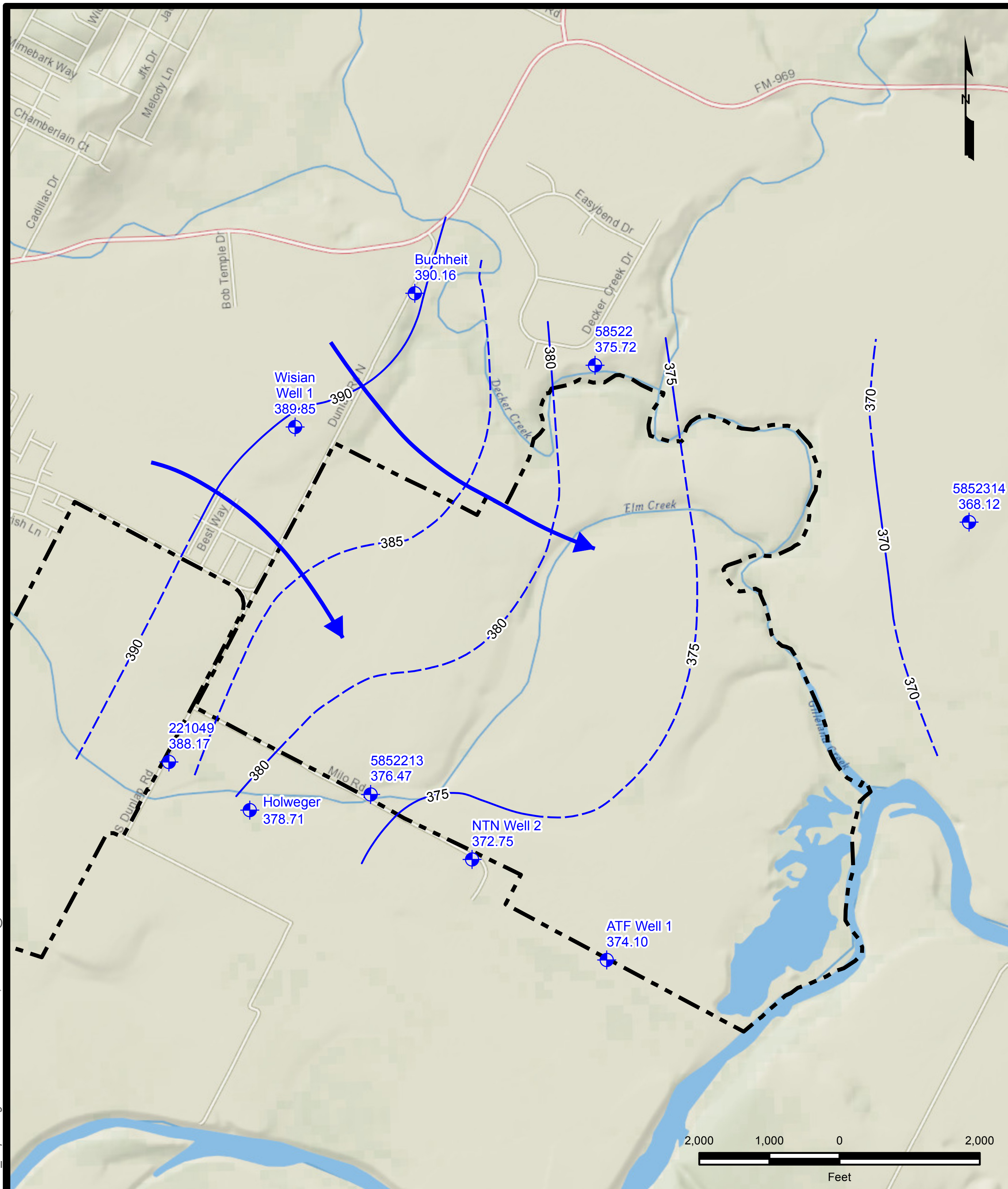
Table 3-3. Air Quality $PM_{2.5}$ and PM_{10} Size Fraction Results

Sampling Event	Date	North Site		South Site	
		PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
1	10/20/2011	28.1	7.6	15.8	7.5
1	10/23/2011	24.9	10.7	19.9	10.7
1	10/26/2011	11.9	8.1	15.0	8.2
1	10/29/2011	27.5	9.0	22.1	10.3
1	11/1/2011	22.6	11.7	28.6	13.6
1	11/4/2011	15.4	6.7	NV-L	7.4
2	1/5/2012	21.9	4.0	24.6	10.8
2	1/8/2012	31.7	10.3	31.9	19.3
2	1/11/2012	11.8	NS	12.5	6.5
2	1/14/2012	33.2	NS	17.5	8.9
2	1/17/2012	13.6	NS	13.9	NS[1]
2	1/20/2012	21.5	NS	60.1	16.0
3	3/15/2012	14.7	10.0	NS	9.0
3	3/18/2012	12.9	7.8	NS	10.3
3	3/21/2012	13.8	5.7	NS	5.8
3	3/24/2012	16.5	12.5	NS	11.7
3	3/27/2012	18.1	10.6	NS	NV-C
3	3/30/2012	19.6	13.3	NS	12.2
4	5/3/2012	16.5	NV-L	22.4	NS
4	5/6/2012	14.7	NV-L	22.8	NS
4	5/9/2012	19.7	12.5	32.9	NS
4	5/12/2012	11.3	9.2	16.7	NS
4	5/15/2012	17.2	8.5	27.9	NS
4	5/18/2012	18.1	NV-L	22.2	NS
	Average	**19.1**	**9.3**	**23.9**	**10.5**

µg/m^3 - Micrograms per cubic meter.
NS - Not sampled due to faulty air pump.
NS[1] - Not sample due to faulty wire.
NV-C - Sample not valid due to filter contamination.
NV-L - Sample not valid due to low value.
PM_{10} - Particulate matter less than 10 microns in diameter.
PM_{25} - Particulate matter less than 2.5 microns in diameter.



Legend

- TXI Mining Site
- Groundwater Well Location
- Potentiometric Surface Contour (ft msl) (Dashed Where Inferred)
- Groundwater Flow Direction

URS

9400 Amberglen Blvd.
Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474

Site:	Travis County CRCP
Title:	**Figure 3-1 Potentiometric Surface Map October 18-19, 2011**

Drawn by:	Date:	Drawing File:	Figure:
Gary_Callahan	22 Aug 2012	Fig 3-1 GWE101811	3-1

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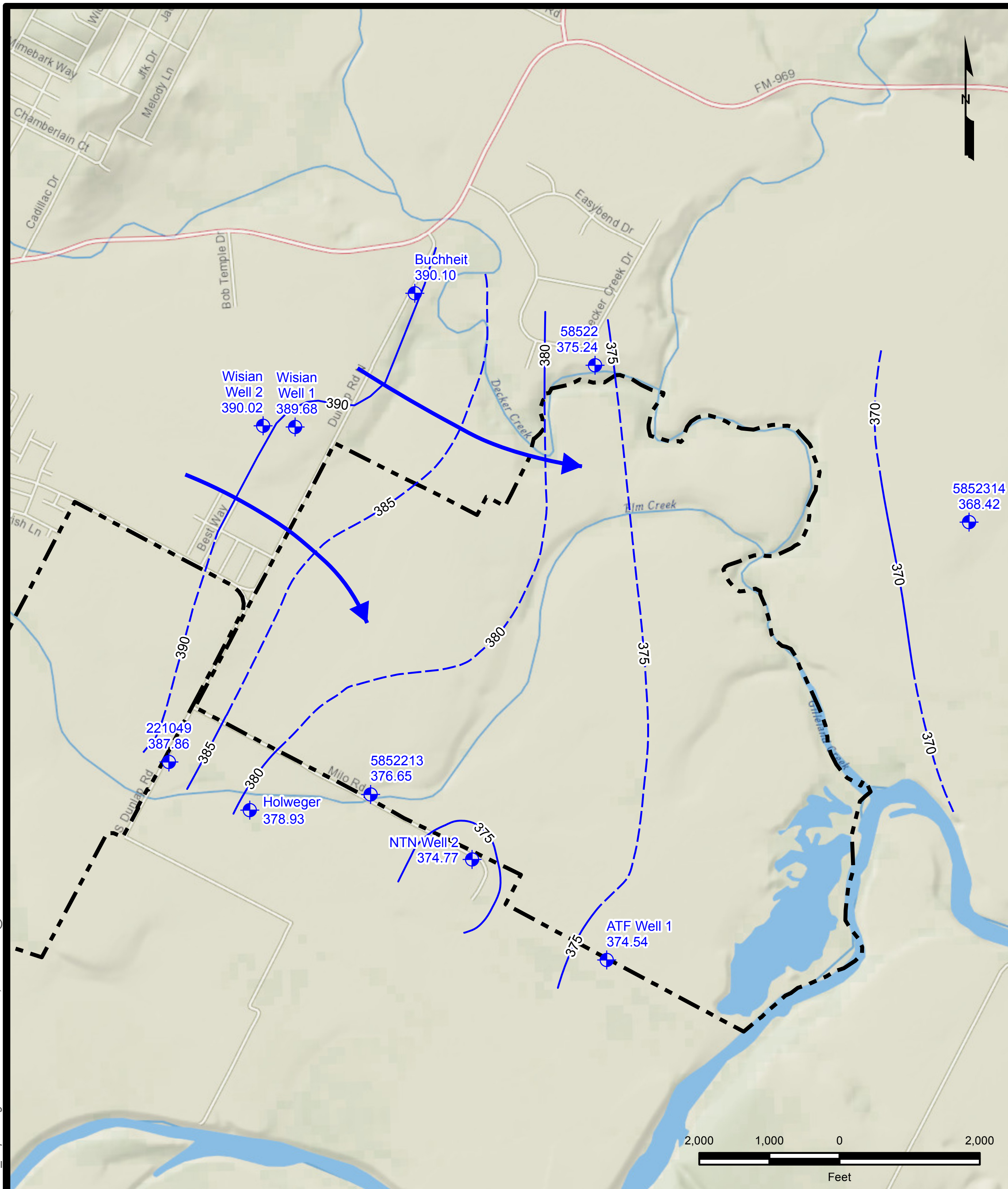

Legend

TXI Mining Site

Groundwater Well Location

Potentiometric Surface Contour
(ft msl) (Dashed Where Inferred)

Groundwater Flow Direction

URS

9400 Amberglen Blvd.
Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474

Site: Travis County CRCP

Title: **Figure 3-2**
Potentiometric Surface Map
November 29-30, 2011

Drawn by:	Date:	Drawing File:	Figure:
Gary_Callahan	22 Aug 2012	Fig 3-2 GWE112911	3-2

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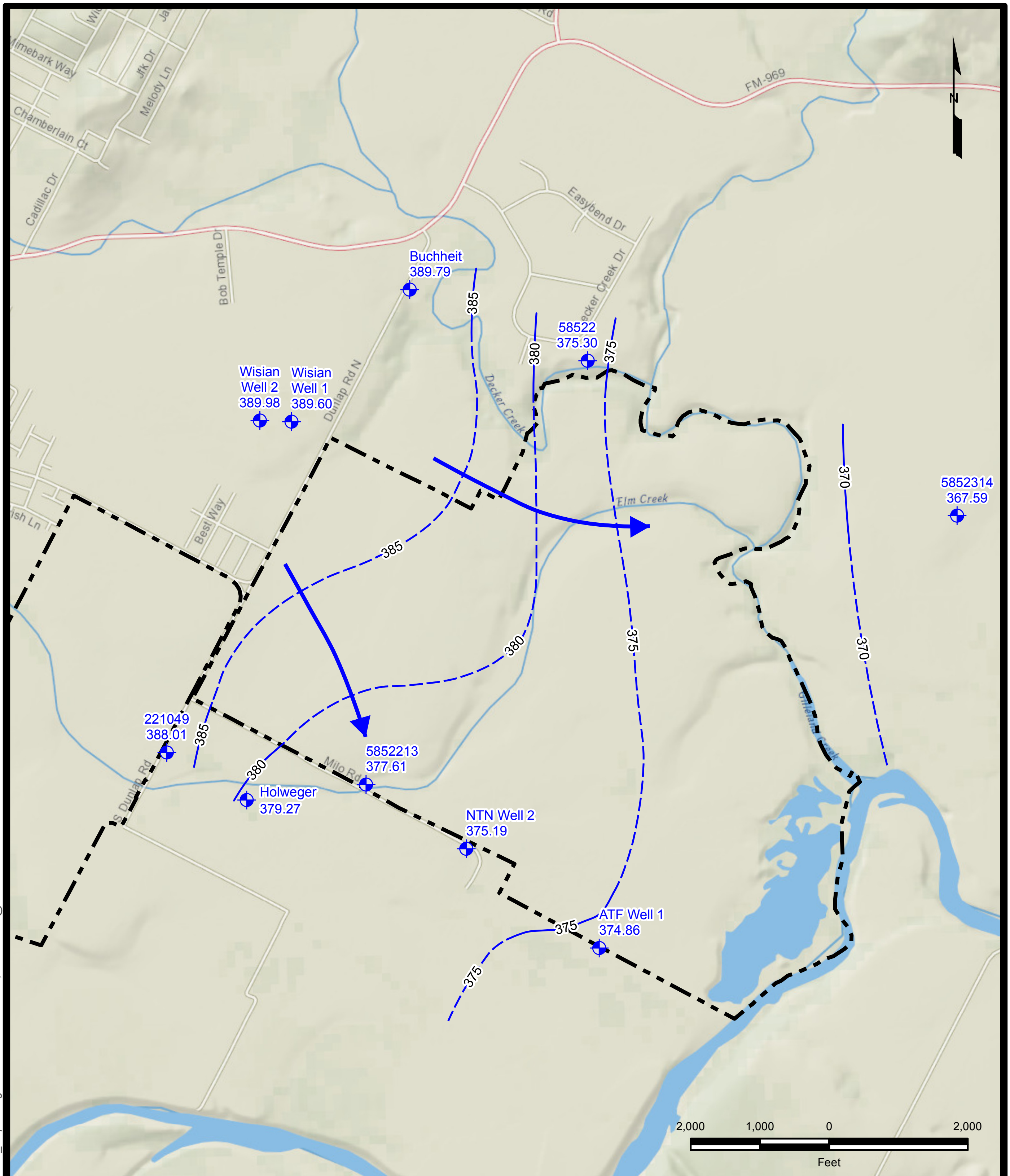

