340360 (1-3)

ON ICE ☑ YES ☐ NO

TEMP OF COOLERS °C: 3 | 4 ✓ | 5 | 6 | >6

CUSTODY SEAL — Cooler: ☐ Y ☑ N — Samples: ☐ Y ☑ N

SEAL INTACT — Cooler: ☐ Y ☑ N — Samples: ☐ Y ☑ N

Sample Collection Date (Ex:mm/dd/yyyy)	Time (Ex:hh:mm)	(C)omp (G)rab	Matrix[1]	Sample Description	No./Type Containers[2] VOA	A/G 1 LT.	4 OZ.	P/O	PRES[3]	TDS	Chlorides	Sulfate	pH	DRY WT.	TRRP	HOLD[4]	TTI Lab ID
3/17/15	3:08p	G	W	FB-1 2 containers				X	6	X	X	X	X				40360-01
3/17/15	3:20p	G	W	FB-2 2 containers				X	6	X	X	X	X				-02
3/17/15	3:40p	G	W	FB-3 2 containers				X	6	X	X	X	X				-03

TURNAROUND TIME:

☐ STANDARD 5 Business Days ☐ 50% RUSH 3 Business Days ☒ 100% RUSH 1Business Day / ASAP* ☐ E.R. 300% RUSH Same Day / ASAP*

1. MATRIX: WW-Wastewater; W-Water; S-Soil; SD-Solid; L-Liquid; A-Airbag; C-Charcoal Tube; SL-Sludge; O-Oil
2. CONTAINERS: VOA-40ml vial; A/G-Amber or Glass 1 Liter; 4 oz-Glass Wide Mouth; P/O-Plastic or Other
3. PRES.: 1-None; 2-1:1 HNO_3; 3-1:1 HCL; 4-1:1 H_2SO_4; 5-NaOH; 6-Ice; 7-Other
4. HOLD: Lab will hold samples for 30 (thirty) days.

Relinquished by (Signature)	Date	Time	Received By: (Signature)	Date	Time
[signature]	3/18/15	11:31a	[signature]	3/18/15	11:31
[signature]	3/18/15	15:58	[signature]	3/18/15	15:58

REMARKS: ☐ TTI Drop Off ☑ TTI Pickup

Clients delivery of samples to TTI constitutes acceptance to reimburse TTI as per the terms and conditions listed in the price schedule.

Pace Analytical Services, Inc.
400 West Bethany Drive - Suite 190
Allen, TX 75013
(972)727-1123

May 27, 2014

Stacy Wright
City of Farmers Branch
13000 William Dodson Pkwy
Farmers Branch, TX 75381

RE: Project: None Provided
Pace Project No.: 7515422

Dear Stacy Wright:
Enclosed are the analytical results for sample(s) received by the laboratory on May 21, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Lauren Carriker
lauren.carriker@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project:	None Provided
Pace Project No.:	7515422

Dallas Certification IDs:
400 West Bethany Dr Suite 190 75013 Allen TX 75013
Texas Certification #: T104704232-13-5
Kansas Certification #: E-10388
Arkansas Certification #: 88-0647
Oklahoma Certification #: 2012-080
Louisiana Certification #: 02007

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SAMPLE SUMMARY

Project: None Provided
Pace Project No.: 7515422

Lab ID	Sample ID	Matrix	Date Collected	Date Received
7515422001	**Upstream FB**	Water	05/21/14 14:02	05/21/14 15:00
7515422002	**Dam 1 Outflow**	Water	05/21/14 14:19	05/21/14 15:00

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SAMPLE ANALYTE COUNT

Project: None Provided
Pace Project No.: 7515422

Lab ID	Sample ID	Method	Analysts	Analytes Reported
7515422001	**Upstream FB**	SM 2540C	MRU	1
		EPA 9056A	BAF	2
7515422002	**Dam 1 Outflow**	SM 2540C	MRU	1
		EPA 9056A	BAF	2