Legend

TXI Mining Site

Groundwater Well Location

Potentiometric Surface Contour (ft msl) (Dashed Where Inferred)

Groundwater Flow Direction

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Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474

Site: Travis County CRCP

Title:

Figure 3-3
Potentiometric Surface Map
January 4-5, 2012

Drawn by:	Date:	Drawing File:	Figure:
Gary_Callahan	22 Aug 2012	Fig 3-3 GWE010412	3-3

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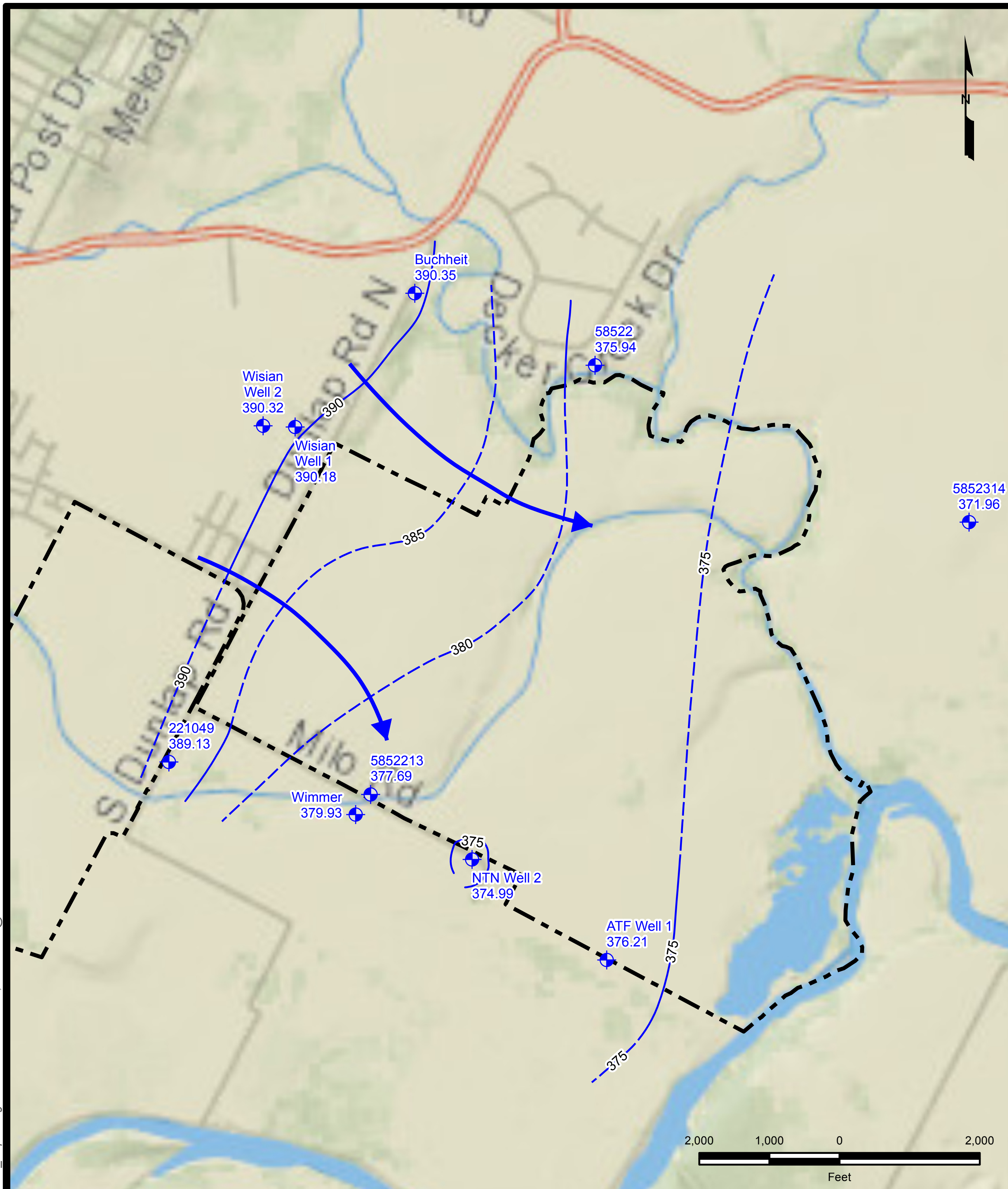

Legend

TXI Mining Site

Groundwater Well Location

Potentiometric Surface Contour
(ft msl) (Dashed Where Inferred)

Groundwater Flow Direction

URS

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Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474

Site:
Travis County CRCP

Title:
Figure 3-4
Potentiometric Surface Map
February 15-16, 2012

Drawn by:	Date:	Drawing File:	Figure:
Gary_Callahan	22 Aug 2012	Fig 3-4 GWE021512	3-4

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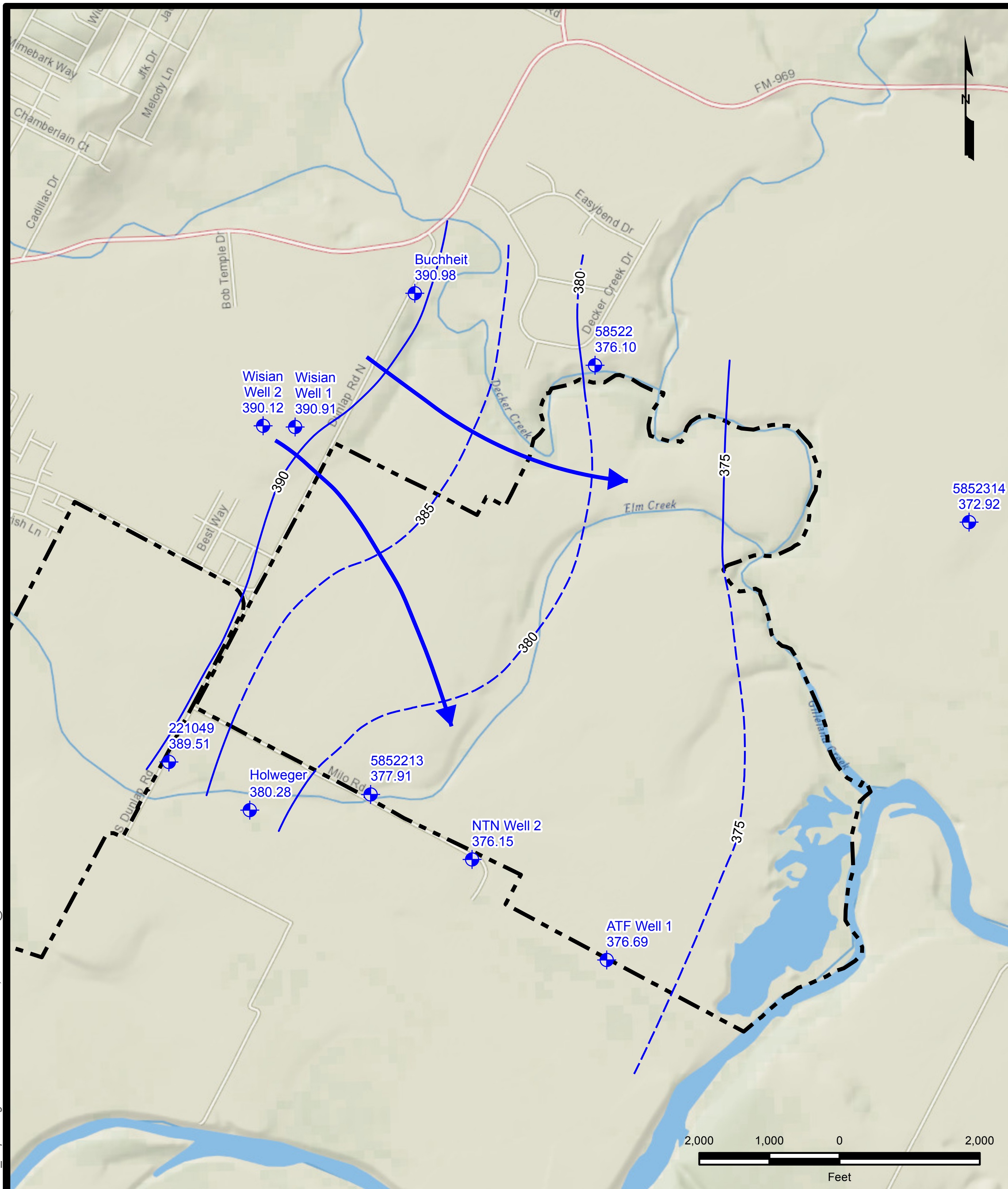

Legend

TXI Mining Site

Groundwater Well Location

Potentiometric Surface Contour (ft msl) (Dashed Where Inferred)

Groundwater Flow Direction

URS

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Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474

Site:	Travis County CRCP
Title:	**Figure 3-5 Potentiometric Surface Map March 26-27, 2012**

Drawn by:	Date:	Drawing File:	Figure:
Gary_Callahan	22 Aug 2012	Fig 3-5 GWE0032612	3-5

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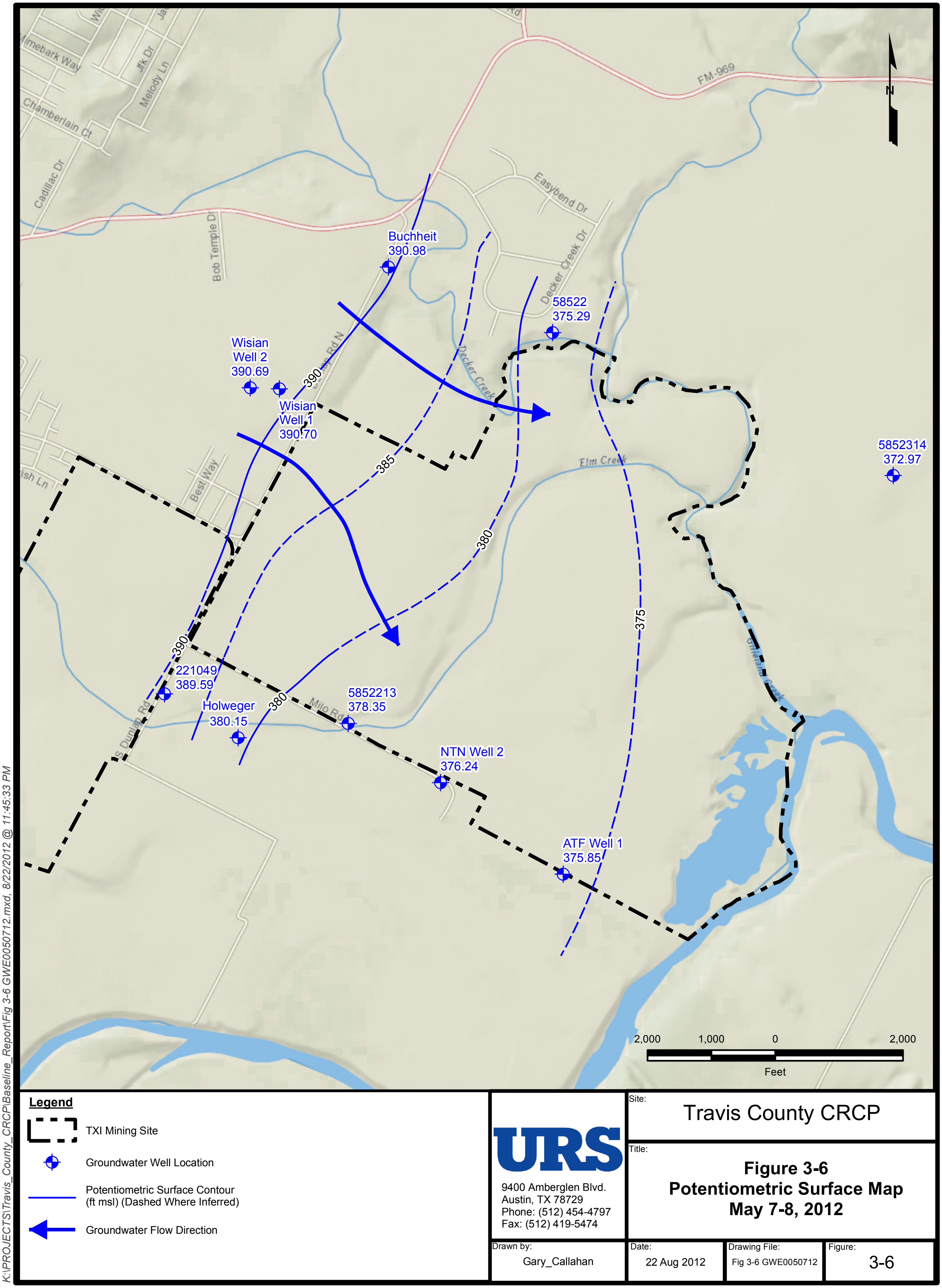

Buchheit
390.98
58522
375.29
Wisian
Well 2
390.69
Wisian
Well 1
390.70
5852314
372.97
221049
389.59
Holweger
380.15
5852213
378.35
NTN Well 2
376.24
ATF Well 1
375.85
390
385
380
375
FM-969
Easybend Dr
Decker Creek Dr
Decker Creek
Elm Creek
Bob Temple Dr
Cadillac Dr
Chamberlain Ct
Melody Ln
Jfk Dr
Best Way
Milo Rd
S Dunlap Rd
N
2,000 1,000 0 2,000
Feet
Legend
TXI Mining Site
Groundwater Well Location
Potentiometric Surface Contour
(ft msl) (Dashed Where Inferred)
Groundwater Flow Direction
URS
9400 Amberglen Blvd.
Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474
Site:
Travis County CRCP
Title:
Figure 3-6
Potentiometric Surface Map
May 7-8, 2012
Drawn by:
Gary_Callahan
Date:
22 Aug 2012
Drawing File:
Fig 3-6 GWE0050712
Figure:
3-6
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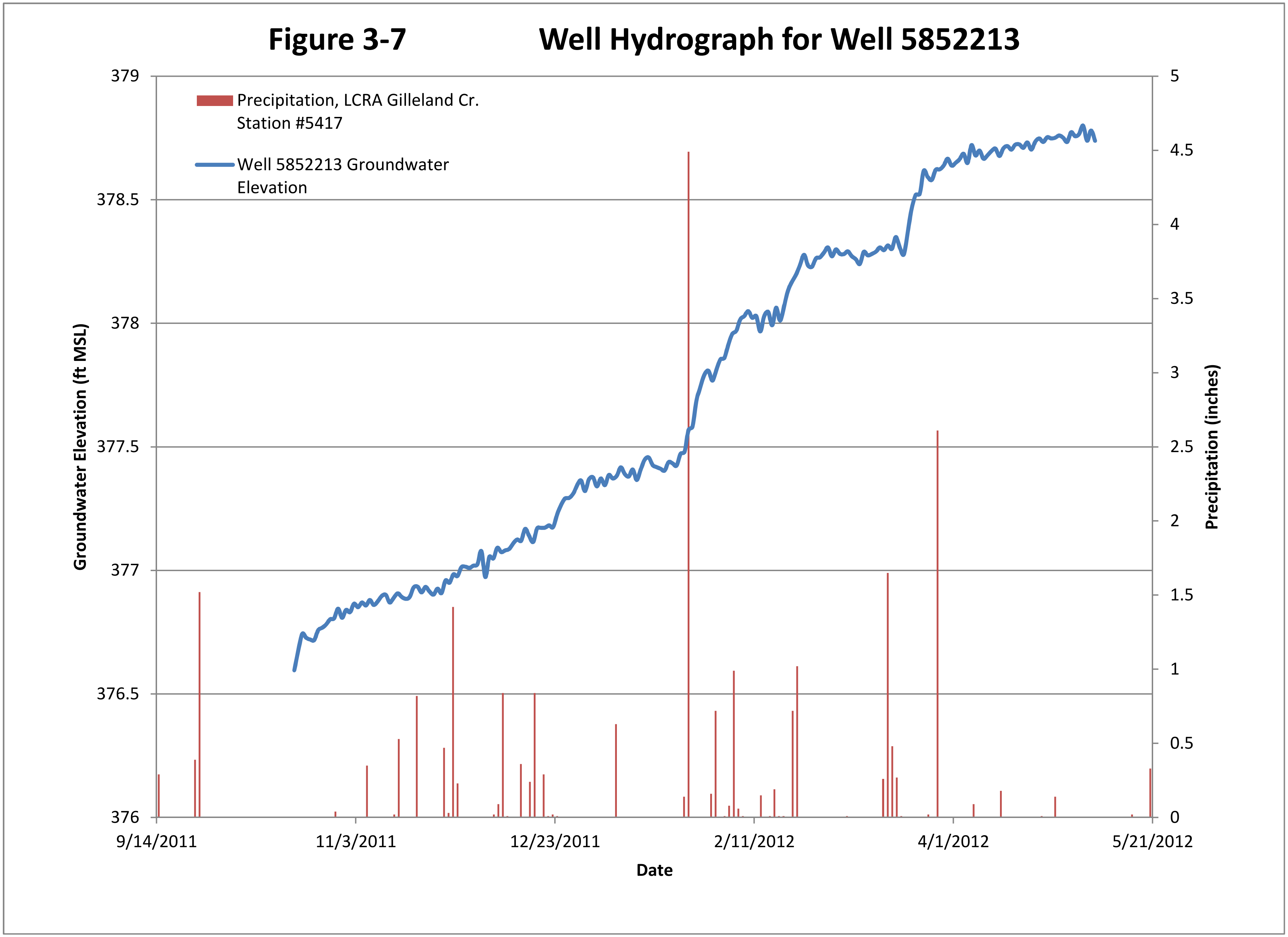
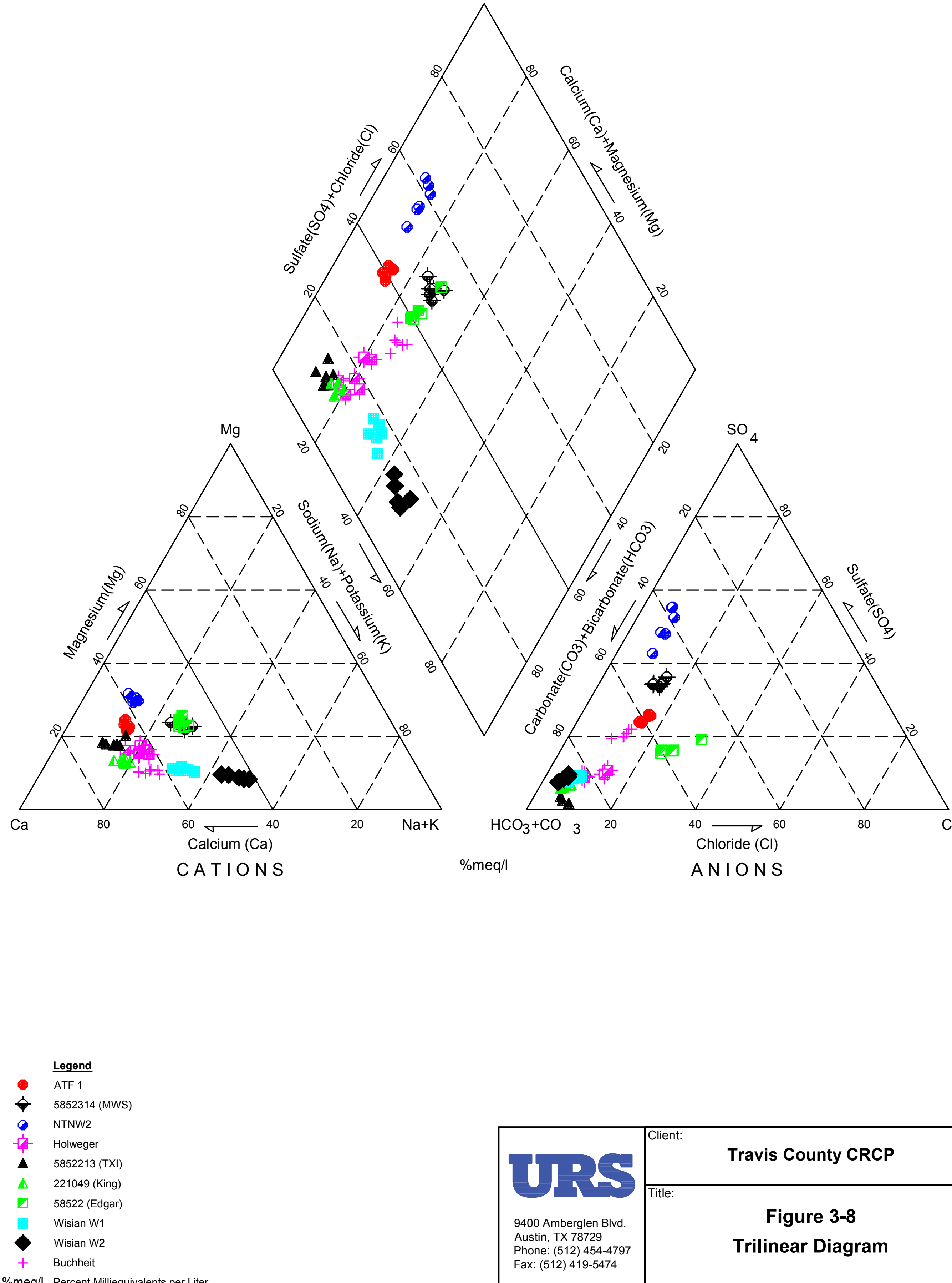


Figure 3-7
Well Hydrograph for Well 5852213
Precipitation, LCRA Gilleland Cr. Station #5417
Well 5852213 Groundwater Elevation
Groundwater Elevation (ft MSL)
Precipitation (inches)
Date
379
378.5
378
377.5
377
376.5
376
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
9/14/2011
11/3/2011
12/23/2011
2/11/2012
4/1/2012
5/21/2012



File: K:\PROJECTS\Travis_County_CRCP\Baseline_Report\Diagrams.dwg Layout: Fig 3-8 Plotted: Aug 22, 2012 - 11:12pm

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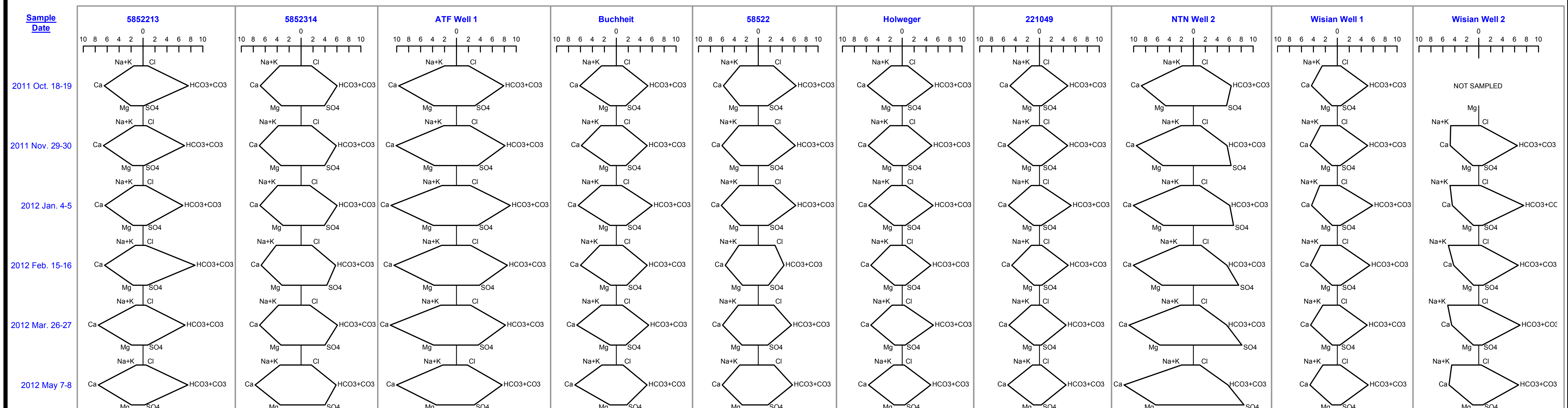
Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474

Client:	Travis County CRCP	
Title:	**Figure 3-8** **Trilinear Diagram**	
Drawn by:	Date: Aug 22, 2012	Figure: 3-8



Concentrations (milliequivalents per liter) of selected cations and anions from the 10 wells were used for the groundwater assessment and sampled approximately bi-monthly.