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ANALYTICAL RESULTS

Project: None Provided
Pace Project No.: 7515422

Sample: Upstream FB **Lab ID: 7515422001** Collected: 05/21/14 14:02 Received: 05/21/14 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:							
Collected By	**Chris Windham**	no units		1		05/21/14 14:02		
Collected Date	**05/21/14**	no units		1		05/21/14 14:02		
Collected Time	**14:02**	no units		1		05/21/14 14:02		
Field pH	**7.5**	Std. Units		1		05/21/14 14:02		
Field pH Ref	**SM4500**	no units		1		05/21/14 14:02		
Field Temperature	**25.2**	deg C		1		05/21/14 14:02		
Field Temp Ref	**TNI Vol. 1 Module 2**	no units		1		05/21/14 14:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**361**	mg/L	25.0	1		05/21/14 16:12		
9056 IC Anions	Analytical Method: EPA 9056A							
Chloride	**35.2**	mg/L	1.0	10		05/21/14 18:39	16887-00-6	
Sulfate	**81.3**	mg/L	1.0	10		05/21/14 18:39	14808-79-8	

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ANALYTICAL RESULTS

Project: None Provided
Pace Project No.: 7515422

Sample: Dam 1 Outflow **Lab ID: 7515422002** Collected: 05/21/14 14:19 Received: 05/21/14 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:							
Collected By	**Chris Windham**	no units		1		05/21/14 14:19		
Collected Date	**05/21/14**	no units		1		05/21/14 14:19		
Collected Time	**14:19**	no units		1		05/21/14 14:19		
Field pH	**7.8**	Std. Units		1		05/21/14 14:19		
Field pH Ref	**SM4500**	no units		1		05/21/14 14:19		
Field Temperature	**25.5**	deg C		1		05/21/14 14:19		
Field Temp Ref	**TNI Vol.1 Module 2**	no units		1		05/21/14 14:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**303**	mg/L	25.0	1		05/21/14 16:12		
9056 IC Anions	Analytical Method: EPA 9056A							
Chloride	**28.4**	mg/L	1.0	10		05/21/14 19:50	16887-00-6	
Sulfate	**58.2**	mg/L	1.0	10		05/21/14 19:50	14808-79-8	

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QUALITY CONTROL DATA

Project: None Provided
Pace Project No.: 7515422

QC Batch: WET/4116 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 7515422001, 7515422002

METHOD BLANK: 76810 | Matrix: Water
Associated Lab Samples: 7515422001, 7515422002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	05/21/14 16:08	

LABORATORY CONTROL SAMPLE: 76811

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	245	98	80-120	

SAMPLE DUPLICATE: 76812

Parameter	Units	7515302001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1080	1040	3	20	

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QUALITY CONTROL DATA

Project: None Provided
Pace Project No.: 7515422

QC Batch: WETA/4975 | Analysis Method: EPA 9056A
QC Batch Method: EPA 9056A | Analysis Description: 9056 IC Anions
Associated Lab Samples: 7515422001, 7515422002

METHOD BLANK: 76822 | Matrix: Water
Associated Lab Samples: 7515422001, 7515422002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	0.10	05/21/14 18:21	
Sulfate	mg/L	ND	0.10	05/21/14 18:21	

LABORATORY CONTROL SAMPLE: 76823

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	90-110	
Sulfate	mg/L	5	4.7	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 76824 76825

Parameter	Units	7515422001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	35.2	50	50	81.2	81.8	92	93	80-120	1	15	
Sulfate	mg/L	81.3	50	50	130	131	97	100	80-120	1	15	

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QUALIFIERS

Project: None Provided
Pace Project No.: 7515422

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The Nelac Institute

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Allen, TX 75013
(972)727-1123

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: None Provided
Pace Project No.: 7515422