File: K:\PROJECTS\Travis_County_CRCP\Baseline_Report\Diagrams.dwg Layout: Fig 3-9 Plotted: Aug 23, 2012 - 1:48pm

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9400 Amberglen Blvd.
Austin, TX 78729
Phone: (512) 454-4797
Fax: (512) 419-5474

Client: **Travis County CRCP**

Title: **Figure 3-9**
Stiff Diagrams

Drawn by:	Date:	Drawing File:	Figure:
Gary_Callahan	Aug 23, 2012	Diagrams.dwg	3-9

4.0 ENVIRONMENTAL MONITORING DATA EVALUTION

4.1 Task 1, Groundwater Evaluation

Baseline groundwater availability and quality conditions were evaluated using the groundwater data collected during the six approximately bi-monthly groundwater sampling events.

Groundwater Availability

The general groundwater flow direction of the Colorado River Alluvial Aquifer within the study area is towards the east and southeast with an average hydraulic gradient of 0.0023 (Figures 3-1 to 3-6). The groundwater flow direction appears to be influenced by pumping wells NTN Well 2, ATF Well 1 and well 5852314. Wells 5852314 and NTN Well 2 have the most significant influence on the potentiometric surface because of their daily cyclical pumping rates of approximately 670 gallons per minute (gpm) and 300 gpm respectively. Well ATF Well 1 has an approximate pumping rate of 450 gpm, but it not used on a regular basis. However, localized buried gravel channels within the Colorado Alluvial Aquifer may provide conduits for groundwater flow in directions not consistent with the general east-southeast groundwater flow direction. From October 2011 to May 2012 the groundwater elevation in the area rose in each of the 10 wells monitored. Table 4-1 shows the change in groundwater elevation at each well.

The rise in groundwater elevation is likely a recovery response caused by above average precipitation during November and December 2011, and January to March 2012 recharging the Colorado River Alluvial aquifer after the extreme dry conditions that persisted from February to October 2011. The 2011 rainfall total recorded at Austin Bergstrom International Airport (ABIA) was only 16.98 inches and well below the average yearly rainfall of 32.52 inches. Precipitation data from 1942 to 2012 at ABIA is included as Appendix D. Additionally, the observed groundwater elevation recorded with the transducer in well 5852213 shows marked increased water levels corresponding to precipitation events and relatively flat water level trends during periods of little or no precipitation (Figure 3-7).

Availability of groundwater for domestic, agricultural, and municipal use from the Colorado River Alluvial Aquifer is dependent upon the aquifer potentiometric surface remaining within or above the screened intervals of existing wells and is largely controlled by local precipitation recharge. Loss of groundwater elevation resulting in diminished or complete loss of groundwater availability was observed in the Glass well where only 0.22 to 0.40 ft of water was in the well (Table 3-1), and presumably was a result of dry climatic conditions. Not including the Glass well, the observed thickness of water in wells included in the monitoring program ranged from 4.23 ft (Buchheit Well on January 5, 2012) to 24.25 ft (Well ATF W 1 on March 27, 2012) (Table 3-1). Overall groundwater elevations ranged from approximately 390 ft above mean sea level (msl) upgradient of the Hornsby Bend East mine location to approximately 370 ft above msl downgradient (Figures 3-1 to 3-6).

Groundwater Quality

Water quality of the Colorado River Alluvial Aquifer in the vicinity of the Hornsby Bend East mine location was assessed by analyzing the groundwater for major-ions and nutrients. Major-ions were graphically evaluated to identify the typical water types present prior to mining, and a statistical evaluation of major-ions and nutrient concentrations in groundwater was performed to identify the typical range of values present during baseline conditions.

Major-ion chemistry data was used to construct trilinear (Hem, 1992) and Stiff diagrams (Stiff, 1951). The trilinear diagram (Figure 3-8) depicts the water composition as percentage milliequivalents per liter (meq/L) and shows that the Colorado River Alluvial Aquifer groundwater is predominantly indicative of calcium-bicarbonate type water. However, three wells have a calcium-bicarbonate/calcium-sulfate mixed type water and one well has a calcium-bicarbonate/sodium-bicarbonate mixed type water. Wells 5852314, ATF 1 and NTN 2, which are located on the down gradient side of the study area have calcium-bicarbonate/calcium-sulfate mixed type water. Wisian Well 2 is the furthest upgradient well in the study area and shows calcium-bicarbonate/sodium-bicarbonate mixed type water.

Stiff diagrams (Figure 3-9) depict water composition as concentrations of meq/l for each of the 6 samples collected from the 10 wells. The similarity of the six stiff patterns from a single well indicates that no substantial temporal changes in major-ion chemistry occurred during baseline monitoring. This temporal consistency in major-ion chemistry at each well is also demonstrated by the tight pattern of plotted data for each well on the trilinear diagram (Figure 3-8).

A statistical evaluation of the water quality constituents for all wells is presented in Table 4-2 and the minimum, maximum and mean for each well in Table 4-3. Water quality data from the Glass well collected during the first sampling event on October 18, 2011 was not included in the statistical evaluation because the Glass well results are not indicative of the actual water quality of the Colorado River Alluvial Aquifer. Rather, it is suspected that the relatively elevated water quality concentrations of the constituents in Glass well (Table 3-2), calcium, potassium, and bicarbonate in particular, are indicative of stagnant water in the well sump.

The statistics of the water quality constituents were used to estimate a range of values representative of baseline conditions. As expected, the mean concentration for most constituents at the majority of the wells did not vary considerably from the overall mean (Table 4-3). Therefore, the range of concentrations (minimum to maximum) for each water quality constituent on Table 4-2 is representative of the overall baseline condition.

Water Quality Threshold Levels

An indication that a change from baseline water quality has occurred could be gained by comparing newly observed water quality values to the range of baseline values shown on Table 4-3. However, just because a hypothetical future water quality value may exceed its baseline maximum value does not necessarily indicate a change to baseline conditions. Natural variation in the baseline range obviously exits. Therefore, an approach to identify values that exceed baseline conditions would be to identify levels greater than the maximum baseline concentration plus one standard deviation. Values of maximum concentration plus one standard deviation are presented on Table 4-2.

4.2 Task 2, Air Quality Evaluation

Valid 24-hour PM_{10} and $PM_{2.5}$ mass measurement results are given in Table 3-3. The average levels of PM_{10} were 19.1 µg/m^3 and 23.9 µg/m^3 at the north and south sites, respectively. These levels are slightly above the annual average PM_{10} level measured at 2600B Weberville Road, in East Austin, by TCEQ in 2011 (which was 18 µg/m^3). The differences between the PM_{10} levels measured at the test sites relative to the East Austin annual average might be due to the different sampling schedules (TCEQ collects 24-hour PM_{10} and $PM_{2.5}$ filter samples once every six days throughout the year) or they may reflect an impact from windblown dust at the test sites due to the dry and mostly barren agricultural land nearby.

The average levels of $PM_{2.5}$ were 9.3 µg/m^3 and 10.5 µg/m^3 at the north and south sites, respectively. These levels are slightly below the 10.9 µg/m^3 annual average that TCEQ measured at Webberville Road in 2011. These small differences may also be attributed to the different sampling schedules or, perhaps, to less vehicular traffic near the test sites than near the East Austin monitor location.

Air Quality Threshold Levels

The 24-hour National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$ and PM_{10} are 35 µg/m^3 and 150 µg/m^3, respectively (40 CFR Part 50). All observed baseline $PM_{2.5}$ and PM_{10} levels were well below the levels of the respective NAAQS, though federal regulations call for three years of year round monitoring, at least once every six days, for determining compliance with the NAAQS. $PM_{2.5}$ and PM_{10} levels above these NAAQS may lead to adverse health effects, and reduced visibility. The NAAQS can be used in subsequent phases of this project for comparison to observed $PM_{2.5}$ and PM_{10} levels to asses potential air quality impacts associated with sand and gravel mining operations.

4.3 Task 3, Noise Assessment Data Evaluation

Noise is generally defined as unwanted sound that is typically associated with human activity and which interferes with or disrupts normal activities. Sound becomes unwanted when it interferes with our normal activities such as sleeping, conversation, recreation, or when it causes adverse health effects. Sound is created when objects vibrate, resulting in a rapid variation in surrounding atmospheric pressure called sound pressure. Airborne sound is generally described in terms of the amplitude and frequency of variation of air pressure. The standard unit of measurement of the amplitude of sound is the decibel (dB). Decibels are measured on a logarithmic scale representing points on a sharply rising curve. For example, 10 dB are 10 times more intense than 1 dB, 20 dB are 100 times more intense, and 30 dB are 1,000 times more intense.

Most of the sounds that humans hear in the environment do not consist of a single frequency, but rather a broad range of sound frequencies, with each frequency differing in sound level. The sound energy in each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the fact that human hearing is less sensitive at low frequencies and extreme high frequencies than in the mid-range frequency. This method is called “A-weighting”, and the dB level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighted curve. Typical A-weighted levels measured in the environment and in industry are shown in Table 4-4 for different types of noise.

All sound pressure levels decrease as a function of distance from the source as a result of wave divergence, ground attenuation, and atmospheric absorption. As a sound wave travels away from the source, the sound energy is dispersed over a greater area, thereby dispersing the sound energy of the wave over an increasing area. Intervening topography can have a substantial effect on sound pressure levels with greater ground attenuation occurring over rough terrain verses flat terrain. For example, noise levels for a line source such as a busy highway decrease 3 dBA over hard ground (concrete, pavement) or 4.5 dBA over soft ground (grass) for every doubling of distance between the source and the receptor. Atmospheric absorption also influences sound levels; the greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Atmospheric turbulence and meteorological conditions such as wind and temperature gradients can also play a significant role in determining the degree of attenuation.

Noise levels from construction activities or ground transportation sources depend on a number of factors including equipment type, volume and speed.

The existing noise environment near the future mining activity areas is affected by a number of noise sources, most of which are transportation-related (i.e., roadway and aircraft). Primary noise sources observed within the project area include FM 969, local residential roadways, and aircraft overflight operations from ABIA. Other sources of noise contributing to local noise background levels included agricultural activities including plant nursery, tree farming, and pecan orchards located on and south of Milo Road as well as general community noise from nearby residential areas.

The existing ambient baseline sound-level measurements for each monitoring location are shown in Table 4-5. The table lists the equivalent, or steady state average noise level equivalent steady-state sound level (L_{eq}) during the respective monitoring period for each round of noise monitoring.

As shown in Table 4-5, equivalent A-weighted sound levels vary greatly depending on location. Existing daytime noise levels at residential areas located away from FM 969 (M1 through M4 and M7) generally vary from approximately 40 dBA to as high as 55 dBA. Monitored areas located next to the more heavily traveled FM 969 roadway (M5 and M6) are considerably higher varying from approximately 57 dBA to approximately 68 dBA.

A long-term (i.e., 4-hour) baseline noise measurement was also performed at the M1 measurement location. The noise measurement was conducted on a weekday, during the late afternoon hours. The resulting ambient noise level was 46.8 dBA which is very close (i.e., within 2 dBA) of the average of the short-term noise levels recorded at this same location.

Noise Threshold Levels

The project area is located within the Extra Territorial Jurisdiction (ETJ) of the City of Austin, therefore, the City of Austin noise ordinance applies. The City of Austin codifies noise regulations in several locations within its Code of Ordinances. Most references to noise concern music venues or the operation of sound equipment (loud speakers or public address systems) which do not apply to this project. However, some sections of the code may potentially apply to

TXI operations. In Chapter 9-2-3 – Noise and Amplified Sound, General Restrictions, Section 9-2-3(2) prohibits the "*making of noise audible to an adjacent business or residence between 10:30 PM and 7:00 AM*". Section 9-2-3(3) prohibits "*operation of a machine that separates, gathers, grades, loads, or unloads sand, rock, or gravel within 600 feet of a residence, church, hospital, hotel, or motel between 7:00 p.m. and 6:00 a.m.*".

Other sections within the Code of Ordinances prohibit certain noise levels and conditions within Planned Development Areas and Traditional Neighborhood Districts; however, at this time the surrounding residential areas do not qualify for these designations.

No standardized or regulatory criteria have been developed for specifically assessing construction noise impacts. Therefore, criteria must be developed on a project-specific basis unless local ordinances can be found to apply. Outside of work hour and distance requirements as shown above, the City of Austin noise ordinances do not specifically apply to construction noise levels within the project area and are therefore, not practical for assessing the noise impact of a construction project.

Project construction noise threshold levels should take into account existing noise levels, adjacent land use, and the duration of construction activities. The Federal Transit Administration (FTA) has developed general project construction noise criteria guidelines that can be considered reasonable criteria to be used in construction noise assessments. For general construction noise assessments, the eight-hour L_{eq} dBA noise criteria levels for various land use activity categories provided in Table 4-6 are often used.

Noise levels above these threshold criteria may lead to adverse community reaction, while noise levels below them generally require no action. The FTA noise criteria or other applicable construction noise criteria should be used in subsequent phases of this project to predict potential noise impacts associated with sand and gravel mining operations.

Table 4-1. Observed Groundwater Elevation Increase from October 2011 to May 2012

Well ID	Change in Groundwater Elevation (ft)
58522	+ 0.17
221049	+ 1.42
5852213	+ 1.88
5852314	+ 4.85
ATF Well 1	+ 1.75
Buchheit	+ 1.83
Holweger	+ 1.44
NTN Well 2	+ 3.49
Wisian Well 1	+ 0.85
Wisian Well 2	+ 0.67

ATF - Austin Tree Farm.
ft - feet, foot.
ID - Identification.
NTN - Native Texas Nursery.

Table 4-2. Overall Water Quality Statistics

Overall Statistic (all normal samples)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Ammonia (mg/L)	TSS (mg/L)	TDS (mg/L)
# of Samples	59	59	59	59	59	59	59	59	59	59	59	59	59
Mean	134	27.3	2.71	57.0	38.9	0.28	10.5	99.3	364	< 2	0.28	5.13	724
Range	149	66.6	4.21	95.4	89.4	0.32	34.7	399	285	< 2	6.33	72.7	709
Minimum	84	10.1	1.80	22.6	10.2	0.11	0.01	7.11	259	< 2	0.02	1.00	440
Maximum	233	76.7	6.01	118	99.6	0.43	34.7	406	544	< 2	6.35	73.7	1149
Standard Deviation	41	17.9	0.94	24.2	27.7	0.09	8.19	103	69.9	< 2	0.99	12.6	205
Mean + 1 Standard Deviation	175	45.2	3.63	81.2	66.6	0.37	18.7	202	433	< 2	1.27	17.7	929
Mean + 2 Standard Deviations	216	63.1	4.58	105	94.2	0.45	26.9	305	503	< 2	2.26	30.3	1134
Maximum + 1 Standard Deviation	274	94.6	6.95	142	127	0.52	42.9	509	614	< 2	7.34	86.3	1354

mg/L - Milligrams per liter.
TDS - Total dissolved solids.
TSS - Total suspended solids.

Table 4-3. Water Quality Statistics by Well

Well ID	Minimum/Maximum	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Ammonia (mg/L)	TSS (mg/L)	TDS (mg/L)
ATF 1	Minimum	194	41.2	3.48	43.2	65.2	0.14	4.86	143	461	< 2	0.02	1.00	967
	Mean	208	45.4	3.93	50.7	77.3	0.23	6.76	165	497	< 2	0.03	1.37	1050
	Maximum	222	47.3	4.49	57.4	83.6	0.36	8.91	184	544	< 2	0.07	2.30	1123
5852314	Minimum	134	36.8	1.98	79.4	52.2	0.17	10.3	187	349	< 2	0.02	1.10	871
	Mean	140	39.9	2.20	85.9	58.8	0.24	10.9	193	359	< 2	0.02	1.58	881
	Maximum	154	42.5	2.53	94.5	63.8	0.30	11.2	207	368	< 2	0.02	2.30	891
NTNW2	Minimum	175	56.5	2.24	41.7	35.6	0.20	24.3	266	336	< 2	0.02	1.00	965
	Mean	208	64.8	2.36	46.7	39.4	0.29	29.1	342	352	< 2	0.02	1.03	1052
	Maximum	233	76.7	2.51	52.6	44.9	0.42	34.7	406	382	< 2	0.03	1.10	1149
Holweger	Minimum	105	15.3	1.88	31.9	11.8	0.29	15.2	21.1	287	< 2	0.02	1.00	484
	Mean	111	17.0	1.97	40.0	21.1	0.33	18.0	27.3	302	< 2	0.02	1.07	522
	Maximum	117	19.7	2.03	45.2	32.6	0.43	21.6	34.1	314	< 2	0.02	1.10	556
5852213	Minimum	128	20.1	4.35	22.6	15.2	0.23	0.01	7.11	404	< 2	0.91	5.90	633
	Mean	137	22.2	4.80	27.4	18.9	0.31	0.05	21.9	449	< 2	2.58	31.7	682
	Maximum	150	24.8	6.01	31.9	27.8	0.39	0.10	37.4	527	< 2	6.35	73.7	759
221049	Minimum	92.7	10.9	1.80	25.8	10.2	0.18	12.9	14.9	267	< 2	0.02	2.90	440
	Mean	102	12.0	1.88	29.2	12.1	0.28	13.5	16.8	286	< 2	0.02	7.95	462
	Maximum	106	13.1	2.01	30.5	14.2	0.43	14.2	18.5	320	< 2	0.02	17.9	498
58522	Minimum	111	32.1	1.84	69.5	87.8	0.20	2.42	76.1	259	< 2	0.02	1.00	661
	Mean	119	34.8	2.04	72.4	91.8	0.26	3.40	78.9	346	< 2	0.02	2.03	747
	Maximum	124	37.5	2.23	75.2	99.6	0.32	4.27	81.3	382	< 2	0.02	3.80	784
Wisian W1	Minimum	86.6	10.1	2.61	53.9	12.7	0.24	8.03	21.2	300	< 2	0.02	1.00	493
	Mean	89.5	10.6	2.77	59.5	16.0	0.29	8.66	25.4	318	< 2	0.02	1.53	523
	Maximum	92.2	11.0	3.04	66.1	19.2	0.41	8.88	27.5	356	< 2	0.02	2.40	562
Wisian W2	Minimum	83.9	10.2	2.41	66.1	10.6	0.11	8.88	27.5	356	< 2	0.02	1.00	651
	Mean	91.6	11.2	2.51	110	12.8	0.13	11.0	31.72	413	< 2	0.02	1.30	675
	Maximum	99.4	12.2	2.72	118	15.3	0.14	12.5	36.2	455	< 2	0.02	1.80	710
Burchheit	Minimum	117	11.4	2.30	53.6	31.8	0.28	3.73	76.0	310	< 2	0.02	1.00	618
	Mean	126	12.5	2.44	57.0	36.7	0.36	4.19	80.2	324	< 2	0.02	1.05	641
	Maximum	139	13.0	2.59	61.5	39.9	0.39	4.70	85.2	363	< 2	0.05	1.20	678
All Wells	Overall Mean	134	27.3	2.71	57.0	38.9	0.28	10.5	99.4	364	< 2	0.28[1]	5.13	724

Note:
[1]Overall ammonia mean skewed by well 5852314, overall ammonia mean without 5852314 is 0.02.

ATF - Austin Tree Farm.
ID - Identification.
mg/L - Milligrams per liter.
NTN - Native Texas Nursery.
TDS - Total dissolved solids.
TSS - Total suspended solids.

Table 4-4. Range of Common Sound Levels on an A-Weighted Decibel Scale

Outdoor	dBA	Indoor
Jet takeoff at 200 feet/car Horn at 3 feet	120	Threshold of pain
Pneumatic hammer Gas lawn mower at 3 feet	100	Subway train
	90	Food blender at 3 feet
Downtown (large city)	80	Garbage disposal at 3 feet
Lawn mower at 100 feet	70	Vacuum cleaner at 10 feet Normal speech at 3 feet
Air conditioning unit Babbling brook	60	Clothes dryer at 3 feet Large business office
Quiet urban (daytime)	50	Dishwasher (next room)
Quiet urban (nighttime)	30	Recording studio
	0	Threshold of hearing

Source: FHWA, 1997.

Table 4-5. Summary of Daytime Ambient Noise Measurements

Site Location	Monitored Noise Level (dBA Leq)										
	Round 1						Round 2				
	10/26	10/27	10/28	10/31	11/2	11/3	3/22	3/23	3/28	3/29	3/30
M1	47.0	53.6	51.0	50.4	53.1	55.5	45.5	42.7	52.6	44.4	44.0
M2	43.8	48.2	51.0	41.2	44.8	53.5	49.4	49.7	44.2	45.8	44.5
M3	42.1	46.9	46.6	43.7	47.5	47.6	51.3	44.4	44.3	47.1	41.6
M4	48.3	48.6	50.5	43.6	48.8	49.3	50.4	44.3	48.2	43.3	42.5
M5	59.6	59.9	59.1	58.2	61.6	60.8	57.6	58.9	58.5	56.7	56.8
M6	66.1	62.7	65.2	65.8	65.8	62.3	67.1	64.1	67.2	68.3	63.8
M7	39.7	47.2	52.4	46.0	48.7	43.3	44.7	41.6	53.5	45.7	45.2

Table 4-6. Federal Transit Administration Construction Noise Criteria Guidelines

Land Use	Eight-hour Leq (dBA)	
	Day	Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: FHWA, 2006.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The following section presents the conclusions and recommendations of the baseline environmental monitoring for groundwater, air, and noise.

5.1 Conclusions

Groundwater

Baseline groundwater availability conditions of the Colorado River Alluvial Aquifer in the vicinity of the Hornsby Bend East and Hornsby Bend West mine location indicate that groundwater flow is to the south and southeast, with a typical potentiometric surface of approximately 390 ft above msl on the west to approximately 370 ft above msl on the east. Groundwater elevations in the area were rising as winter and spring 2012 precipitation recharged the aquifer after an abnormally dry summer and fall of 2011.

Typical groundwater at the site is calcium-bicarbonate type water. One upgradient well (Wisian Well 2) exhibited calcium-bicarbonate/sodium-bicarbonate mixed type water and three downgradient wells (5852314, ATF 1, and NTN 2) exhibited calcium-bicarbonate/calcium-sulfate mixed type water. Despite the presence of the mixed water types located on the up and downgradient ends of the site, the overall range of water quality constitutes is relatively consistent and appears representative of baseline water quality conditions. The minimum to maximum ranges of water quality constituents on Table 4-2 are indicative of baseline water quality conditions. The maximum water quality values plus one standard deviation can be used as a criteria to determine if baseline levels have been exceeded.

Air

$PM_{2.5}$ and PM_{10} levels from both locations averaged 9.8 µg/m^3 and 21.1 µg/m^3, respectively. These levels are consistent with the annual average $PM_{2.5}$ and PM_{10} level measured at 2600B Weberville Road, in East Austin, by TCEQ in 2011, which were 10.9 µg/m^3 and 18.0 µg/m^3, respectively. The small differences between the air quality levels measured at the test sites relative to the East Austin annual averages might be due to different sampling schedules or local effects such as windblown dust from dry agricultural land at the site (PM_{10}) and perhaps less $PM_{2.5}$ impact due to less vehicular traffic near the test site relative to the East Austin monitor location. All observed baseline $PM_{2.5}$ and PM_{10} levels were well below the NAAQS of 35µg/m^3 for $PM_{2.5}$ and 150 µg/m^3 for PM_{10}.

The $PM_{2.5}$ and PM_{10} air quality levels shown in Table 3-3 will serve as a comparison tool for future air quality levels during subsequent phases of the project to determine potential air impacts once mining operations begin.

Noise

Existing noise levels within the project area vary greatly depending on location with the highest noise levels occurring adjacent to FM 969 and Dunlap Road and lower noise levels occurring in the more rural sections of the project study area. Measured daytime noise levels within the study area are consistent with normal daytime noise levels for quiet urban and suburban areas of approximately 50 dBA as shown in Table 4-5.

The noise levels shown in Table 4-6 will serve as a comparison tool to future noise levels during subsequent phases of the project to determine potential noise impacts in adjacent residential areas once mining operations begin. Potential noise impacts should be determined based on future TXI mining activities, including proposed operations, schedules, and equipment to be used.