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
7515422001	**Upstream FB**		FLD/		
7515422002	**Dam 1 Outflow**		FLD/		
7515422001	**Upstream FB**	SM 2540C	WET/4116		
7515422002	**Dam 1 Outflow**	SM 2540C	WET/4116		
7515422001	**Upstream FB**	EPA 9056A	WETA/4975		
7515422002	**Dam 1 Outflow**	EPA 9056A	WETA/4975		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1767059

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: City of Farmers Branch	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Cl, TDS, SO_4	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Upstream FB	WT	G			5-21-14	1402	25.2	1	X									X		001
2	Dam 1 Outflow	WT	G			5-21-14	1419	25.7	1	X									X		002
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

WO#: 7515422

7515422

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	IR01 SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Upstream FB pH 7.5, 25.2°C	[signature]	5-21-14	1500	Melissa McCoy / PACE	5-21-14	1500	3.6	Y	N	Y
Dam 1 Outflow pH 7.8, 25.7°C										

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Chris Windham

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/21/14

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical

Sample Condition Upon Receipt
Dallas

Client Name: City of Farmers Branch Project Work order: N515422

Courier: FedEX ☐ UPS ☐ USPS ☐ Client ☐ Courier ☐ LSO ☐ PACE ☒ Other:_____

Tracking#:_____

Custody Seal on Cooler/Box: Yes ☐ No ☒ **Seals Intact:** Yes ☐ No ☐ NA ☒

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: IR-01 Type of Ice: Wet ☒ Blue ☐ None ☐ Sample Received on ice, cooling process has begun ☒

Cooler Temp: 3.6°C (Temp should be above freezing to 6°C)

Chain of Custody Present	Yes ☒ No ☐ NA ☐	1
Chain of Custody filled out	Yes ☒ No ☐ NA ☐	2
Chain of Custody relinquished	Yes ☒ No ☐ NA ☐	3
Sampler name & signature on COC	Yes ☒ No ☐ NA ☐	4
Sample received within HT	Yes ☒ No ☐ NA ☐	5
Short HT analyses (<72 hrs)	Yes ☐ No ☒ NA ☐	6
Rush TAT requested	Yes ☒ No ☐ NA ☐	7
Sufficient Volume received	Yes ☒ No ☐ NA ☐	8
Correct Container used Pace Container used	Yes ☒ No ☐ NA ☐ Yes ☒ No ☐ NA ☐	9
Container Intact	Yes ☒ No ☐ NA ☐	10
Unpreserved 5035A soil frozen within 48 hrs	Yes ☐ No ☐ NA ☒	11
Filtered volume received for Dissolved tests	Yes ☐ No ☐ NA ☒	12
Sample labels match COC Include date/time/ID/analyses Matrix: water	Yes ☒ No ☐ NA ☐	13
All containers needing preservation have been checked	Yes ☐ No ☐ NA ☒	14a. Lot# of pH strip:_____ pH checked Yes ☐ No ☐ pH<2 ☐ pH>9 ☐ pH>12 ☐ Lot# of Iodine strip:_____ Lot# of Lead Acetate strip:_____
Do containers require preservation at the lab	Yes ☐ No ☐ NA ☒	14b. Preservation: Lot#:
All containers needing preservation are found to be in Compliance with EPA recommendation Exception: VOA, coliform, O&G	Yes ☐ No ☐ NA ☒ Yes ☐ No ☒	14c.
Trip Blank present Trip Blank Custody Seals Intact Pace Trip Blank Lot# (if purchased):_____	Yes ☐ No ☐ NA ☒ Yes ☐ No ☐ NA ☒	15
Headspace in VOA (>6mm)	Yes ☐ No ☐ NA ☒	16
Project sampled in USDA Regulated Area:	Yes ☐ No ☐ NA ☒	17. List State _____

Client Notification/Resolution/Comments:

Person Contacted:_____ Date:_____

Comments/Resolution:_____

Person Examining Contents: mm Date: 5-21-14

Sample Container Count

Pace Analytical™ www.pacelabs.com

COC PAGE 1 of 1
COC ID# 1767058

Pace Project # 0515422

Sample Line Item	BP2N	AG1U	VG9U	VG9H	BP2S	BP1U	BP2U	BG1H	AG1S	BP20	SP5T	WGFU	WGKU			Comments
1							1									
2							1									
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																

Container Codes

DG9H	40mL HCL amber voa vial	AF	Air Filter	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber gl	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved **amber** vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber gla	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber gla	BP3A	250mL NaOh, Asc Acid plastic	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved **clear** vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear gla	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFX	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag
WGKU	8oz wide jar upreserved	SP5T	120mL Coliform Na Thiosulfate	SP5U	120mL Coliform unpreserved	GN	General unpreserved
Other	Other						

F-DAL-C-003 rev.00 11-5-2012

Analytical Report 494828

for

TCEQ-Region 04

Project Manager: Michael Sessions

004659

004659

15-OCT-14

Collected By: Client

9701 Harry Hines Blvd, Dallas, TX 75220

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-14-16-TX), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
New Jersey (TX007), North Carolina(681), Oklahoma (9218), Pennsylvania (68-03610)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Texas (T104704477), Louisiana (04176), USDA (P330-07-00105)

Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

RECEIVED
OCT 15 2014
DFW REGION-4

XENCO Laboratories

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XENCO Laboratories

15-OCT-14

Project Manager: **Michael Sessions**
TCEQ-Region 04
2309 Gravel Drive
Fort Worth, TX 76118

Reference: XENCO Report No(s): **494828**
004659
Project Address: 004659

Michael Sessions :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 494828. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 494828 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,
Monica Tobar

Monica Tobar
Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America

Sample Cross Reference 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
004659-01	W	10-08-14 14:47		494828-001
004659-02	W	10-08-14 14:49		494828-002
004659-03	W	10-08-14 15:05		494828-003
004659-04	W	10-08-14 15:07		494828-004
004659-05	W	10-08-14 15:17		494828-005
004659-06	W	10-08-14 15:18		494828-006
004659-07	W	10-08-14 15:31		494828-007
004659-08	W	10-08-14 15:32		494828-008

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: 004659-01 Matrix: Water Date Received:10.08.14 16.15
Lab Sample Id: 494828-001 Date Collected: 10.08.14 14.47

Analytical Method: TDS by SM2540C
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952941

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	246	10.0	mg/L	10.13.14 16.30		1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952842

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	22.8	5.00	mg/L	10.13.14 09.05		5

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952846

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	24.3	5.00	mg/L	10.10.14 00.00		2

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: 004659-02 Matrix: Water Date Received:10.08.14 16.15
Lab Sample Id: 494828-002 Date Collected: 10.08.14 14.49

Analytical Method: TDS by SM2540C
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952941

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	266	10.0	mg/L	10.13.14 16.30		1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952842

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	23.8	4.00	mg/L	10.13.14 09.05		4

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952846

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	24.0	5.00	mg/L	10.10.14 00.00		2

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: **004659-03** Matrix: Water Date Received:10.08.14 16.15
Lab Sample Id: 494828-003 Date Collected: 10.08.14 15.05

Analytical Method: TDS by SM2540C
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952941

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	**1830**	10.0	mg/L	10.13.14 16.30		1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952842

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**347**	20.0	mg/L	10.13.14 09.05		20

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952846

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	**22.9**	5.00	mg/L	10.10.14 00.00		20

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: **004659-04** Matrix: Water Date Received:10.08.14 16.15
Lab Sample Id: 494828-004 Date Collected: 10.08.14 15.07

Analytical Method: TDS by SM2540C
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952941

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	**1870**	10.0	mg/L	10.13.14 16.30		1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952842

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**337**	20.0	mg/L	10.13.14 09.05		20

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952846

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	**6.96**	5.00	mg/L	10.10.14 00.00		50

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: **004659-05** Matrix: Water Date Received:10.08.14 16.15
Lab Sample Id: 494828-005 Date Collected: 10.08.14 15.17

Analytical Method: TDS by SM2540C
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952941

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	**172**	10.0	mg/L	10.13.14 16.30		1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952842

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**17.0**	10.0	mg/L	10.13.14 09.05		10

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952846

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	**19.0**	5.00	mg/L	10.10.14 00.00		2

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: **004659-06** Matrix: Water Date Received:10.08.14 16.15
Lab Sample Id: 494828-006 Date Collected: 10.08.14 15.18

Analytical Method: TDS by SM2540C
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952941

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	**166**	10.0	mg/L	10.13.14 16.30		1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952842

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**16.1**	2.00	mg/L	10.13.14 09.05		2

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952846

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	**13.5**	5.00	mg/L	10.10.14 00.00		2

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: 004659-07 | Matrix: Water | Date Received:10.08.14 16.15
Lab Sample Id: 494828-007 | Date Collected: 10.08.14 15.31

Analytical Method: TDS by SM2540C
Tech: BBK
Analyst: BBK
Seq Number: 952941
% Moisture:

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	134	10.0	mg/L	10.13.14 16.30		1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-Cl- B
Tech: BBK
Analyst: BBK
Seq Number: 952842
% Moisture:

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	14.0	2.00	mg/L	10.13.14 09.05		2

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK
Analyst: BBK
Seq Number: 952846
% Moisture:

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	13.3	5.00	mg/L	10.10.14 00.00		2

Certificate of Analytical Results 494828

TCEQ-Region 04, Fort Worth, TX

004659

Sample Id: **004659-08** Matrix: Water Date Received:10.08.14 16.15
Lab Sample Id: 494828-008 Date Collected: 10.08.14 15.32

Analytical Method: TDS by SM2540C
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952941

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total dissolved solids	TDS	<10.0	10.0	mg/L	10.13.14 16.30	U	1

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952842

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	14.1	2.00	mg/L	10.13.14 09.05		2

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Tech: BBK % Moisture:
Analyst: BBK
Seq Number: 952846

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Sulfate	14808-79-8	15.1	5.00	mg/L	10.10.14 00.00		2

QC Summary 494828

TCEQ-Region 04
004659

Analytical Method: TDS by SM2540C
Seq Number: 952941 Matrix: Water
MB Sample Id: 952941-1-BLK LCS Sample Id: 952941-1-BKS LCSD Sample Id: 952941-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Total dissolved solids	<10.0	1000	926	93	962	96	80-120	4	30	mg/L	10.13.14 16:30	

Analytical Method: TDS by SM2540C
Seq Number: 952941 Matrix: Water
Parent Sample Id: 494734-001 MD Sample Id: 494734-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total dissolved solids	492	530	7	10	mg/L	10.13.14 16:30	

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Seq Number: 952842 Matrix: Water
MB Sample Id: 952842-1-BLK LCS Sample Id: 952842-1-BKS LCSD Sample Id: 952842-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<1.00	5.00	5.54	111	5.40	108	70-125	3	25	mg/L	10.13.14 09:05	

Analytical Method: Chloride, Mercuric Nitrate Method by SM4500-CI- B
Seq Number: 952842 Matrix: Water
Parent Sample Id: 494828-001 MS Sample Id: 494828-001 S MSD Sample Id: 494828-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	22.8	25.0	46.7	96	48.0	101	70-125	3	25	mg/L	10.13.14 09:05	

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Seq Number: 952846 Matrix: Water
MB Sample Id: 952846-1-BLK LCS Sample Id: 952846-1-BKS LCSD Sample Id: 952846-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Sulfate	<5.00	20.0	20.1	101	22.7	114	80-120	12	20	mg/L	10.10.14 00:00	

Analytical Method: Sulfate, Turbidimetric by EPA 375.4
Seq Number: 952846 Matrix: Water
Parent Sample Id: 494828-001 MS Sample Id: 494828-001 S MSD Sample Id: 494828-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Sulfate	24.3	20.0	40.6	82	41.4	86	80-120	2	20	mg/L	10.10.14 00:00	

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Chain of Custody Record 4948280

W 004659

Send to:
☐ Houston Laboratory
Phone: 281-457-5229
☒ Xenco

Region: 4 Organization #: 06104 PCA Code: ~~04109~~ ns Program: Water Rights

Sampler Name: Michael Sessions (print) Sampler Signature: [signature]

Sampler phone number: 817-588-5899 E-Mail ID: michael.sessions@tceq.tx.gov

LAB USE ONLY	Sample ID	Sampling Date	Sampling Time	Comp	Grab	Matrix (L = Liquid, S = Solid)	No. of Containers	BOD	CBOD	TSS	NH_3-N	E. Coli	TDS	SO_4^{-2}	Cl^-			Remarks
	Containers*												P	P	P			
	Preservatives**												1	1	1			
	-01	10/8/14	2:47pm	X		L	2						X	X	X			
	-02	10/8/14	2:49pm	X		L	2						X	X	X			
	-03	10/8/14	3:05pm	X		L	2						X	X	X			
	-04	10/8/14	3:07pm	X		L	2						X	X	X			
	-05	10/8/14	3:17pm	X		L	2						X	X	X			
	-06	10/8/14	3:18pm	X		L	2						X	X	X			
	-07	10/8/14	3:31pm	X		L	2						X	X	X			
	-08	10/8/14	3:32pm	X		L	1						X	X	X			

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Michael Sessions	10/8/14	4:15pm	[signature]	10/8/14	4:15

Shipper Name: Shipper Number:

*Containers: P = Plastic G = Clear Glass A = Amber Glass V = VOA Vials O = Other

**Preservatives: 1 = Ice 2 = H_2SO_4 3 = HCl 4 = HNO_3 5 = $Na_2S_2O_3$ 6 = Other

FOR LAB USE ONLY

Received on Ice: ☒ Y ☐ N

Temp Device: XDA
As Read: 1.8 C (+0.8)
Corrected: 2.6 C

COC Seal: ☒ Y ☐ N

Sample Intact: ☒ Y ☐ N

TCEQ-20648 (Rev. 8/13) White (Original) - Lab Yellow - Lab Pink - Collector Copy

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: TCEQ-Region 04

Date/ Time Received: 10/08/2014 04:15:00 PM

Work Order #: 494828

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : XDA

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	2.6	
#2 *Shipping container in good condition?	Yes	
#3 *Samples received on ice?	Yes	
#4 *Custody Seals intact on shipping container/ cooler?	N/A	
#5 Custody Seals intact on sample bottles?	N/A	
#6 *Custody Seals Signed and dated?	N/A	
#7 *Chain of Custody present?	Yes	
#8 Sample instructions complete on Chain of Custody?	Yes	
#9 Any missing/extra samples?	No	
#10 Chain of Custody signed when relinquished/ received?	Yes	
#11 Chain of Custody agrees with sample label(s)?	Yes	
#12 Container label(s) legible and intact?	Yes	
#13 Sample matrix/ properties agree with Chain of Custody?	Yes	
#14 Samples in proper container/ bottle?	Yes	
#15 Samples properly preserved?	Yes	
#16 Sample container(s) intact?	Yes	
#17 Sufficient sample amount for indicated test(s)?	Yes	
#18 All samples received within hold time?	Yes	
#19 Subcontract of sample(s)?	No	
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A	
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	N/A	
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A	

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: M. Watkins — Mandy Watkins — Date: 10/08/2014

Checklist reviewed by: Angelica Martinez — Angelica Martinez — Date: 10/09/2014