5.2 Recommendations

Groundwater
Prior to initiation of active mining operations at the Hornsby Bend East and Hornsby Bend West sites, it is recommended that groundwater levels be measured quarterly at the same 10 wells included in the baseline monitoring and that continuous water level monitoring at well 5852213 be continued. Groundwater sampling from the 10 wells should be performed annually until active mining commences. The water quality and groundwater availability data collected during this interim mining period should be used to update and or adjust baseline values. Once active mining starts it is recommended that water quality and groundwatetr availability monitoring be conducted quarterly.

Air
It is recommended that air quality sampling for $PM_{2.5}$ and PM_{10} from the same two locations used for the baseline sampling be performed quarterly for the first two years of active mining.

Noise
Prior to the start of future TXI mining activities, potential noise impacts associated with future mining activities should be determined at nearby off-property sensitive receptor locations. For best results, TXI operational parameters for the Hornsby Bend East and Hornsby Bend West sites should be well established. If noise impacts are predicted, then noise abatement measures should be considered. A noise abatement measure is any positive action taken to reduce the impact of noise on an activity area such as source controls (e.g., varying haul road paths), pathway controls (e.g., noise barrier walls, earthen berms, etc.), or receiver controls (e.g., acoustical land-use site planning concepts or acoustical construction techniques). Once active mining starts, it is recommended that noise monitoring be conducted semi-annually for the first year of mining.

6.0 REFERENCES

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http://www.txi.com/TXI-hornsby/hornsby-bend

APPENDIX A

Field Forms

TITLE CRCP- Well Survey

Project No.

Book No. A00801

From Page No. ____

8/10/11

0800 Arrive at site, meet w/ Mr. Ms. Glass, and S. England TXI.

0830 Arrive at well located behind Mr./Ms Glass mansion.

Well has a concrete cover w/ small opening to measure waterlevel. Well was a hand dug well - no pump in well.

DTW = 46.00' BTOC (not from top of concrete lid)

TD = ~~47.16~~' BTOC (" " " " " ")

46.99'= 46.72 + ~~0.26~~ 0.27' padlock length (used as weight on end of tape)

Coordinates = N 30° 14.080'

W 097° 34.277'

Elevation = 395.0 ft MSL

Outer diameter of casing = 2.8"

Thickness of casing = 0.22', Sampleport = 0.22' x 0.5'

0855 Arrive at Well # 5852203, located off of Dunlap Rd

DTW = Dry

TD = 20.66 + 0.27' = 20.93' BTOC

Coordinates = N 30° 13.649'

W 097° 34.457'

Elevation = 353.7 ft MSL

0925 Arrive at a presumed well with steel casing ~ 2" casing

0945 Arrive at Well # 5852213, located near Elm Creek; by barbed wire

DTW = 29.26' BTOC

TD = 36.38' BTOC

Coordinates = N30° 13.612' W 097° 33.846'

Elevation = 376.5 ft MSL

Yellow PVC casing, 5" casing, needs well cap

Access during mining - Safe way = Milo Rd (Mr. Carson's driveway)

Good candidate for installation of transducer.

1020 Arrive at buffer zone between Chapparal Crossing and the cemetery. Potential area to install air monitoring equipment.

1105 Arrive at Native Tree Nursery - Meet with Mr Bill Carson.

Gave permission to access/use 2 wells - Well # 35464 and another well not identified in database (installed between 1998-2000)

Said the wells are pumping ~~more~~ a majority of day

Sulfuric acid added before coming out of tap

To Page No. ____

Witnessed & Understood by me, [signature] Date 8/10/11

Invented by: Date

Project No.
Book No. A00801 TITLE CRCP - Well Survey

8/10/11 (cont.)

~40' bgs
Unidentified well at NTN - can collect GW before it gets acidified at the cistern. Need ladder
Well #35464 - physically tricky to obtain fresh GW. May need long pole w/ bucket
B. Carson also said there's another well located @ 15821 Milo (adjacent property) co-shared w/ Betty Wiseman
Also another well next to NTN office - not active
no electrical
~40' bgs (clay ~ @ 40' bgs)
top cover, equipment needs to be removed
said it has water
Possible to use office NTN well for gauging and one of pumping wells to sample.

Unidentified NTN well (drilled 3/26/98), ~~NTN well 1~~ (NTN well 2)
Coordinates: N 30° 13.453'
W 097° 33.585'
Elevation: 424.4 ft MSL

NTN Office well (NTN well 1)
Coordinates: N 30° 13.354'
W 097° 33.589'
Elevation: 371.3 ft MSL

Well #35464 -
Coordinates: N 30° 13.320'
W 097° 33.582'
Elevation: 385.8 ft MSL

Arrive at Rex Wimmer's well
DTW: 33.80' BTOC 6" diameter
TD: 43.54' BTOC Pump installed
Coordinates: N 30° 13.565'
W 097° 33.898'
Elevation: 410.7 ft MSL
Will need to bleed pressure equalizer tank, pump will kick on automatically. Like GW will bypass tank and flow straight out spigot.

To Page No.

Read and understood by me,	Date	Invented by:	Date
[signature]	8/10/11	Recorded by:	

8/10/11 (cont.)

1300 Arrive at Dale Holweger well
Coordinates: N 30° 13.582' TD ~ 48' (based on D. Holweger)
W 097° 34.184'
Elevation: 422.8 ft MSL
Nearby hand dug well (dry) - TD = 29.22' BTOC
Well is located ~ 200' beyond tree line behind house. Follow power lines to back
*Need thin water level meter for sample port
Can sample from spigot - need to remove hose first.

1345 Arrive at Mary Wisian well (2 wells)
Coordinates: N 30° 14.400' } (older well)
W 097° 34.093' }
Elevation: 428.9 ft MSL
Can sample from older well from faucet near pressure equalizer tank
Can sample from PVC pipe (6" dia) from new well - needs to be turned on manually. Need to call Mrs. Wisian to get electricity on for pump on new well and old well
Need wrench to unscrew sample port for WL gauging.
2 additional PVC wells in the grazing pasture
Well #1 (in grazing pasture)
DTW = 49.76' BTOC, 375.44 MSL
TD = 65.20' BTOC
Coordinates: N 30° 14.480'
W 097° 34.035'
Elevation: 425.2 ft MSL
9" Diameter w/ PVC cap
Well #2 (beyond brush line/fence)
DTW = 45.06' BTOC 375.84 MSL
TD = 62.14' BTOC
Coordinates: N 30° 14.485'
W 097° 34.122'
Elevation: 420.9 ft MSL
6" Diameter w/ PVC cap

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Book No. A00801 TITLE CRCP- Well Survey
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8/10/11 (cont.

1445 Arrive at Barb Buchheit well
Coordinates: N 30° 14.788'
W 097° 33.702'
Elevation: 403.4 ft MSL
Need thin WL meter to gauge through port
Can sample through spigot

1515 Arrive at Douglas Edgar well
Coordinates N 30° 14.608'
W 097° 33.729
Elevation: 300.5 ft MSL
Spigot right on top of well - gets GW right of well, turn on gently - will spray wat
Well house located behind house
DTW: 38.60' BTOC
TD: ~70' bgs (according to Doug Edgar)
Broke PVC pipe on well

1550 Arrive at Ally Bates and William Bates Well
Water not pumping at well. Likely due to broken pressure gauge Notified Ally Bates.

1625 Head back to office after attempt to access WSC well (northeast of mining region) failed
Kevin Pasternak wrote down contact info.

(KP)

To Page No.

ed & Understood by me, | Date 8/10/11 | Invented by: | Date
Recorded by:

Project No.
TITLE
Book No. A00801

From Page No.

10/14/11
@ 1425 YSI 556 MPS calibrated by N. Henry [signature]

	Pre-cal:	Post-cal:
pH 4	5.16	3.99 SU
pH 7	5.91	7.00 SU
Conductivity (1,413 μmhos)	0.895	1.413 mS/cm
ORP +229 mV (Zobell's) @ 25°C	255.4	229.1 mV
DO (Zero - 0.01mg/L)	2.25	0.01 mg/L

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Witnessed & Understood by me, | Date | Invented by: | Date

Recorded by:

TITLE CRCP - GW Monitoring | Project No. ______ | Book No. 00835

From Page No. ____

10/18/11
High 75°F, Windy

Purpose: Purge and sample: Wisian W1 well, Glass Well, 5852213, 5852~~2~~2314

Crew: Arthur Potts - Cox McLain
Kevin Pasternak, Kim Nguyen - URS Austin

Equipment: Twister Tempest submersible pump, WL meter, YSI water quality meter, tubing, LaMotte (ren turbidity meter, bailers

0830 Sign in at TXI Webberville site. Spoke with Jeff Roes Said can call in to sign-out. Do not access TXI thru Mil

0900 Meet Mary Wisian (Weezan) at her property. Calibrate LaMotte turbidity meter

Standard	Final
1 NTU	1.24 NTU
10 NTU	10.17 NTU

Set up on 8" diameter Wisian W1 well. Has white PVC outer casing (removable) to protect it. In the open field.

0954 Pump on at Wisian W1 well.

1010 Collect CRCP-WisianW1-010. Decon equipment.

1020 Collect equipment blank CRCP-WisianW1-015 using lab provided water. No TSS sample collected.

1040 Set up on Glass Well

1110 Begin bailing at 30" diameter Glass Well. Very little water in well and bailer not functioning properly. Silt gets caught up in ball valve. Needed to run bailer down multiple times to get enough volume for readings.

1120 Collect CRCP-Glass-010 after collect first reading.

1210 Set up on well 5852213. Note * need to cross Elm Branch (Creek?) slightly - then stop.

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Witnessed & Understood by me, | Date | Invented by: | Date

Recorded by:

Project No.
Book No. 00835 TITLE CRCP - GW Monitoring

Page No.

10/18/11 (cont.)

Well is on the left. White PVC pipe.
1250 Have some issues with WL meter. Need to replace battery (Prop black center out using pliers or flathead screwdriver).
1308 Pump on at 5852213 well.
1330 Collect CRCP-5852213-010. Decon equipment. Install transducer at ~ 2 ft above bottom.
1425 Arrive at Mansville Water Supply Company. Meet w/ technician (Richard). MWSC turns off pump. Allow water level to return to static.
1450 Turn on pump. Turn on spigot inside pump house. Allow water to pour/drain out of bucket. Collect readings every minute out of bucket.
1455 Collect CRCP-5852314-010. Decon equipment. Total volume purged (routed in separate path) = 3,340 gal.
1520 Jonas Rosenthal with Travis County arrives.
1600 Leave for LCRA lab. Hand delivery samples.

(KW)

To Page No.

Witnessed & Understood by me,	Date	Invented by:	Date
	10/18/11	Recorded by:	

TITLE CRCP-GW Monitoring

Project No. ______

Book No. 00835

From Page No. ____

10/19/11
High 75°F, Sunny

Purpose: Purge and sample 221049 well (Sarah King), Bucheit well, 58522 (Douglas Edgar), NTN Well 2, ATF Well 1, Holweger well

Equipment: YSI water quality meter (URS property), blue WL meter (URS property), thin tape WL meter (URS property), LaMotte turbidity meter (Ashtead rental), buckets, dedicated private pumps

Crew: Arthur Potts (Cox McLain)
Kim Nguyen, Kevin Pasternak (URS Austin)

0715 AP & KN leave from URS office for site. Purchase ice.
0755 Arrive at Sarah King's house - 221049 well.
Talk to Sarah King about her pressurized tank. Said it doesn't work. Pump kicks on everytime she turns on water. Water doesn't fill up tank. Since tank doesn't work. Good because URS doesn't need to drain tank before sampling. Use spigot on back of well house.
→ Spigot attached to a garden hose.
0826 Turn spigot on. Collect readings.
0840 Collect CRCP-221049-010 * WL was stable.
Note Do not run over cat when driving in/out of driveway.
0810 Calibrate LaMotte turbidity meter

Standard	Final
= 1 NTU	= 0.88 NTU
= 10 NTU	= 9.68 NTU

KP said YSI doesn't need to be calibrated
0900 Arthur and Randy Stephens (URS) goes to Wislan property to set up air monitoring equipment. KP helps set up.
0930 Set up on Bucheit well. Purge water from spigot.
0941 Turn spigot on. No hose.
1000 Collect CRCP-Bucheit-010

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Witnessed & Understood by me, [signature] | Date 10/18/11 | Invented by: | Date
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Book No. 00835 TITLE CRCP-GW Monitoring

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10/19/11 (Cont.)

1015 Jonas with Travis County meets URS at Exxon
1030 Set up on 58522 well (Douglas Edgar). Discuss with DE about drilling hole into cap to run WL meter down. Will need to plug hole with 3/4" plug.
1138 Spigot on at 58522 well. DE needs to turn power to pump on from the house. Run water through hose (belonging to DE)
1150 Collect CRCP-58522-010.
1200 Meet AP and RS at Native Tree Nursery (NTN) Check in with Emily Brown
1230 Measure DTW at NTN Well 1 (well by office).
DTW = 30.63' BTOC
TD = 36.16' BTOC
1235 ~~1635~~ Set up on NTN Well 2. Water discharges from outfall. Pump rate will vary based on level in pond. Move/Submerge "float" if need pump to start. Flow rate averaged by reading total volume (on meter inside pump housing) and dividing over time.
1249 Begin taking readings at NTN Well 2.
1255 Collect CRCP-NTNW2-010
1310 Arrive at Austin Tree Farm (ATF). KP discusses with AP and RS about potential air monitoring locations. Meet w/ manager of ATF - Dan
1340 Turn on pump. Need some time to allow water to reach. Hose was on spigot. Turn on spigot.
1355 Collect CRCP-ATF1-010.
1410 Set up on Holweger well. Can use large WL meter if unscrew pink top. Sample from spigot by unscrewing piping.
1448 Turn spigot on
1455 Collect CRCP-Holweger-010
1515 Conduct housekeeping. Complete COC.
1600 Delivery samples to LCRA lab (ELS)

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Witnessed & Understood by me, [signature] Date 10/19/11
Invented by: Date
Recorded by:

TLE Water Quality Meter Calibration Book No. 00835

om Page No. ____

11/28/11

Purpose: Calibrate YSI 556 WQM and Mettler Toledo pH meter prior to November 2011 GW Monitoring event.

Crew: Kim Nguyen (KN), Jen Woertz (JW)

1300 Mettle Toledo pH meter Calibration. JW allows use of meter for CRCP project.

Standard	Final Reading
pH = 4.0	= 4.00
= 7.0	= 7.03

YSI 556 Calibration.

Standard	
pH = 4.0	= 4.26 *
= 7.0	= 6.99 *
Sp Cond = 1.413 mS/cm	= 1.425 mS/cm

* pH meter on YSI doesn't function properly.

Note: Turbidity meter will be picked up from Ashtead tonight and will be calibrated tomorrow.

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tnessed & Understood by me,	Date	Invented by:	Date
[signature]	11/28/11	Recorded by:	

Project No. ______
Book No. 00835 TITLE CRCP-GW Monitoring

m Page No. ____

11/29/11
High 61°F, Sunny

Purpose: Download transducer data from Well 5852213, Purge + sample: Well 5852213, Wisian Well #1, ATF Well 1, Wisian Well #2, 58522 well, Deliver samples to LCRA lab

Crew: Kim Nguyen (KN), Kevin Pasternak (KP)
Arthur Potts (AP) - Cox McClain.

Equipment: YSI 556 WQM, blue WL meter, thin WL meter, LaMotte turbidity meter (Ashtead), Twister Tempest pump, dedicated tubing, Mettler Toledo pH meter, buckets, low flow controller

0730 Leave URS Office. Meet KP at Exxon. Purchase ice
0848 Sign in at TXI Weberville scale house (office was closed)
0915 Conduct H&S meeting. Discuss:
- Biological hazards - insects, mosquitoes, poison ivy near 5852213
- Lifting
- Traffic
- PPE
- Splash hazards
- Running over grass / cat with vehicle
0930 Calibrate LaMotte turbidity meter

Standard	Final Reading
1.0 NTU	0.85 NTU
10.0 NTU	9.47 NTU

0935 Set up on 5852213 (by creek)
0950 Pump on at 5852213
1010 Collect CRCP-5852213-020 Decon WL meter and pump
1040 Set up on Glass well
1100 Pump doesn't pump up water at Glass well due to low well volume (KN)

To Page No. ____

Witnessed & Understood by me, Date 11/29/11 Invented by: Date
Recorded by:

11/29/11 (cont.)

Not enough volume. KP said to not sample well. It isn't representative. Water column ~0.2' thick

1120 Set up on Wisian Well #1.
1139 Pump on at Wisian Well #1.
1200 Collect CRCP-WisianW1-020. Decon WL meter and pump.
1210 Collect CRCP-WisianW1-025 (Equipment Blank)
1230 Break for lunch
1300 Meet Dan Pacatte at Austin Tree Farm
1312 Pump on at ATF Well 1. Dan needs to turn on pump
1325 Collect CRCP-ATF1-020. Decon WL meter.
1345 Set up on Wisian Well #2
1402 Pump on at Wisian Well #2
1420 Collect CRCP-WisianW2-020. Decon WL meter and pump. Pack pump and tubing into trash ~~back~~ bag and label as Wisian Well 2.
1445 Set up on 58522 (Edgar well) well
1456 Pump on at 58522.
1510 Collect CRCP-58522-020. Decon WL meter. Conduct housekeeping. Move equipment into truck cab. Fill out C-O-C.
1550 Leave for LCRA lab.
1615 Drop off samples at lab.
1630 Return to Wisian property to unlock gate.
* Had accidently locked Wisian out of her property

(KW)

nessed & Understood by me,	Date	Invented by:	Date
[signature]	11/29/11	Recorded by:	

Project No. ______
Book No. 00835 TITLE CRCP-GW Monitoring
From Page No. ____

11/30/11
High 60's, Sunny

Purpose: Purge + sample 221049 well (Sarah King), NTN Well 2, ~~585277~~ 5852314 well, Holweger well, ~~Buec~~ Buchheit Well, Survey all wells.

Crew: Kim Nguyen (KN)
Arthur Potts (AP)

Equipment: WL meter (blue & thin tape), YSI 556 WQM, LaMotte turbidity meter, buckets, Mettler Toledo pH meter

0645 Leave URS Austin office for site
0730 Arrive at 221049 well (Sarah King property).
0735 Calibration check on turbidity meter

Standard	Measured ~~reo~~ value
0.0 NTU	= 0.56 NTU
1.0 NTU	= 1.14 NTU
10.0 NTU	= 12.6 NTU

0740 Undrill wall off of well house to access well. Set up.
0756 Pump on using URS garden hose
0815 Collect CRCP-221049-020 Decon WL meter
0830 Check in with Bill Carson at Native Tree Nursery.
0840 Set up on NTN Well 2 Could not turn pump on. Call Emily Brown. Emily meets crew. NTN had turned off the pump last night. Needed to flip the circuit breaker. AP needed to press float in pond (empty) in order to get water to flow out at spigot
0906 Pump on at NTN Well 2.
0930 Collect CRCP-NTNW2-020
CRCP-NTNW2-021 (Dup).
Decon WL meter. Kevin calls and asks to measure WL at NTN Well 1 (over by NTN office).
0935 Attempt to measure WL @ NTN Well 1. To Page No. ____

Witnessed & Understood by me, Date 11/30/11 Invented by: Date
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11/30/11 (cont)

WL meter (thin tape) not functioning. Replaced battery. Still not working. Water is visible on tape. Call Kevin to inform.

1000 Drive to Mansville WSC well - 5852314 well. Give to Kevin the WL meter (thin tape). He will try to fix it.

1015 Set up on 5852314 well.

1023 Pump on at 5852314 well.

1035 Collect CRCP-5852314-020 Decon WL meter.

1045 Call Kevin to check status on WL meter. He instructed to call Ashtead to see if they had one available in the Austin office. Ashtead was called - did not have one. Will use "wet" method to determine approx. WL (measure thickness of wetted tape).

1100 Break for lunch.

1120 Pick up WL meter back from Kevin. (who was working with the surveyors

1135 Set up Holweger well.

1149 Pump on Holweger well. Able to use blue standard WL meter at well.

~~1201~~ 1210 Collect CRCP-Holweger-023. Decon WL meter.

1300 Arrive at Buchheit (Buck-height) well. She could not meet until 1300.

Attempt to gauge using standard blue WL meter. Kevin tries to remove bits of the rubber gasket in portal. Attempt failed. Measure WL with thin WL meter. Back calculate WL by measuring TD and water column height.

1354 Pump on Buchheit well

1410 Collect CRCP-Buchheit-020. Decon WL meter.

1430 Drive to LCRA lab.

1500 Drop samples off at LCRA lab. Go to drop off equipment at URS office and at Ashtead (LaMotte Turbidity Meter).

(KN)

nessed & Understood by me,	Date	Invented by:	Date
[signature]	11/30/11	Recorded by:	

Project No. ______
Book No. 00835 TITLE Water Quality Meter Calibration

From Page No. ____

1/3/12

Purpose: Calibrate YSI 556 WQM and Mettler Toledo pH meter prior to January 2012 GW monitoring event.

Crew: Kim Nguyen (KN), ~~Ar~~

1055 Calibrate Mettler Toledo pH meter.

Standard	Final reading
pH = 7	= 7.03 @ 16.5°C
= 4	= 4.00 @ 16.8°C

1110 Calibrate YSI 556 WQ meter

Standard	Final reading
pH = 4	= 4.01
= 7	= 6.93

* pH meter on YSI doesn't usually function properly.

Conductivity = 1413 umhos/cm = 1.413 mS/cm

Note: LaMotte turbidity meter will be picked up from Ashtead tonight and will be calibrated tomorrow.

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Witnessed & Understood by me,	Date	Invented by:	Date
[signature]	1/3/12	Recorded by:	

1/4/12
Clear skies, High 65°F

Purpose: Purge + sample Well 5852213 (Download transducer data), Well 5852314, Wisian Well 1, Wisian Well 2, Drop off samples with lab, Collect equipment blank at Wisian Well 1

Equipment: YSI 556 WQ meter, LaMotte turbidity meter, submersible pump, dedicated tubing, low flow controller, blue WL meter, thin tape WL meter. Mettler Toledo pH meter

Crew: Kim Nguyen (KN) - URS Austin
Arthur Potts (AP) - Cox McLain

0730 KN arrives at URS to meet AP. Gathers equipment and supplies.

0800 Calibrate LaMotte turbidity meter

Cal Solution	Final Reading
Turb = 10 NTU	= 10.85 NTU
= 1 NTU	= 0.83 NTU

AP not yet showed up. Call CoxMcLain office and AP's cell phone 2x. AP had been made aware of the project. Office manager will try to contact AP's emergency numbers.

0930 AP arrives at URS. Load truck. Drive to LCRA lab to pickup coolers and sample containers. Call Richard Brown with Mansville WSC to notify of early arrival. Will meet Richard @ 1040.

1040 Set up on Mansville WSC well 5852314. Turn off well pump. Allow WL to stabilize to collect initial WL. Takes ~20 minutes for WL to stabilize

1059 Pump on at Well 5852314. Use garden hose to transmit water. pH meter acts up a bit on YSI. Use the Mettler Toledo pH meter. Midway thru, pH meter on YSI has more reasonable/comparable pH values

1115 Collect CRCP-5852314-0301 Decon WL meter To Page No. ____

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Book No. 00835 TITLE CRCP-GW Monitoring Jan 2012

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1/4/12 (Cont.)

1130 Check in at TXI Weberville Office. Call Joe Parks in advance to notify.
1145 Break to eat lunch. Mrs. Wisian will meet us at noon to open gate (keys to Wisian property were left at home).
1210 Set up on Wisian Well 2
1237 Pump on at Wisian Well 2. Purge using low flow
1250 Collect CRCP-WISIAN2-030. Decon pump + WL meter
1310 Randy w/ URS arrives to install solar panels on air monitoring equipment on Wisian property. AP stops to see if he needs assistance.
1325 Set up on Wisian Well 1. *Note* Before lowering pump into well, remove water level meter to prevent them getting tangled. There is enough cord/cable to lower the pump below a water table @ 50' BTOC. There is enough tubing as well, with ~2.5' left of clearance.
1339 Pump on at Wisian Well 1. Purge using low flow
~~1~~1355 Collect CRCP-WisianW1-030. Decon pump.
1410 Collect CRCP-WisianW1-035. Decon WL meter
1415 AP stops to check on air monitoring equipment on Wisian property.
1500 Set up on 5852213 well (TXI). Download transducer data.
1510 Pump on at 5852213. Notice that PVC cap on well was removed. Well exposed to ambient air
1525 Collect CRCP-5852213-030. Decon WL meter.
1555 Meet Randy at ATF air monitoring location. AP works w/ Randy on air monitoring
1610 Leave for LCRA lab
1630 Hand deliver samples to lab

(KN)

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Witnessed & Understood by me,	Date	Invented by:	Date
[signature]	1/4/12	Recorded by:	

LE CRCP - GW Monitoring Jan 2012 Project No. ______ Book No. 00835

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1/5/12
Clear skies, High 60's

Purpose: Purge + sample well 221049 (Sarah King), Holweger well, ATF Well 1, NTN Well 2, Buchheit well, Well 58522 (Edgar well)

Equipment: YSI 556 WQ meter, Mettler Toledo pH meter, LaMotte turbidity meter, blue WL meter, thin tape WL meter

Crew: Kim Nguyen (KN) - URS Austin
Arthur Potts (AP) - Cox McLain

0645 Meet at URS. Drive to well 221049 (Sarah King) well
0750 Set up on well 221049.
0811 Pump on at well 221049.
0830 Collect CRCP-221049-030. Decon thin tape WL meter.
0900 Purchase ice for cooler. Fuel up truck.
0915 Set up on ATF Well 1. Call Dan Pacatte to inform. He said ~~to~~ he will ask one of workers to turn on the pump because he will not be able to come
0929 Pump on at ATF Well 1.
0950 Collect CRCP-ATF1-030. Decon blue WL meter
1000 Measure DTW at NTN Well 1 (by office)
DTW = 29.36' BTOC
TD = 36.19' BTOC Decon thin tape WL meter.
1015 Set up on NTN Well 2. Emily Brown said that pump was turned off the day before to allow for WL to reach static levels. Just need to switch braker (labeled for pump) to "on" (three connected switches located on the left wall in pump house).
1021 Pump on at NTN Well 2
1040 Collect CRCP-NTN ~~Well~~ W2-030
CRCP-NTNW2-031 (DUP)
Decon blue WL meter.
1100 Break for lunch

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essed & Understood by me, Date 1/5/12 | Invented by: | Date
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Book No. 00835 TITLE CRCP-GW Monitoring Jan 20

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1/5/12 (cont.)

1115 Set up on Holweger well. Mr. Holweger wanted to know the exact nitrate levels of his groundwater. Travis County notified him of high levels and to not drink/cook with the water. KN told Mr. Holweger to request the final report through the Open Records Request when the report is submitted. He wanted to know the levels so he ~~&~~ can determine how to treat the water.
1126 Pump on Holweger ~~wee~~ (KN) well.
1145 Collect CRCP-Holweger-033 (MS/MSD). Decon WL meter
1150 Set up on Buchheit well.
1157 Pump on Buchheit well.
1215 Collect CRCP-Buchheit-030. Decon WL meter.
1225 Set up on 58522 well (Edgar)
1231 Pump on 58522 well.
1250 Collect CRCP-58522-030. Decon WL meter.
1300 Conduct housekeeping. Finish notetaking. Fill out COC.
1340 Hand deliver samples to lab. Drop off LaMotte.
1430 Unload equipment

(KN)

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Witnessed & Understood by me,	Date	Invented by:	Date
[signature]	1/5/12	Recorded by:	

Project No. 41010113.102
Book No. 00835 TITLE CRCP-GW Monitoring Feb 2012

From Page No. ——

2/15/12
High 72°F, Fog, Rain

Purpose: Purge + sample ATF Well 1, 5852213 (TXI well), WisianWell 1, Wisian Well 2, 58522 (Edgar), 221049 (King)

Equipment: Portable battery, submersible pump, dedicated tubing, blue WL meter, thin tape WL meter, YSI 556 WQM, Mettler Toledo pH meter, low-flow controller, LaMotte turbidity meter, buckets

Crew: Kim Nguyen (KN) - URS Austin
Arthur Potts (AP) - Cox McLain

0700 Meet at URS office. Load equipment and supplies. Go to LCRA lab to pick up coolers.
0840 Sign in at TXI Weberville plant.
0845 Meet Dan Pacatte at ATF Well 1. Kevin Pasternak is on site with Tom (Travis County) and Dr. Jack Sharp. Set up on ATF Well 1.
Calibrate LaMotte turbidity meter

Standard	Final Reading
= 1.0 NTU	= 0.97 NTU
= 10.0 NTU	= 9.98 NTU

0906 Pump on at ATF Well 1
0920 Collect [CRCP-ATF1-040] Decon WL meter
0935 Set up on 5852213 (TXI well). Download transducer data
1007 Pump on at 5852213. Conduct low flow purge
1020 Collect [CRCP-5852213-040] Decon WL meter + pum
1050 Set up on Wisian Well 1.
1105 Pump on at Wisian Well. Conduct low flow purge
1120 Collect [CRCP-WisianW1-040]. Decon WL meter + p
1135 Collect equipment blank [CRCP-WisianW1-045]
1145 Kevin, Tom, Jack head over to Glass Well to check on water level. DTW = 40.00' BTOC. KN and AP Set up on Wisian Well 2.
1159 Pump on Wisian Well 2. Conduct low flow purge.
1215 Collect [CRCP-WisianW2-040] Rinse pump

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[signature]	2/15/12	Recorded by:	

2/15/12 (cont.)

and decon WL meter.
1230 Break for lunch. Sign out at TX1.
1300 Set up at 58522 (Edgar).
1328 Pump on at 58522.
1350 Collect CRCP-58522-040 from spigot. Decon WL meter
Purchase add'l ice at Exxon.
1400 Set up at 221049 (Sarah King).
1419 Pump on at 221049.
1445 Collect CRCP-221049-040 from spigot. Decon WL meter.
Put up equipment. Fill out C-O-C.
1515 Hand deliver samples to LCRA ELS lab. Drive back to URS office.

(KM)

Witnessed & Understood by me, | Date 2/15/12 | Invented by: | Date
Recorded by:

8 Project No. 41010113.102
Book No. 00835 TITLE CRCP-GW Monitoring Feb 2012

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2/16/12
High 70s, P. Cloudy

Purpose: Purge + sample - Buchheit well, Holweger well, 5852314 (Mansville), NTN Well 2

Equipment: Dedicated private pumps, blue WL meter, thin tape WL meter, YSI 556 WQ meter, Mettler Toledo pH meter, LaMotte turbidity meter

Crew: Kim Nguyen (KN), Arthur Potts (AP)

0730 Meet at URS office. Leave for site. Purchase ice.
0815 Set up on Buchheit well.
0826 Pump on at Buchheit well.
0850 Collect CRCP-Buchheit-040. Decon WL meter.
0905 Set up on Holweger well. Holweger mentions that he has yet to receive the nitrate results. Will pass info along to Kevin Pasternak.
0916 Pump on Holweger well
0935 Collect CRCP-Holweger-043 (MS/MSD). Decon WL meter.
0950 Set up on 5852314 well (Mansville WSC). Richard Brown says that they may adjust pump intake depth or replace screen in the future due to previous issues in late January/early February when pump had pumped out dry air.
1003 Pump on 5852314 well
1020 Collect CRCP-5852314-040. Decon WL meter
1050 Break for lunch.
1105 Set up on NTN wells. Gauge NTN Well 1 (by the office. DTW = 28.15' BTOC
1110 Blue WL meter not functioning properly at ~~NTN~~ NTN Well 2. AP says we have had problems with the meter at the well. The pump was on when we arrived, however, it wasn't actively pumping since the pond was still full.
1122 Pump on at NTN Well 2

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Witnessed & Understood by me,	Date	Invented by:	Date
[signature]	2/16/12	Recorded by:	

2/16/12 (cont.)

1145 Collect CRCP-NTNW2-040 and CRCP-NTNW2-041 (DUP)
Decon WL meter and other equipment. Pack up equipment. Fill out C-O-C.
1220 Hand deliver samples to LCRA ELS lab. Drop off turbidity meter at Ashtead. Unload equipment at URS office.

KN

nessed & Understood by me,	Date	Invented by:	Date
[signature]	2/16/12	Recorded by:	

Project No. 41010113.102
Book No. 00835 TITLE CRCP - GW Monitoring March 2012

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3/23/12

Purpose: Calibrate YSI 556 Water Quality Meter (WQM) and pH Mettler Toledo meter.

0945 Calibrate Mettler Toledo in the Solid Waste lab (Building D).

Standard	Final
pH = 4.0	= 4.00
= 7.0	= 7.03

1010 Calibrate YSI WQM.

Standard	Final
pH = 4	= 3.98
= 7	= 6.98
Sp. Cond = 1.413 mS/cm	= 1.413 mS/cm
ORP = 220 mV	= 197.3 mV @ 16°C
DO = 100% Saturation	= 96.5% at 17.70°C, 767.0 mmHg

* Have issues w/ pH meter. Calibration is out of range. Will use pH Mettler Toledo for pH measurements

* Turbidity meter will be calibrated on the first day of the field event.

(KN)

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Witnessed & Understood by me, [signature] Date 3/23/12
Invented by: Date
Recorded by:

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3/26/12
High 84°F, Sunny

Purpose: Purge and sample - Wisian Well 1, Wisian Well 2, 5852213 (TXI), 5852314 (Mansville), Buchheit well

Equipment: Submersible pump, dedicated tubing, YSI 556 WQM, LaMotte turbidity meter, blue WL meter, thin tape water level meter

Crew: Kim Nguyen (KN) - URS, Arthur Potts (AP) - CoxMcLain

0700 Meet at URS office. Load equipment. Go pick up coolers at LCRA lab.
0820 Attempt to check in at TXI Webberville. Accident on 969 prevents access. AP collects air sample at Wisian.
0900 Set up on Wisian Well 2.
0914 Pump on Wisian Well 2. Conduct low flow.
0935 Collect CRCP-WisianW2-050. Decon WL meter/pum
0945 Set up on Wisian Well 1. Conduct low flow.
0958 Pump on Wisian Well 1.
1020 Collect CRCP-WisianW1-050. Decon WL meter/pump
1035 Collect CRCP-WisianW1-055 (EB)
1050 Go check in at TXI Webberville office. Get ice. Break for lunch.
1130 ~~1155~~ (KN) Set up on 5852213. Poison ivy is everywhere!
~~1155~~ (KN) Download transduce data
1155 Pump on at 5852213
1210 Collect CRCP-5852213-050 Decon WL meter/pump
1230 AP collects air samples at ATF.
1250 Wait for Richard at 5852314 well.
1315 Set up on 5852314 (Mansville)
1333 Pump on at 5852314. Purge sand/water. Then water clears up.
1350 Collect CRCP-5852314-050. Decon WL meter.
1410 Take break. Next appt is at 1500 @ Buchheit well.
1430 Set up on Buchheit well.

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Witnessed & Understood by me,	Date	Invented by:	Date
[signature]	3/26/12	Recorded by:	

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Book No. 00835 TITLE CRCP-GW Monitoring March 2012

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3/26/12 (cont.)

1459 Pump on at Buchhert well
1520 Collect CRCP-Buchhert-050 / Decon WL meter
1543 Drop off samples at LCRA lab.

(KW)

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nessed & Understood by me,	Date	Invented by:	Date
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Project No. 41010113.102

TITLE CRCP-GW Monitoring-March 2012 Book No. 00835

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3/27/12
High 83°F, Sunny

Purpose: Purge + sample - ATF Well 1, NTN Well 2, Holweger well, 58522 (Edgar),

Equipment: Thin tape WL meter, private pumps, YSI 556 WQM, LaMotte turbidity meter

Crew: Arthur Potts (AP) CoxMcLain
Kim Nguyen (KN) - URS

0800 Meet at URS. Head to ATF.
0900 Set up on ATF Well 1
0922 Pump on at ATF Well 1
0940 Collect CRCP-ATF1-050. Decon WL meter.
0950 Set up on NTN Well 1. Measure WL = 27.60' BTOC
1000 Set up on NTN Well 2.
1008 Pump on at NTN Well 2.
1025 Collect CRCP-NTNW2-050
CRCP-NTNW2-051 (DUP) Decon WL meter.
1040 Set up on Holweger well.
1053 Pump on Holweger well.
1115 Collect CRCP-Holweger-053. Decon WL meter.
1130 Take lunch break
1215 Set up on 58522 (Edgar)
1223 Pump on 58522 well.
1255 Collect CRCP-58522-050 / Decon WL meter.
1305 Set up on 221049 well.
1305 Pump on 221049 well
1330 Collect CRCP-221049-050. Decon WL meter.
1345 Load equipment
1400 Hand deliver samples to LCRA lab.
1445 Unload equipment at URS office.

(KN)

To Page No. ____

Witnessed & Understood by me,	Date	Invented by:	Date
[signature]	3/27/12	Recorded by:	

Project No. 41010113.102
Book No. 00835 TITLE CRCP GW Monitoring - May 2012

From Page No. ___

5/4/12

Purpose: Calibrate YSI and Mottler Toledo pH meter.

1000 Calibrate Mottler Toledo pH meter

Standard	Final
pH = 4.0	= 4.00
= 7.0	= 7.03

Calibrate YSI (pH not functioning properly on YSI)

Standard	
Sp. Cond = 1.413 mS/cm	= 1.413 mS/cm
ORP = 220 mV	= 203.4 mV @ 18.00°C (ORP check only)
DO = 95%	= 99.1% @ 18.00°C

(KN)

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Witnessed & Understood by me, [signature] Date 5/4/12

Invented by: Date

Recorded by: