Revised Addendum

Background Groundwater Quality Report: New Wells For Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah

Prepared for:

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April 30, 2008

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April 29, 2008

VIA FEDERAL EXPRESS

Dane L. Finerfrock, Co-Executive Secretary
Utah Water Quality Board
Utah Department of Environmental Quality
168 North 1950 West
P.O. Box 144810
Salt Lake City, UT 84114-4810

Dear Mr. Finerfrock:

Re: State of Utah Ground Water Discharge Permit No. UW370004 (the "GWDP") White Mesa Uranium Mill – Revised Background Groundwater Quality Report for New Wells

We are submitting this report on behalf of Denison Mines (USA) Corp. Reference is made to the *Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County*, October 2007 prepared by INTERA Inc. (the "Background Report"), pursuant to Part I.H.3 of the White Mesa Mill's GWDP, and filed with the Executive Secretary under cover of a letter dated October 26, 2007.

Reference is also made to your letter of February 11, 2008, in which you set out the findings of your completeness review of the Background Groundwater Quality Report for New Wells. In your letter you request Denison to address the findings of this review, and revise and resubmit the Background Groundwater Quality Report for New Wells accordingly.

Please find enclosed two copies of the Revised Background Groundwater Quality Report for New Wells, prepared by INTERA Inc., which addresses the findings of your review.

Specifically, we have responded to the findings, as stated in your letter, as follows (your findings are indicated below in bold italics, followed by our response):

Findings 1 and 2.

1.) It appears the Background Groundwater Quality Report for New Wells was not written in conformity with EPA Guidance - for data preparation and statistical analysis of groundwater quality data, including treatment of non-detectable values, statistical methods, etc. Please revise the Background Groundwater Report for New Wells using the following EPA guidance:

- **February, 1989, "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities Interim Final Guidance", U.S. Environmental Protection Agency, Office of Solid Waste, 530-SW-89-026, and**

- **July, 1992, "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities Addendum to Interim Final Guidance", U.S. Environmental Protection Agency, Office of Solid Waste.**

Both of these EPA guidance documents were provided you in an August 9, 2007 DRC email.

2.) Section 2.0 of the <u>Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Guidance</u> provides methods for handling non-detects in statistical analyses based on the proportion of non-detects in a data set. Please perform statistical analyses of the groundwater data again, using this guidance as a framework to handle the non-detects.

These guidance documents were used in the revised Background Groundwater Quality Report for New Wells. Please note that the results of statistical calculations presented in Tables 2a and 2b were completed by substituting one half of the detection limit for all cases of non-detect values. The underlying purpose of statistical results presented in those Tables was to provide an initial exploration of a large database and focus attention on features that required closer examination. All results presented in those Tables were not necessarily intended to be used in calculating proposed GWCLs, although they were used to calculate proposed GWCLs for those data sets that included fewer than fifteen percent non-detect values.

Statistical parameters used to calculate GWCLs were determined as follows, per EPA guidance (EPA, 1992 and 2000). After preparation of the database as described in Section 4 of the Report and illustrated by the flow sheet included as Figure 17 (the “Flow Sheet”), the data sets were divided into four separate groups, based on the percentage of non-detect values included in each set:

- data sets with 15 percent or fewer non-detect values,
- data sets with more than 15 and up to 50 percent non-detect values,
- data sets with more than 50 and up to 90 percent non-detect values, and
- data sets with more than 90 percent non-detect values.

If less than 15 percent of all sample values in a data set were non-detect, each non-detect value was replaced by one half of its detection or quantitation limit and the data set was tested for normality or log normality. Data sets that failed tests for normality were flagged for non-parametric analysis and, as stated above, normal or log normal data sets were then analyzed by standard parametric methods to determine the appropriate mean and standard deviation used to calculate a GWCL. These data sets were screened for trends using least squares regression with the p-value for significance set at 0.05.

After testing for normality or log normality and flagging data sets that failed these tests for non-parametric analysis, Cohen's or Aitchison's Method were used to calculate a mean and standard deviation for data sets where non-detect values were more than 15 and up to 50 percent of the total set. Because of the relatively high number of non-detect values that occur within this group, screening for trends was conducted using both least squares regression and the Mann-Kendal test. If either screening method indicated a positive trend (or a negative trend in the case of pH) then the data set was flagged for further evaluation.

For data sets with more than 50 and up to 90 percent non-detect values and data sets that failed tests for normality or log normality, the mean and standard deviation are not considered to be representative of the data set and non-parametric methods were used instead. EPA Guidance (1992) and the Flow Sheet require that the most appropriate statistic for purposes of calculating GWCLs is the highest historical value for the constituent. As a result, the highest historical value, after screening the data as set out in Section 5.0 of the Report, has been identified and is indicated where applicable on Table 10 of the Report. Screening for trends was conducted using the Mann-Kendal test. If a positive trend was indicated (or a negative trend in the case of pH) then the data set was flagged for further evaluation.

Finally, for data sets that had greater than 90 percent non-detects, EPA Guidance (1992) and the Flow Sheet require that the most appropriate statistic for purposes of calculating GWCLs is the Poisson limit. As a result, the Poisson limit has been calculated and is indicated where applicable on Table 10.

Finding 3.

Please add a Flow Chart and accompanying explanatory text (as numbered or bulleted items) presenting each step in the data validation and statistical analysis process. The Flow Chart presented as Figure 19 of the October 26, 2007 Revised Background Report would be appropriate to use, however it needs to be revised to reflect the DRC August 24, 2007 Conditional Approval. Please note these are editorial changes and do not change the process. After revision of the Flow Chart, please follow it to calculate groundwater protection standards for each new well and each constituent listed in Table 2 of the Permit.

A Flow Sheet has been included as Figure 17.

Finding 4.

In Section 2.22 of the Background Groundwater Report for New Wells, DUSA removed the extreme value of 2.78 µg/L from the cadmium data set in MW-25, leaving seven data points for statistical analysis. Following the Flow Chart requirements referenced above, if there is not at least 8 data points remaining for analysis, DUSA should "*Defer analysis until eight data points are available*." Please ensure that all wells and parameters considered by the report include eight or more samples in the statistical analysis.

Only data sets with at least 8 data points were used in the revised report.

Finding 5.

Please add a summary table providing the mean and standard deviation values DUSA proposes to use to establish the GWCL for each well and each constituent listed in Table 2 of the Permit (similar to Table 16 of the October 26, 2007 Revised Background Report). This summary table must also include a column listing the distribution selected (e.g., normal, lognormal, or non-parametric) and a comment/rationale column to identify those constituents where a mean and standard deviation are not appropriate to establish the GWCL. For these occurrences, please provide an alternative GWCL with brief justification. This summary table will streamline modification of the Permit GWCLs and will focus subsequent efforts on evaluating those constituents where statistical measures may not be appropriate for establishing compliance limits.

Please see Table 10 of the revised Report, which presents the results of GWCL calculations based on the Flow Sheet.

Finding 6.

Please provide electronic copies on CD of the input and output files for all Statistica software runs.

Electronic copies of all Statistica input and output files are included on the CD accompanying this report as Appendix F.

Finding 7.

For constituents identified as having a log normal distribution in the summary statistics (Tables 2A and 2B), please provide the geometric standard deviation.

The geometric mean and standard deviation for all normal or lognormal constituents is presented in Table 4.

Finding 8.

Please add a footnote to the "Result" column in Table 10, which reads: "If the result was non-detect, the value listed here is one-half of the reporting or detection limit.

A footnote has been added to Appendix E, which has replaced the Table 10 mentioned in the finding above.

Finding 9.

Please provide citation/documentation for the applicability of methods and the selection of values/criteria used in the statistical analysis (e.g., regression coefficient of 0.5 for trend analysis, number of sample ≥ 20 for Shapiro-Wilk test, p-value of 0.05 for Shapiro-Wilk test significance, +/- 3 times the height of the box-and-whisker plot box for extreme values, etc…).

Using a regression coefficient (R^2) of 0.5 to divide "good" correlations from "poor" correlations is merely a rule of thumb, and was not used in statistical analysis.

While we generally followed EPA guidance in *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities* (EPA, 1989 and 1992), there were specific instances where clear guidance was not available in those documents or, for that matter, in any EPA Guidance document. For example, the following quotes from EPA (1992) appear to contradict the quotation from EPA (2002) presented in response to Finding 8, above:

> *"The Shapiro-Wilk test of Normality can be used for sample sizes up to 50." And "The [Shapiro-Wilk W] coefficients can be found for any sample size from 3 up to 50 in Table A-1 of Appendix A."*

However, all statistical procedures require judgment in selecting tests and criteria to return meaningful results. Thus, while we note *"For the Shapiro-Wilk test to have sufficient power to reject hypothesis of normality (or log normality), the sample number, or "n" should be at least 20"*, we applied the test to all data sets that had fewer than 50 percent non-detects, including those with less than 20 data points.

As noted, we chose a p-value of 0.05 for the Shapiro-Wilk test. To determine whether to reject the null hypothesis of normality, it is necessary to examine the probability associated with the test statistic (i.e., p-value). If this value is less than the level of significance you choose (such as 0.05 for 95%), then the null hypothesis is rejected, and you can conclude that the data do not come from a normal distribution. This level was chosen as reasonable (commonly used) and more appropriate than a higher value (i.e., 0.1) because it would identify more data sets as normal. A normal distribution allows the use of parametric statistics which is more powerful than the non-parametric approach used for those data sets testing non-normal.

The size of the box in box and whisker plots was set such that the height of the box (H) represents the 25th (LBV) and 75th (UBV) percentile range of the data set with the median value plotted within. This range is similar to that described by one standard deviation for normally distributed data. Extreme values were identified as being more than 3 times above or below the width of the box. This is roughly equivalent to values that are four standard deviations above or below the mean in normally distributed data, or above or below 99.994% of all other data.

The following quote is from U.S. EPA, 2002, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, EPA 540-R-01-003 OSWER 9285.7-41 September 2002, Office of Emergency and Remedial Response U.S. Environmental Protection Agency, Washington, DC 20460

> *"Tests for the distribution of the data (such as the Shapiro-Wilk test for normality) often fail if there are insufficient data, if the data contain multiple populations, or if there is a high proportion of non-detects in the sample.[6] Tests for normality lack statistical power for small sample sizes. In this context, — "small" may be defined roughly as less than 20 samples, either on site or in background areas. Some standard tests for a particular distribution against all alternatives, such as the Lilliefors form of the Kolmogorov-Smirnoff test, require as many as 50 samples. Therefore, for small sample sizes or when the distribution cannot be determined, non-parametric tests should be used to avoid incorrectly assuming the data are normally distributed when there is not enough information to test this assumption."*

Finding 10.

It appears that DUSA has run statistical analysis for VOCs. As stated in R317-6-1.2 in the Administrative Rules for Ground Water Quality Protection, *"Background Concentration" means the concentration of a pollutant in ground water upgradient or lateral hydraulically equivalent point from a facility, practice or activity which has not been affected by that facility or activity."* As stated in Part I.H.3(d), *"Upon approval of this report, the Executive Secretary will re-open this Permit and modify the Ground Water Compliance Limits in Table 2, above to account for natural variations in groundwater quality, not caused by current or historic operations at the facility."* VOCs such as chloroform and THF are man-made contaminants and therefore are unlikely to occur in the shallow aquifer at the site. Therefore, it is not appropriate to set GWCLs that are higher than the corresponding GWQS for constituents where contamination was caused by or related to activities conducted by the Permittee. Therefore, all GWCLs for VOCs should be set according to the fractions approach pursuant to Utah Administrative Code R317-6-4.5 and R317-6-4.6. Alternatively, DUSA may provide additional ground water quality date from upgradient locations, beyond the area of influence of the facility's wildlife ponds, to affirmatively demonstrate that VOC's in question are the result of some other anthropogenic source, and not historic milling activities.

Statistical analyses for VOCs were run for consistency and exploratory purposes. Proposed GWCL for VOCs presented in Table 10 are the fractional GWCLs from the GWDP.

Finding 11.

Table 10 shows the extreme values that were flagged and removed from statistical analysis. Please add a column explaining/justifying why these values were removed prior to analysis.

A column has been added to Appendix E which has replaced Table 10 mentioned in the finding above. This column describes why the data were removed prior top statistical analysis.

Finding 12.

In Section 6.13 of the Report DUSA, states that the order of samples collected during the 4th Quarter, 2005 monitoring event was "*MW-25, MW-28, MW-27, MW-31, MW-30, MW-29, MW-3A, MW-3A, MW-23, MW-24, and finally the field blank. Therefore, given this sampling order, and given the fact the tetrahydrofuran was found in the field blank and rinsate samples, DUSA determined that it is unlikely detection of tetrahydrofuran in these wells represented tetrahydrofuran contamination in these wells, but rather represented cross contamination during sampling.*" However the 4th Quarter 2005 Groundwater Monitoring Report shows the sampling order as follows:

December 2005 (4th QTR) Sampling Event			
Date	**Time Purged or Collected**	**Sample**	**THF**
12-Dec-05	13:40	MW-60 (FB)	11 µg/L
12-Dec-05	14:00	MW-65 (ERB)	27 µg/L
13-Dec-05	7:50	MW-3	13 µg/L
13-Dec-05	Purged Dry from 8:08- 8:11	MW-3A	
13-Dec-05	8:43	MW-17	
13-Dec-05	9:33	MW-25	
13-Dec-05	10:07	MW-11	
13-Dec-05	10:07	MW-63 (BD of MW-11)	
13-Dec-05	10:39	MW-14	
13-Dec-05	12:14	MW-15	
13-Dec-05	12:44	MW-5	13 µg/L
13-Dec-05	13:05	MW-12	12 µg/L
13-Dec-05	Purged Dry from 13:20-13:29	MW-23	
13-Dec-05	Purged Dry from 13:36-13:41	MW-24	
13-Dec-05	15:09	MW-19	
14-Dec-05	8:02	MW-1	58 µg/L
14-Dec-05	9:01	MW-18	
14-Dec-05	9:20	MW-26	55 µg/L
14-Dec-05	9:56	MW-28	
14-Dec-05	10:20	MW-2	
14-Dec-05	11:05	MW-27	
14-Dec-05	12:27	MW-32	
14-Dec-05	13:10	MW-31	
14-Dec-05	13:51	MW-30	
14-Dec-05	14:11	MW-29	
14-Dec-05	15:00	MW-3A	5 µg/L
14-Dec-05	15:20	MW-23	6 µg/L
14-Dec-05	15:40	MW-24	7.4 µg/L
14-Dec-05		Trip Blank	

Table Notes
FB = Field Blank
ERB - Equipment Rinsate Blank
BD = Blind Duplicate
Blank cell = Non Detect
Highlighted = Received by analytical laboratory on December 15, 2005
Not highlighted = Received by analytical laboratory on December 16, 2005

As the table shows above, the field blank (MW-60) and the equipment rinsate blank (MW-65) were collected before any other field samples. In addition MW-60, MW-65 and the other samples highlighted were received by the analytical laboratory (Energy Laboratories - Casper) on December 15, 2005. The new wells with tetrahydrofuran (hereafter THF) detections (MW-3A, MW-23, and MW-24) were received by the analytical laboratory on December 16, 2006. Therefore, there is no relation to the THF detections in the field blank and equipment rinsate blank and the THF concentrations found in the new wells (MW-3A, MW-23, and MW-24). Furthermore, the Energy Laboratories Trip Blank included in the cooler with the new wells samples (MW-3A, MW-23, and MW-24) was found to be non-detect for all VOC constituents. Therefore, it appears that the THF concentrations found in the new wells during the 4th Quarter 2005 monitoring event mostly likely represents THF contamination in the new wells.

The table showing sample collection times above is correct; however the purge order of the sampling event differs due to pumping a few wells dry. These wells and their associated purge times have been added to the table above and are shown in blue. Both the purge and sample order in relation to THF detections are relevant because the detections of THF in New Wells are in wells that were purged immediately after existing wells that are known to have THF contamination. Thus, given the fact that there have not been repeated occurrences of THF in those new wells, the likelihood of cross contamination resulting from this sampling/purging order is high. The likelihood of cross contamination is also supported by the fact that THF concentrations were detected in the DI blank and the equipment rinsate sample prior to any purging or sampling. This suggests that proper field QC procedures may not have been followed, resulting in improperly cleaned equipment (as evidenced by the rinsate blank) and/or cross contamination with something in the lab at the Mill (as evidenced by the DI blank and possibly the rinsate blank, which used DI water from the Mill's lab). Laboratory trip blanks are DI water in containers provided by the laboratory. The laboratory trip blanks are never opened, and therefore we would not expect that a laboratory trip blank would be subject to the cross contamination that the rest of the samples may be subject to. Based on the results to date, and given the circumstances surrounding the sampling events, we do not believe there is THF contamination in MW-3A, MW-23, and MW-24. There have only been detections in Wells 23 and 24 one time, and those detections were in circumstances where there is a high likelihood of cross contamination, and those wells have not had any detections in the four quarters since. There have been two detections in far downgradient MW-3A, once in December of 2005 (which is subject to the same cross contamination issues as MW-23 and 24 for that sampling event) and once in June of 2006. All other samples from MW-3A have not had any detectable THF concentrations. The detected concentrations of THF in the New Wells are well below the GWDP GWQS and GWCLs. Denison will continue to monitor this situation closely.

If you have any questions regarding the foregoing, or require any further information, please contact David Frydenlund at 303-389-4130 or Steve Landau at 303-389-4132.

Sincerely,

Daniel W. Erskine, PhD
INTERA, Inc.

cc: Ron F. Hochstein
Harold R. Roberts
David C. Frydenlund
Steven D. Landau
David E. Turk

REFERENCES

Denison Mines (USA) Corp. (DMC) 2006. *Background Groundwater Quality Report: Existing Wells.* Prepared for Denison Mines (USA) Corp., Denver, CO. December 2006.

Denison Mines (USA) Corp. (DMC) 2007. *Addendum, Evaluation of Available Pre-Operational and Regional Background Data.* Prepared for Denison Mines (USA) Corp., Denver, CO. April 19, 2007.

U.S. Environmental Protection Agency (U.S. EPA) 1992. *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Guidance.* Office of Solid Waste, Washington, D.C. July 1992.

U.S. Environmental Protection Agency (U.S. EPA) 2002. *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites.* Office of Emergency and Remedial Response U.S. Environmental Protection Agency Washington, DC 20460, September 2002.

StatSoft, Inc, 2005,. STATISTICA (data analysis software system), version 7.1. www.statsoft.com.

EXECUTIVE SUMMARY

Denison Mines (USA) Corp.'s (DUSA's) White Mesa Uranium Mill (Mill) is located approximately 6 miles south of Blanding, Utah. Licensed by the U.S. Nuclear Regulatory Commission (NRC) in 1980, the Mill has processed over 4 million tons of conventionally mined and alternate feed uranium ores for the recovery of over 25 million pounds of U_3O_8 and 34 million pounds of vanadium to date.

In August 2004, Utah became an Agreement State for uranium mills and, as a result, became the primary regulator of the Mill. In March 2005, the Utah Department of Environmental Quality (UDEQ) issued Groundwater Discharge Permit No. UGW370004 (GWDP) for the Mill, which is intended to tailor the state's groundwater protection program to the Mill facility and establish groundwater quality monitoring parameters for the Mill.

At the time of issuance of the GWDP, there were thirteen groundwater monitoring wells (MWs) at the site that were incorporated into the groundwater monitoring system under the GWDP. These are wells MW-1, MW-2, MW-3, MW-5, MW-11, MW-12, MW-14, MW-15, MW-17, MW-18, MW-19, MW-26 and MW-32 (the existing wells). As required under Part I.H.1 of the GWDP, DUSA installed nine new monitoring wells in the first quarter of 2005. These are wells MW-3A, MW-23, MW-24, MW-25, MW-27, MW-28, MW-29, MW-30 and MW-31 (the new wells). All GWDP monitoring wells are screened in a zone of perched groundwater in the Burro Canyon Formation which is the uppermost occurrence of groundwater beneath the site. See Figure 1 for the locations of these wells.

While background groundwater quality at the Mill site had been established prior to commencement of operations and accepted by NRC, UDEQ has required, in Parts I.H.3 and I.H.4 of the GWDP, that DUSA re-evaluate established background for existing parameters in existing wells and establish background for new parameters in existing wells and for all parameters in new wells. Accordingly, on January 1, 2007, DUSA submitted to the Co-Executive Secretary of the Utah Water Quality Board (the Executive Secretary) the *Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah* (INTERA, 2007a), which evaluated all available historic groundwater monitoring data (both pre-operational and post commencement of operations at the Mill) for existing wells, as required under Part I.H.3 of the GWDP.

After review of the *Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah* (INTERA, 2007a), the Executive Secretary requested that certain revisions be made and a revised Background Report (INTERA, 2007d) was re-submitted to the Executive Secretary on October 29, 2007 (the "Background Report"). The revisions related primarily to the manner of evaluating the available data and the statistical methods that were employed in calculating Ground Water Compliance Limits (GWCLs). In addition, some missing historic data had been located, some additional quality assurance procedures performed, and three new quarters of data were added to the database. This resulted in changes to the database and to the resulting statistics and analyses. However, the conclusions in the Background Report did not change.

In order to supplement the Background Report, in April 2007, DUSA also submitted to the Executive Secretary the *Addendum: Evaluation of Available Pre-Operational and Regional Background Data* (INTERA, 2007b). This addendum to the background report focused on pre-operational and regional groundwater data in order to develop the best available set of background data for the site that could not conceivably have been influenced by Mill operations. A revised version of that Addendum, which incorporated the changes in the database reflected in the Background Report, (the April 2007 Addendum) was filed with the Executive Secretary on November 16, 2007 (INTERA, 2007e). While the conclusions in the revised version of the April 2007 Addendum had not changed, the updated database resulted in some changes to the figures and tables and related analyses.

The *Addendum: Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah* (INTERA, 2007c), the first version of this Report, was submitted to the Executive Secretary on May 31, 2007, as required by Part I.H.4 of the GWDP. The purpose of this Report is to analyze the data collected from the new monitoring wells, which were installed in 2005, to determine background concentrations for constituents listed in the GWDP for each well. The analysis of these wells also includes an investigation of whether these wells have been impacted by operations at the Mill. This Report should also be considered an addendum to the Background Report and incorporates by reference the provisions of the Background Report that apply to the site generally.

After review of the first version of this Report, the Executive Secretary requested that certain revisions be made to this Report in order to apply the same statistical methods used in the revised versions of the Background Report and the April 2007 Addendum and that this revised Report be re-submitted. The revisions relate primarily to the manner of evaluating the available data and the statistical methods to be employed in calculating GWCLs. In addition, three new quarters of data have been added to the database. This has resulted in changes to the database and to the resulting statistics and analysis. However, as was the case with the Background Report and the April 2007 Addendum, our conclusions have not changed.

The Background Report concluded that:

- There are a number of exceedances of the GWDP ground water quality standards (GWQSs) in upgradient and far downgradient wells at the site, which cannot be considered to have been impacted by Mill operations to date. Exceedances of GWQSs in monitoring wells nearer to the site itself are therefore consistent with natural background in the area. In situations where the constituent that exceeds the GWQS is not trending upward, the proper conclusion is that it is representative of natural background.

- There are numerous cases of both increasing and decreasing trends in constituents in upgradient, far downgradient, and Mill site wells, which provide evidence that there are natural forces, unrelated to mill operations, at work that are impacting groundwater quality across the entire site.

In almost all cases where there are increasing trends in constituents in wells at the site, there are increasing trends in those constituents in upgradient wells. Furthermore, and more importantly, in no case is there any evidence in the wells in question of increasing trends in chloride, which is considered the most mobile and best indicator of potential tailings cell leakage at the site. We consider the combination of these factors to be conclusive evidence that all increasing trends at the site are caused by natural forces and not by Mill activities.

As a result, we concluded in the Background Report that after extensive analysis of the data there have been no impacts to groundwater from Mill activities.

The analysis conducted in the April 2007 Addendum supported this conclusion. In the April 2007 Addendum, we concluded that:

- With few exceptions (uranium in MW-14, selenium in MW-15 and fluoride in upgradient MW-19), all of the current results for existing wells fall within the range of background results established in the background. However, while these three exceptions set new highs in concentrations for those constituents (one of them upgradient), they do fall within the range of variability established by background. In other words, given this natural variability across the site and region, with the addition of nine new wells to the other background wells and sources, it is not unexpected that three of the eight constituents in these nine wells would set new highest levels in the region.

- There are no wells that have unusually high levels of a combination of the indicator parameters. High levels of uranium are not associated with high levels of chloride,

> fluoride or sulfate (other than uranium and sulfate in far downgradient well MW-22). High levels of manganese or selenium are not associated with high levels of these indicator parameters (other than manganese and sulfate in far downgradient well MW-22 and manganese and chloride in far upgradient well #38). No wells have unusually high levels of several different parameters. The high concentrations of the various constituents are distributed in a manner across the site and region that does not show any particular pattern or indicate potential tailings cell leakage.

As a result, we concluded in the April 2007 Addendum that the analysis in that document confirms our conclusions in the Background Report that groundwater at the Mill site and in the region is highly variable naturally and has not been impacted by Mill operations. Varying concentrations of constituents at the site are consistent with natural background variations in the area. It is therefore not possible to conclude that higher concentrations of constituents downgradient of the Mill site necessarily imply contamination from site activities. As is evident from this analysis, higher concentrations of a number of constituents occur naturally far downgradient of the Mill site. See Section 8 of the Background Report for a discussion of factors that contribute to natural spatial variability of groundwater in the Burro Canyon Formation.

In this Report, we perform a quality assurance and data validation and statistical analysis of the available data for the new wells, as required by Part I.H.4 of the GWDP. This includes extreme analysis (see Box Plots in Appendix A), regression analysis (see Appendix B), probability analysis (see Appendix C), and tests for normality (see Histograms in Appendix D). These analyses were performed on the data for each parameter in each new well. To be consistent with the Background Report and the April 2007 Addendum, the statistical analysis and the determination of GWCLs for each parameter in each well followed the UDEQ-approved flow sheet (the "Flow Sheet") included as Figure 17 of this Report. A summary of the statistical analysis performed in accordance with the Flow Sheet, including a comparison of the proposed GWCLs for each parameter in each new well to the GWQS for that parameter, is presented in Table 10. We then compared the results of the analysis of the new well data to the results for the existing wells and regional background data discussed in the Background Report and in the April 2007 Addendum to determine whether or not there are any spatial patterns suggested by the monitoring results for the new wells, that would either confirm or bring into question our earlier conclusions in the Background Report and in the April 2007 Addendum.

A comparison of the current data for all wells (new wells and existing wells) to the regional background data is contained in Figures 3 to 16. The concentration plots display relative concentrations at each well or source by setting the area of the symbol (circle) in direct proportion to the magnitude of the concentration. In reviewing these figures, it should be kept in mind that clusters of plots at the downgradient edges of the tailings cells do not imply higher concentrations at those locations, but rather result from the fact that more wells have been placed at those locations. At those locations, the areas of the circles should be taken into consideration rather than the mere proximity of circles. These figures show the spatial distribution of the various constituents.

From a review of Appendices A, B, C, and D and Figures 3 through 16 the following conclusions can be made:

- All data from the new wells fall within the range of variability established by the Background Report and the April 2007 Addendum, with the exception of nitrate in MW-30 and MW-31, which we have concluded may be associated with the plume from the historic leach fields at the site that have given rise to the chloroform plume at the site (see Section 7.3.1 of the Background Report for a discussion of the chloroform investigation at the site).

- There are no wells that have a consistent spatial relationship between parameters and tailings impoundments.

As a result, we have concluded that the sampling results for the new wells confirm the high variability of all constituents across the site and region, which have been described in the previous reports. The groundwater at the Mill site and in the region is highly variable naturally and has not been impacted by Mill operations. Varying concentrations of constituents at the site are consistent with natural background variations in the area.

We confirm our conclusions in the Background Report that, because Mill activities have not impacted background groundwater quality, setting the GWCLs in accordance with the criteria set out in the Flow Sheet as reflected in Table 10 will be appropriate for each constituent, without further analysis, and subject to the general considerations discussed in Section 2.3 and 2.4.

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LIST OF ACRONYMS

µg/L	micrograms per liter
mg/L	milligrams per liter
DOE	United States Department of Energy
DUSA	Denison Mines (USA) Corp.
EPA	United States Environmental Protection Agency
Mill	White Mesa Uranium Mill
NRC	United States Nuclear Regulatory Commission
GWCL	Ground Water Compliance Limit (as stated in the GWDP)
GWDP, Permit	Ground Water Discharge Permit (State of Utah Division of Water Quality Department of Environmental Quality Utah Water Quality Board. Ground Water Discharge Permit No. UGW370004 Issued March 8, 2005)
GWQS	Ground Water Quality Standard (as stated in the GWDP)
MW	monitoring well
QA/QC	quality assurance/quality control
TDS	total dissolved solids
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality

1.0 INTRODUCTION

This Report on background groundwater quality for new wells at Denison Mines (USA) Corp.'s (DUSA's) White Mesa Uranium Mill (Mill) was prepared to meet the requirements stated in Part I.H.4 of the Mill's State of Utah Groundwater Discharge Permit (GWDP) No. UGW370004 issued on March 8, 2005. This document focuses on recently installed groundwater monitoring wells (MWs) MW-23, MW-24, MW-25, MW-27, MW-28, MW-29, MW-30, MW-31, and MW-3A (see Figure 1 for a map showing monitoring well locations) which have been monitored quarterly for groundwater quality since June 2005. For the remainder of this Report, these wells will be referred to as the "new wells."

The new wells were installed in the first quarter of 2005 as required by Part I.H.1 of the GWDP. This Report is the first analysis of the groundwater quality of those wells in accordance with the GWDP. This analysis of groundwater quality in the new wells will help to establish background concentrations for those wells and to determine if groundwater has been impacted by Mill operations.

On January 1, 2007, DUSA submitted to the Co-Executive director of the Utah Water Quality Board (the Executive Secretary) the *Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah* (INTERA, 2007a), which evaluated all available historic groundwater monitoring data (both pre-operational and post commencement of operations at the Mill) for the monitoring wells in existence at the site and incorporated into the monitoring program set out in the GWDP at the time of issuance of that permit as required under Part I.H.3 of the GWDP. Those monitoring wells are MW-1, MW-2, MW-3, MW-5, MW-11, MW-12, MW-14, MW-15, MW-17, MW-18, MW-19, MW-26 and MW-32 (referred to in this Report as the existing wells). In order to supplement the Background Report, in April 2007, DUSA also submitted to the Executive Secretary the *Addendum: Evaluation of Available Pre-Operational and Regional Background Data* (INTERA, 2007b), which focused on pre-operational and regional groundwater data in order to develop the best available set of background data for the site that could not conceivably have been influenced by Mill operations.

After review of the Background Report and the April 2007 Addendum, the Executive Secretary requested that certain revisions be made to those reports. The revisions related primarily to the manner of evaluating the available data and the statistical methods to be employed in calculating Ground Water Compliance Limits (GWCLs). This resulted in the development of a flow sheet (the "Flow Sheet") (see Figure 17) for the statistical analysis and the determination of the

GWCLs for each constituent in each well. The revised Background Report (the "Background Report") and revised April 2007 Addendum (the "April 2007 Addendum") were filed with the Executive Secretary in October 2007 and November 2007, respectively. While the changes in the statistical methods resulted in changes to the database and to the resulting statistics and analysis, our conclusions did not change.

The *Addendum: Background Groundwater Quality Report: New Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah* (INTERA, 2007c), the first version of this Report, was submitted to the Executive Secretary on June 1, 2007, as required by Part I.H.4 of the GWDP. The purpose of this Report is to analyze the data collected from the new wells, which were installed in 2005, to determine background concentrations for constituents listed in the GWDP for each well. The analysis of these wells also includes an investigation of whether these wells have been impacted by operations at the Mill. This Report should also be considered an addendum to the Background Report and incorporates by reference the provisions of the Background Report that apply to the site generally.

After review of the first version of this Report, the Executive Secretary requested that certain revisions be made to this Report in order to apply the same statistical methods used in the revised versions of the Background Report and the April 2007 Addendum, as reflected in the Flow Sheet, and that this revised Report be re-submitted. The revisions are incorporated into this document and relate primarily to the manner of evaluating the available data and the statistical methods to be employed in calculating GWCLs. In addition, three new quarters of data have been added to the database. This has resulted in changes to the database and to the resulting statistics and analysis. However, as was the case with the Background Report and the April 2007 Addendum, our conclusions have not changed.

2.0 APPROACH USED AND APPLICATION OF APPROACH TO THE DATA

2.1 Summary of Issues to be Addressed and Approach Used

The Mill is an existing facility that has been in operation since 1980 (see Section 2.0 of the Background Report for a discussion of the Mill, its historical operations, and environmental setting). The Background Report outlines steps to be taken in reviewing groundwater monitoring data to ensure that monitoring results to be used to determine background groundwater quality at the site have not been impacted by Mill activities. The Background Report identified parameters within the monitoring data set that may allow early identification of uranium milling-related groundwater impacts so that responsible and expeditious corrective actions can be undertaken.

It is well established that groundwater in the perched zone at the Mill site is highly variable and generally of poor quality. This is supported by the pre-operational and regional groundwater monitoring results analyzed in the April 2007 Addendum. As discussed in the April 2007 Addendum, an analysis of these background data indicate a high variability of all constituents across the site and the region. For some constituents (chloride) the highest observed values are upgradient of the site. For others (sulfate, total dissolved solids [TDS], selenium and manganese) the highest observed values are far downgradient of the Mill site, or in the case of fluoride, both at the site and far downgradient of the site. For still others (uranium and gross alpha) the highest concentrations are both upgradient and far downgradient of the site. It is therefore not possible to conclude that higher concentrations of constituents downgradient of the Mill site necessarily imply contamination from site activities. As is evident from this analysis, higher concentrations of a number of constituents occur naturally downgradient of the Mill site.

The analysis in the Background Report and the April 2007 Addendum confirms that it is necessary to observe the behavior over time of constituents in wells on an intra-well basis as is required under the GWDP and under previous United States Nuclear Regulatory Commission (NRC) monitoring. It is also noteworthy that the background results analyzed in the April 2007 Addendum would have resulted in 17 out-of-compliance situations and 9 exceedances of groundwater quality standards (GWQSs) under the current GWDP compliance limits, purely from natural background, thus giving further support for the need to set compliance limits on a well by well and constituent by constituent basis.

There are also natural forces that have resulted in upward and downward trends in a number of constituents in groundwater at the Mill site as well as upgradient and far downgradient of the Mill site itself. The existence of such trends both upgradient and far downgradient of the Mill site is evidence that such trends can result completely from natural causes. See Section 8.0 of the Background Report for a discussion of the natural influences that can be at play at the site.

Because water quality varies naturally from well to well and natural influences have caused increasing and decreasing trends at the site, it is not possible to conclude that an upward trend in a constituent necessarily represents an impact from milling activities. As with the Background Report, each upward trend in a parameter in a new well has been evaluated in this Report to determine whether it is caused by natural influences or by Mill activities.

Additional support for the conclusions that groundwater concentrations in the perched zone are naturally variable and that observed trends in concentrations of constituents are unrelated to uranium milling at the site comes from preliminary data collected during a University of Utah study that was sponsored by the Utah Department of Environmental Quality (UDEQ). Preliminary data collected by the University of Utah includes tritium data for samples of groundwater from a number of site monitor wells. These data are published at http://www.radiationcontrol.utah.gov/Uranium_Mills/IUC/uofu_gwifstudy/index.html. The fact that tritium was not detected in samples from most wells suggests that groundwater in these wells is older than atomic testing that began in 1952 (Solomon and Cook, 2000).

In evaluating the new well data, we have used the same approach that was used in the Background Report. If data for a constituent in a well do not demonstrate a statistically significant upward trend, then the proposed GWCL for that constituent is accepted as representative of background (regardless of whether or not the proposed GWCL exceeds the GWQS issued in the GWDP) for that constituent (see Table 1 for a listing of the GWQS for each groundwater monitoring constituent under the GWDP); and if data for a constituent in a monitoring well represents a statistically significant upward trend, then those data are further evaluated to determine whether the trend is the result of natural causes or Mill activities. If it is concluded that the trend results from natural causes, then the proposed GWCL for the constituent in the well, as calculated in accordance with the Flow Sheet and as set out in Table 10, is appropriate, but subject to the general considerations discussed in Sections 2.3 and 2.4.

In addition, after further evaluating any such parameters, we compared the groundwater monitoring results for the new wells to the results for the existing wells analyzed in the Background Report and to the pre-operational and regional results analyzed in the April 2007 Addendum. This is particularly important for the new wells because there is no historic data for those wells that goes back to commencement of Mill operations. A long-term trend in a constituent may not be evident from the available data for the new wells. By comparing the means for the constituents in the new wells to the results for the existing wells and regional background data, we are able to determine if the concentrations of any constituents in the new wells are consistent with background at the site.

As will be discussed in detail below, after applying the foregoing approach, we have concluded that there have been no impacts to groundwater in the new monitoring wells from Mill activities. The groundwater monitoring results for the new wells are consistent with the results for existing wells analyzed in the Background Report and for the pre-operational and regional wells, seeps, and springs analyzed in the April 2007 Addendum. There have been some detections at the Mill site of chloroform and related organic contamination and degradation products and nitrate and nitrite, which are the subject of a separate investigation, but that contamination is the result of pre-Mill activities (see Section 7.3 of the Background Report for a discussion of organics detected at the site).

2.2 Application of Approach to the Database

The database that was assembled from monitoring results of the new wells at the site is representative of over 4,000 data entries. After performing a quality assurance evaluation and data validation of the new data in accordance with the requirements of Part I.H.3 of the GWDP, a database consisting of groundwater monitoring data from the new wells was developed. See Section 5.0 for a discussion of the quality assurance and quality control issues that were addressed in assembling the database.

From that database, a proposed GWCL was calculated for each constituent in each well in accordance with the Flow Sheet (see Figure 17) and the discussion in Section 2.4. As required by the Flow Sheet, the manner of calculating a proposed GWCL varied depending on the data set for each constituent in each well. Part I.B of the GWDP contemplates that background groundwater quality will be determined on a well-by-well basis as defined by the mean plus two standard deviations concentration. However, as discussed in more detail in Sections 6.0 and 13.0 of the Background Report, calculating the GWCL as the mean plus two standard deviations is only appropriate for normally or log-normally distributed constituents, where the number of non-detects is 50 percent or less. Therefore, in accordance with EPA Guidance (1992), as set out on the Flow Sheet, the data set was divided into the following categories:

- Normally or log-normally distributed, with 0-15 percent non-detects. For those constituents, the arithmetic mean and standard deviation have been calculated and GWCL calculated as the mean plus two standard deviations.

- Normally or log-normally distributed, with greater than 15 but less than or equal to 50 percent non-detects. For those constituents, the mean and standard deviation have been estimated using Cohen's or Aitchison's method, and the GWCLs were calculated as the Cohen or Aitchison mean plus two Cohen or Aitchison standard deviations.

- All constituents having greater than 50 but less than or equal to 90 percent non-detects or that are non-parametrically distributed. In these cases, the GWCL has been calculated as the greater of: a) the highest historical value for the constituent (the non-parametric method suggested in those circumstances by EPA Guidance (1992), and b) the fractional approach under the Utah Administrative Code (UAC) R317-6-4.5(B)(2) or 4.6(B)(2) which is the basis for the existing GWCLs in the GWDP.

- All constituents having greater than 90 percent non-detects. For those constituents, the GWCL is calculated as the greater of: a) the Poisson limit (as suggested in EPA Guidance [1992]), and b) the fractional approach under UAC R317-6-4.5(B)(2) or 4.6(B)(2).

Constituents that were 100 percent non-detects for any well were assigned the original permit GWCL. Tests for normality were performed (See Section 5.2 of the Background Report) and the data was divided into the foregoing categories (see Section 6.1 of the Background Report). The results of this analysis and the proposed GWCLs for each constituent in each well are summarized in Table 10. Exploratory descriptive statistics on all available data from the new wells are presented in Tables 2a and 2b. The geometric mean and standard deviation for all normal or log-normally distributed data sets with less than 50 percent non-detects is in Table 4.

Linear regression and Mann-Kendall trend analyses were performed on each constituent in each well, as appropriate. For constituents that are normally or log-normally distributed with 15 percent or fewer non-detects, linear regression analysis alone was performed. For constituents that are normally or log-normally distributed with greater than 15 but less than or equal to 50 percent non-detects, Mann-Kendall analysis as well as linear regression were performed. For all other constituents, Mann-Kendall analysis was performed.

Data plots for all constituents are set out in Appendix B. Linear regression results for those constituents with at least eight valid data points are also set out on those data plots, even for those constituents where Mann-Kendall analysis alone is justified. In those cases, the linear regression analysis is provided as a visual aid in viewing the data and should be considered as "exploratory statistics" only. Rising trends identified by either linear regression (for normally or log-normally distributed constituents having 50 percent or fewer non-detects) or Mann-Kendall (for all non-parametric constituents and all constituents with greater than 15 percent non-detects) were flagged for further investigation. See Sections 4.0, 5.0, and 6.0 of the Background Report for a full discussion of the statistical approaches used in the Background Report and this Report.

2.3 Constituents with a Statistically-Significant Rising (Decreasing pH) Trends

For those constituents with a rising (decreasing pH) trend, the Flow Sheet indicates that a modified approach to determining the GWCLs should be considered in order to recognize the fact that GWCLs set at absolute values are subject to being violated as a result of such trends, solely due to natural background causes.

We have reviewed each of these data sets and have concluded that a reasonable approach would be to set the GWCL as the highest of: a) the Flow Sheet manner of calculating GWCLs for the various categories described in Section 13.1 of the Background Report for non-trending constituents; b) the highest historical value; and c) the fractional approach under R317-6-4-4.5(B)(2) or 4.6 (B)(2). In cases where the proposed GWCL (determined by the foregoing approach) is less than 20 percent above the mean, we have modified the GWCL to be the mean plus 20 percent of the mean. The rationale behind this modification is described in detail below in Section 2.4.

If natural influences continue to cause a rising trend (decreasing pH) in any constituents that lead to a violation of any of the proposed GWCLs, then the fact that they are subject to natural background influences should be taken into account in evaluating any out-of-compliance situations. Specifically, Part I-G.4 of the GWDP should be amended to contemplate an investigation as to whether or not an "out-of-compliance" situation has been caused by natural influences, and to provide that a remedial action would not necessarily be required under the GWDP. If it is not possible to make such an amendment to the GWDP, then further thought should be given to setting GWCLs for upward trending constituents.

In addition, the proposed GWCLs set out in Table 10 for trending constituents should be re-evaluated upon GWDP renewal to determine if they are still appropriate at the time of renewal.

2.4 Issues that Require Special Consideration

Issues became apparent during the compilation of this report that required a minor modification to the method of calculating the GWCL for a few constituents and locations. Changes were made for a few normally or lognormally distributed constituent data sets with low standard deviations and for pH data. The reasons for the modifications and the procedures implemented are described below.

The previously submitted documents have demonstrated that current concentrations of constituents in monitor wells at the site represent natural background conditions. This conclusion has gained additional support through a recent site specific study conducted by researchers at the University of Utah that suggests that groundwater in site monitor wells predates uranium milling at the site. Concentration trends in natural background that are not accounted for in the GWCL may cause unnecessary corrective actions to be taken and could limit the effectiveness of any action that might be employed. Another factor to consider is that, assuming a normal distribution, setting the GWCL at a value of two standard deviations above the mean, virtually guarantees that each well will be out of compliance in about two and a half percent of all concentration values measured in groundwater samples from that well. This factor is in addition to spatial and temporal changes known to be migrating onto the site with currently unknown implications (i.e., changes in groundwater levels that clearly originate off site).

During calculation of those GWCLs that were determined by adding two standard deviations to the mean of sample concentrations, a condition arose that did not occur during the same calculation for the existing wells. Because the data for new wells is limited to that collected over two to three years and because it was all analyzed by the same laboratory, the standard deviation was typically lower than similar values for the existing wells, in some cases resulting in a GWCL that is very close to the average value of the data set. For example, the average value for the chloride concentration in MW-30 is 124.89 mg/L with a standard deviation of 1.62, resulting in a calculated GWCL of 128 mg/L. There are a number of other similar circumstances where the difference between the average value and the Flow Sheet GWCL is very small.

DUSA believes that the use of the Flow Sheet GWCLs in these circumstances could result in an unwarranted out of compliance determination even if true concentrations do not change in the well. The U.S. Geological Survey has stated that under optimum conditions, the measured concentrations of major constituents may be within 2-10 percent of the true value and that constituents present in concentrations greater than 100 mg/L can generally be determined with an accuracy of +/- 5 percent (Hem, 1992). They note that for constituents present in concentrations of less than 1 mg/L, an accuracy of +/- 10 percent is considered good and as concentrations approach the detection limit of the method used and in *"all determinations of constituents that are near or below the micro-gram-per-liter level, both accuracy and precision are even more strongly affected by the experience and skill of the analyst."*

Thus, if a sample from MW-30, for example, is assigned to a different analyst at the contract lab for chloride analysis, his result could easily be outside of the 10 percent of the true value returned under optimum conditions. Assuming that the current average of 125 mg/L is the true concentration in the sample, and adding the 10 percent variation possible under optimum conditions, even an experienced analyst could potentially return a value of 137 mg/L and that result would exceed the GWCL by 9 mg/L.

The USEPA recognizes this problem and, in guidelines for inorganic data review, sets limits on the variability in duplicate analysis that is acceptable from their contract laboratories (USEPA, 2004). These limits are *"A control limit of 20% for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values" ≥ five times (5x) the Contract Required Quantitation Limit (CRQL)."* They go on to note that *"The above control limits are method requirements for duplicate samples, regardless of the sample matrix type. However, it should be* *noted that Laboratory variability arising from the sub-sampling of non-homogeneous soil samples is a common occurrence. Therefore, for technical review purposes only, Regional policy or project Data Quality Objectives (DQOs) may allow the use of less restrictive criteria (e.g., 35% RPD, 2x the CRQL) to be assessed against duplicate soil samples."*

Based on the above discussion, DUSA believes that a GWCL that is determined by adding two standard deviations to the mean of sample concentrations and results in a value that is less than 20 percent above the mean of the population should be revised to 20 percent above the mean. This has resulted in proposed GWCLs for some constituents that are different than what would otherwise be proposed under the Flow Sheet in 43 circumstances. These constituents are indicated in purple on Table 10.

In addition, as described in Section 2.5.6, there is a systematic decline in pH values in samples from all monitor wells at the site. This systematic decline is clearly unrelated to any potential tailings seepage or site activities and therefore should be considered to relate to natural background. Because samples from some wells have measured pH values that are below the 6.5 default standard and samples from other wells may fall below that value if current trends continue, the method for calculating the GWCL has been set to the mean minus 20 percent in a manner analogous to that described for other normal or lognormal data sets above. This has resulted in proposed GWCLs for pH that are different than what would otherwise be proposed under the Flow Sheet. These circumstances are indicated in purple on Table 10.

2.5 Conclusions

Table 3 sets out those constituents that have a proposed GWCL in excess of the GWQS and/or demonstrate a statistically-significant upward trend (decreasing in the case of pH), using either linear regression, where appropriate, or Mann-Kendall analysis (see Section 6.4 of the Background Report for a detailed discussion of the linear regression and Mann-Kendall methods of trend analysis) and, therefore, require further evaluation[1]. All other constituents have a proposed GWCL that is less than their respective GWQS and do not demonstrate increasing trends (decreasing in the case of pH). For those constituents, the proposed GWCLs set out in Table 10 should be considered to be appropriate, without further analysis, subject to the general considerations discussed in Sections 2.3 and 2.4.

Each of the constituents included in Table 3 is discussed in turn in the following sections.

2.5.1 Manganese

Table 3 indicates that the proposed GWCLs for manganese exceed the GWQS in groundwater samples from the following monitoring wells: MW-24; MW-25; MW-28; MW-29; and MW-3A. The proposed GWCLs that exceed the GWQS are lower than the highest observed values in the region in far downgradient well MW-22 (34,550 µg/L) and in far upgradient Well #38 (7,450 µg/L). The proposed GWCLs for other new wells (MW-30 and MW-31) are comparable to or lower than other wells at the site. Additionally, the new well with the highest mean concentration of manganese, MW-29 (5,028 µg/L), was age dated by the University of Utah using a tritium isotopic method and preliminary results indicate that the water in MW-29 predates any milling activities at the site. There are no statistically significant rising trends in Manganese in any of the new wells. Manganese concentrations measured in new wells are therefore consistent with background variability at the site.

Manganese concentrations that exceed the GWQS of 800 µg/L are prevalent throughout the site and region (see the discussion in Section 6.2.5 below). Manganese concentrations in groundwater samples from the new wells are consistent with natural variability in background. The new wells with the highest concentrations of manganese, MW-29 and MW-24, with concentrations of 5,028 and 3,535 µg/L, respectively, are not associated with high concentrations of chloride or uranium and are associated with only moderate concentrations of fluoride and sulfate, which are the best indicator parameters for potential tailings cell leakage. Accordingly,

[1] It should be noted that Table 3 in this revised Report contains a number of constituents not included in Table 3 of the first version of this Report. In most cases, i.e., uranium in MW-23, MW-24 and 3A, cadmium in MW-28 and MW-3A and nickel in MW-3A, the constituents appear in Table 3 of this Report because that table now compares the proposed GWCLs to the GWQS, whereas Table 3 in the first version of this Report compared the mean concentration of the constituents to the GWQS. As the proposed GWCL is in most cases the mean plus second standard deviation or the equivalent, the proposed GWCL in each case exceeds the mean concentration and is therefore more likely to exceed the GWQS. In fact for each of the constituents listed above in this note, the mean concentration does not exceed the GWQS. For the other constituents now on Table 3, but not on the first version of Table 3, i.e., sulfate in MW-23, Iron in MW-30 and pH in MW-25, MW-27 and MW-28, the added data from three additional quarters of monitoring have resulted in statistically significant trends.

we do not consider the manganese at the site to have originated from potential tailings cell leakage.

2.5.2 Cadmium

Proposed GWCLs for cadmium exceed the GWQS in MW-28 and far-downgradient MW-3A. Cadmium is typically relatively insoluble in water except at low pH (Rai and Zachara, 1984); further, it is present in a relatively low average concentration of 3,400 µg/L in tailings solutions (Utah Division of Radiation Control Statement of Basis, 2004). These observations argue against a potential tailings seepage source for cadmium concentrations in MW-28 and MW-3A without accompanying low pH and high chloride and sulfate that are known to be present in tailings solutions. As will be described below, these conditions and concentrations are not present in MW-28 or MW-3A. Also, and more importantly, MW-3A is far-downgradient of the Mill's tailings cells and is extremely unlikely to have been impacted by tailings solutions. High concentrations of indicator parameters, such as chloride, would be expected to be observed at such a distant well before cadmium in the event of a potential tailings cell leak.

Further, the mean cadmium concentration in samples from MW-28 and MW-3A is 3.3 and 2.2 µg/L, respectively. These values compare with mean concentrations from nearby monitor wells MW-2 (2.9 µg/L) and MW-5 (3.2 µg/L) which have University of Utah tritium isotopic age dates indicating that the water in these wells predates any milling activities at the site. Cadmium concentrations measured in new wells are therefore consistent with background variability at the site. As a result, we have concluded that potential tailings seepage has not impacted cadmium concentrations in samples from MW-28 or MW-3A.

2.5.3 Uranium

The calculated uranium GWCLs in monitor wells MW-23 (32 µg/L), MW-24 (36 µg/L), MW-27 (34 µg/L), and MW-3A (35 µg/L) are slightly elevated above the GWQS of 30 µg/L. However, while the mean uranium concentration of MW-27 (31.40 µg/L) is slightly elevated above the GWQS, the mean concentrations in the other wells are all lower than the GWQS (23.2 µg/L, 9.0 µg/L, and 24.7 µg/L for MW-23, MW-24, and MW-3A, respectively). These values are all within the range of regional background values for uranium (for example, 48.5 µg/L and 42.8 µg/L in upgradient Well #39 and MW-18, respectively and 41.7 µg/L and 31.4 µg/L for far downgradient MW-22 and MW-3, respectively (see Figure 6). None of these wells exhibits a statistically significant increasing trend in uranium concentration over time. Furthermore, MW-18 and MW-3 are among those wells that have University of Utah tritium isotopic age dates indicating that the water in them predates any milling activities at the site. For these reasons, the uranium concentrations in MW-23, MW-24, MW-27, and MW-3A are not consistent with potential tailings seepage impacts and are consistent with regional background values.

2.5.4 Nitrogen, Nitrate + Nitrite as N

The concentrations of nitrate in monitoring wells MW-30 and MW-31 are similar to those observed in monitoring wells associated with the chloroform plume. The source of these constituents is believed to be discharge of laboratory chemicals and sewage to historic leach fields that pre-date Mill operations. The average concentrations of nitrate in MW-30 and MW-31 of 14 mg/L and 23.90 mg/L, respectively are consistent with concentrations associated with those leach fields. For example, average nitrate concentrations in chloroform investigation well TW4-19 which is located close to the leach field that is nearest to those wells averaged approximately 50 mg/L in 2002 and 2003 (see Appendix K of the Mill's Chloroform Monitoring Report for the 4th quarter of 2006). We conclude that nitrate concentrations in MW-30 and MW-31 are either associated with the chloroform contamination, which is currently subject to remediation, and will not be considered further in this report.

It should be noted that chloride concentrations in MW-30 and MW-31 of 125 mg/L and 133 mg/L, respectively, while not the highest in the region (Well #38 has been measured at 212.5 mg/L), they are relatively high compared to most other monitoring wells. These relatively high concentrations of chloride in MW-30 and MW-31 are within the range of variability of background in the region and are therefore consistent with background. However, these chloride concentrations may also have been influenced by the leach fields that have given rise to the chloroform plume and the relatively high nitrate and nitrite concentrations associated with the chloroform monitoring wells. The fact that MW-30 and MW-31 have relatively low concentrations of sulfate and uranium and low to moderate concentrations of fluoride suggest that the high chloride and nitrate and nitrite concentrations in those wells are not the result of potential tailings seepage.

2.5.5 Selenium

The highest observed average value of selenium concentration in MW-3A is 71.8 µg/L. MW-3A is located far down gradient and, based on calculated travel times (see Appendix B of the April 2007 Addendum), is extremely unlikely to have been impacted by potential tailings cell seepage. The observed average selenium concentration in MW-31 (62.6 µg/L) is within the range of selenium concentrations in existing wells and regional background wells and is not related to potential tailings cell seepage. As mentioned in Section 2.5.4 above, MW-31 is associated with low concentrations of sulfate, uranium, and moderately low concentrations of fluoride, which suggests that selenium concentrations in that well are not associated with potential tailings cell seepage.

2.5.6 pH

There are statistically significant decreasing trends in pH in MW-25, MW-27, MW-28, and MW-3A with the most significant of these being in MW-3A. However, in all cases, the pH levels typically fall within the GWQS range of 6.5-8.5. It is extremely unlikely that low pH tailings solutions could travel to the perched aquifer without being neutralized by the calcareous soils underlying the cells. If that were possible, we would expect to see rising trends in chloride, sulfate, fluoride, uranium, and other metals that are mobile in low pH solutions. However, we do not see any such trends.

It is also noteworthy that the most pronounced decreasing trend is in MW-3A which is far downgradient of the Mill's tailings cells. It would be extremely unlikely for low pH solutions originating in the tailings cell to maintain their low pH characteristics over a distance of approximately 3,000 feet to MW-3A in a carbonate-rich geologic setting especially without a much more dramatic decrease in pH being observed at any of the monitoring wells on the downgradient edge of the tailings cells.

Furthermore, on a review of the pH time plots in all existing wells (see Appendix D of the Background Report), there appears to be a general decreasing trend in pH in all wells. Figure 18 show results of linear regression analyses for all site monitoring wells over the same time period used for new wells. Regression lines trend downward in all site monitoring wells and among the existing wells the trends are statistically significant in MW-3, MW-12, MW-14 and MW-17. The fact that pH is trending downward in all site monitoring wells indicates that statistically significant decreasing trends in pH in MW-25, MW-27, MW-28, and MW-3A are not related to any potential tailings seepage impacts. Instead there is a systematic process occurring that affects the site as a whole. This process may be a natural phenomenon related to regional changes or it could be some systematic change in the way that samples are collected or analyzed. Since 2004 DUSA has been improving its sampling and analysis protocols at the request of the UDEQ. The pH measurements recorded during this period were all laboratory measurements. This period also coincides with the observed decreases in pH suggesting a potential connection with some laboratory process.

2.5.7 Nickel

The proposed GWCL for nickel in MW-3A of 105 mg/L exceeds the GWQS of 100 mg/L, although the mean concentration of nickel in that well of 33.78 mg/L is well below the GWQS.

There are no statistically significant rising trends in any constituents in MW-3A, which is also far downgradient of the Mill's tailings cells and has a University of Utah tritium isotopic age date indicating that the water in this well predates any milling activities at the site. It is therefore unlikely that any potential tailings cell seepage could have migrated to MW-3A and carried with it elevated concentrations of nickel in the absence of elevated concentrations of nickel in any monitoring wells immediately downgradient of the tailings cells or in the absence of an increasing trend or high concentrations of chloride in that well. We have therefore concluded that the concentration of nickel in MW-3A is the result of natural influences.

2.5.8 Sulfate

There is a statistically significant rising trend in sulfate in MW-23 although the mean concentration for sulfate in MW-23 of 2,224 mg/L is moderate for the site. However, there are no statistically significant rising trends in chloride, fluoride, or uranium in MW-23. In fact, the average concentration of chloride of 6 mg/L is the lowest at the site and the average concentration of fluoride of 0.3 mg/L is among the lowest at the site. The average concentration for uranium of 23.2 µg/L is moderate for the site. These facts, combined with the fact that there are significantly significant increasing trends in sulfate in upgradient MW-1 and MW-18 and other wells at the site (see Appendix D of the Background Report), leads us to the conclusion that the increasing trend in sulfate in MW-23 is the result of natural influences.

2.5.9 Iron

There is a statistically significant rising trend in iron in MW-30; however, the concentrations of iron in that well are very low with a mean of 75.6 µg/L compared to a GWQS of 11,000 µg/L. Samples of oxidized water with pH values between 6.5 and 8.5 that contain iron in concentrations above a few micrograms per liter are rare, and higher concentrations sometimes reported in such waters are generally particulates small enough to pass through a 0.45 micron filter (Hem, 1992). This is a common sampling problem in wells that produce little water or in wells with iron casings. While small variations in Eh and pH can cause variations in iron concentration in groundwater on the order of magnitude observed in MW-30 (Hem, 1992), iron is relatively insoluble except at very low pH, severely limiting the concentration of iron that can travel in groundwater in the carbonate rich geologic environment beneath the tailings impoundments. Therefore, it is unlikely that a potential tailings cell leak would manifest itself in an increasing trend in iron in the absence of increasing trends in chloride, sulfate, fluoride, and uranium. Furthermore, there are statistically significant rising trends in iron elsewhere at the site (in upgradient MW-1 and in MW-5) that we have concluded are not the result of Mill activities (see Section 11 of the Background Report). For these reasons, we have concluded that the rising trend in iron is due to natural influences and not potential tailings cell seepage.

2.5.10 Tetrahydrofuran

In addition to the constituents listed on Table 3, there were statistically significant trends in tetrahydrofuran in all new wells. However, these trends are due solely to a change in minimum detection levels and are not influenced by Mill activities.

The constituents listed in Table 3 all fall within the range of variability of pre-operational and regional background data as established by the April 2007 Addendum. Relatively high nitrate and nitrite concentrations in MW-30 and MW-31, along with the rising trend in nitrate and nitrite in MW-30, are consistent with and likely attributed to contamination originating from the leach fields that have given rise to the chloroform plume at the site. The relatively high concentrations of chloride in MW-30 and MW-31 may also have been influenced by those leach fields. Further discussion of these constituents is presented in Section 6.0.

3.0 SUMMARY OF HISTORICAL OPERATIONS AND ENVIRONMENTAL SETTING

The Mill is a permitted uranium mill with a vanadium co-product recovery circuit located within the Colorado Plateau physiographic province approximately 6 miles south of the city of Blanding, Utah. Mill construction began in 1979 and conventionally mined uranium ore was first processed in May 1980. Over its 25-year operating history the Mill has processed over 4 million tons of conventionally mined and alternate feed uranium ores for the recovery of 25 million pounds of U_3O_8 and 34 million pounds of vanadium to date. A detailed description of the uranium/vanadium processing method and Tailings Cell design and construction is described in Section 2.0 of the Background Report and Section 3.1 of the April 2007 Addendum.

4.0 GEOLOGY AND HYDROLOGY OF THE SITE

4.1 General

As described in Section 2.3 of the Background Report, the lower Cretaceous Burro Canyon Formation is directly overlain by Quaternary deposits at the Mill site. The Quaternary colluvial/alluvial sediments are typically coarse-grained deposits that contain little water. The Burro Canyon Formation is described as interbedded conglomerate and grayish-green shale with light-brown sandstone lenses deposited in a fluvial environment (Aubrey, 1989). The average thickness of the unit is approximately 75 feet (U.S. Department of Energy [DOE], 2004).

The Burro Canyon Formation hosts the uppermost occurrence of groundwater at the site and all compliance monitoring wells are screened in this unit. Groundwater in this unit is perched and is supported by the relatively impermeable, underlying, fine-grained Brushy Basin Member of the Morrison Formation. The permeability of the Burro Canyon Formation is generally low (Titan, 1994). Some conglomeratic zones may exist east to northeast of the tailings cells potentially explaining a relatively continuous zone of higher permeability in these areas. The saturated thickness of the perched groundwater zone ranges from approximately 82 feet in the northeast portion of the site to less than 5 feet in the southwest portion of the site (DOE, 2004).

Groundwater in the perched aquifer generally flows northeast to southwest in the area of the Mill's tailings cells. Figure 2 shows the 2007 groundwater elevations presented in the perched zone. Groundwater in the regional Entrada/Navajo aquifer, isolated from the perched zone by over 1,000 feet of Morrison Formation, is under artesian pressure (upward flow gradient). This hydrologic barrier isolates deeper groundwater from any potential seepage from overlying geologic units.

4.2 Permeability and Travel Times

The permeability of the Burrow Canyon Formation is discussed in detail in the April 2007 Addendum. Appendix B of the April 2007 Addendum includes travel time and permeability calculations.

5.0 QUALITY ASSURANCE EVALUATION AND DATA VALIDATION

Information on recent sampling protocols and practices is described in Section 2.6 of the facility Groundwater and Discharge Minimization Technology Performance Standard Monitoring Report (DUSA, 2008) submitted to UDEQ on March 27, 2008. Documentation of recent protocols and practices indicates a strong commitment to improved sampling and analysis techniques on the part of DUSA and its field personnel.

5.1 Preparation of the Data Set for Statistical Analysis

In order to perform meaningful statistical analysis, various data quality issues, some of which are listed in Part I.H.3 of the GWDP, had to be addressed. With the intent of providing a traceable analysis methodology, an untouched version of the complete data set was maintained for reference while separate worksheets for statistical analysis were prepared using the steps described in the Background Report for existing wells, including:

- Screen for Negative Values

- Screen for Zero Values
- Screen for Truncated Values
- Screen for Inconsistent Units
- Checks for Internal Consistency of the Data
- Screen for Duplicate Records
- Comparison of the Reporting Limits to Groundwater Quality Standards
- Screen for Insensitive Detection Limits as Defined in the URS Memo Dated Aug. 9, 2007
- Need for at least Eight Data Points

The first version of this Report was submitted to the Executive Secretary on June 1, 2007. After review of that version of the Report, the Executive Secretary requested that certain revisions be made and that this revised report be re-submitted to the Executive Secretary.

The revisions included changes to the manner of evaluating the available data and the statistical methods to be employed. The Executive Secretary and DUSA agreed on the manner in which the data would be evaluated, characterized, and interpreted and the manner in which GWCLs would be calculated from the data. The agreed approach is consistent with EPA Guidance (1989, 1992) and is reflected in the Flow Sheet entitled *Groundwater Data Preparation and Statistical Process Flow for Calculating Groundwater Protection Standards, White Mesa Mill Site, San Juan County, Utah*, a copy of which is included as Figure 17. The relevant statistics and other information necessary to implement the Flow Sheet and develop GWCLs for the site, on a well-by-well basis, are set out in Table 10.

This revised Report reflects the approach to data evaluation set out in the UDEQ approved Flow Sheet and also incorporates other requests for revision by the Executive Secretary. Also, we have added three quarters of new data that have become available since the date of the first version of this report (the second, third, and fourth quarters of 2007). As a result, the database has changed somewhat in this version of the Report compared to the first version of the Report, and a number of figures and tables in this Report and some of the resulting analyses have been updated and changed accordingly.

5.2 Comparison of Reporting Limits to Groundwater Quality Standards

Available data on reporting limits from DUSA reports (DUSA, 2005 to 2007) were compared with GWQSs to evaluate whether reporting limits were adequate to ensure compliance with standards. All reporting limits were less than the GWQSs.

5.3 Analytical Methods

Table 6 summarizes the current analytical methods used by Energy Laboratories for the various analytical constituent groups. Methods listed in Table 6 are considered appropriate for the groundwater analytes from the Mill based on wide consensus among regulatory agencies. EPA, American Society for Testing and Materials, the NRC, and most states recommend methodologies similar to those listed in Table 6.

5.4 Checks for Internal Consistency of the Data

The GWDP specified an evaluation of the internal consistency of the data. The following comparisons provide quantifiable methods for evaluating internal consistency:

- TDS calculated from total constituent mass versus measured TDS. Samples that had results for calcium, chloride, magnesium, potassium, sodium, sulfate, total alkalinity, and measured TDS were evaluated for comparability. In cases where alkalinity was not measured in a given data set, carbonate (CO_3) and bicarbonate (HCO_{3-}) were used to calculate alkalinity. Table 7 shows the data used to make the comparisons, which had an average ratio of 1.013 (101.3 percent) and a standard deviation of 0.084 (8.4 percent). If perfect, the ratio would be 1.0, so a ratio of 1.013 reflects good internal consistency. The ratios ranged from 0.842 to 1.298 (84.2 percent to 129.8 percent).

- Charge balance of major cations (Ca, Mg, K, Na) and anions (HCO_{3-}, Cl, SO_4). This can be done only for samples in which the major cations (calcium, magnesium, potassium, and sodium) and anions (bicarbonate or total alkalinity, chloride, and sulfate) have been analyzed. In this regard, the older data for the existing wells are incomplete for some of the major ions. The goal for dilute waters ranges from -5.0 to +5.0 percent. Data from the new wells showed charge balances (as a percentage, where 0 percent is perfect balance) ranging from -41.7 to +20.2 percent, with 63 percent of the values falling within the -5.0 to +5.0 percent range, and 94 percent of the values falling within the -10.0 to +10.0 percent, indicating fair internal consistency in the analysis (Table 8).

- When available, the relative percent difference between field duplicates was calculated to provide an estimate of sampling and analytical precision. Results, summarized in Table 9, indicate that most analyses are within acceptable limits and that the data set is usable for determining background groundwater quality.

6.0 DISCUSSION OF RESULTS AND COMPARISON TO EXISTING WELLS AND BACKGROUND

Pre-operational and regional background data have been analyzed and interpreted in the April 2007 Addendum. Please refer to the April 2007 Addendum for a discussion of pre-operational wells (MW-1, MW-2, MW-3, MW-4, and MW-5), regional wells (MW-20, MW-22, Well #37, Well #38, and Well #39), and seeps and springs (Cottonwood Seep and Ruin Spring).

A number of constituents were identified in the Background Report that required special analysis because they either exceeded GWQSs and/or exhibited increasing concentrations with time in site monitoring wells (Table 7.1-1 of the Background Report). Other constituents received special analysis due to their potential for providing an early warning of any possible tailings seepage impact to groundwater. Those previous analyses determined that there was no evidence of potential tailings seepage impact to groundwater in the extensive amount of data collected from existing site monitoring wells over more than 25 years of record. As described below, this Report updates the analysis from previous reports with data from new site monitoring wells. Results indicate no changes from the previously described site conceptual model and no change from the previous conclusion that there is no evidence of any potential tailings seepage impact to groundwater.

6.1 New Well Sampling Results

Because there was insufficient data from new wells to perform statistical analysis when the Background Report was being written, this Report provides a similar analysis for the new wells as was performed for the existing wells in the Background Report. Table 3 of this Report presents constituents and monitoring wells where proposed GWCLs exceed GWQSs and/or exhibit increasing concentrations (or decreasing pH) with time. Of these constituents, only cadmium, nickel and nitrate and nitrite as nitrogen (nitrate) were not addressed in the Background Report. Table 3 and these constituents are discussed in Section 2.5 above. Table 5 presents the results for all detected organics in new wells.

6.1.1 Chloroform

Chloroform was detected in well MW-3A during the second and third quarter sampling of 2005. However, it is unlikely that these two detections represent actual chloroform contamination in this well for two reasons: First, well MW-3A is far down gradient of all other wells with known chloroform contamination. Second, chloroform was never detected in well MW-3, which is directly adjacent to well MW-3A. For these two sampling periods chloroform was detected in deionized water blanks; therefore, it is more likely that these two chloroform detections in well MW-3A represent cross contamination during sampling.

Chloroform was also detected once in the second quarter of 2006 in MW-27 and once in the third quarter of 2005 in MW-28 but has not been subsequently detected in either one of these wells. These isolated detections are also likely the result of cross contamination during sampling, but given the relative proximity of MW-27 and MW-28 to the chloroform plume at the site, attention should be paid to any future chloroform detections in those wells.

6.1.2 Chloromethane

Chloromethane was detected in all nine new wells during the eight-quarter sampling period. However, chloromethane was also consistently detected in both deionized water blanks and in equipment rinsate samples. Therefore, detections of chloromethane are attributed to cross contamination during sampling and are not the result of chloromethane contamination in the wells. It is noteworthy that chloromethane concentrations have decreased dramatically over the two most recent quarters, suggesting improvement in QA/QC and sampling protocol.

6.1.3 Tetrahydrofuran

Regression plots for tetrahydrofuran show a statistically increasing trend in all wells except for MW-23 and MW-24. However, this trend is merely the result of a change in the reporting limit for tetrahydrofuran. The reporting limit for tetrahydrofuran during the first five quarters of sampling was 1.0 μg/L. For the last three quarters the reporting limit was changed to 10 μg/L. When a value was reported as not detected, half of the reporting limit was used for statistical analysis. Therefore, half of the non-detect values for tetrahydrofuran changed from 0.5 to 5 μg/L, causing the appearance of an increasing trend.

There are, however, a few instances where tetrahydrofuran was detected. It was detected in MW-23, MW-24, and MW-3A during the fourth quarter of 2005 and in MW-3A during the second quarter of 2006. The detections reported during fourth quarter sampling in 2005 are attributed to cross contamination in the report prepared by DUSA detailing fourth quarter sampling (DUSA, 2006). During this sampling period, tetrahydrofuran was detected in the field blank and in rinsate samples. The order in which the wells were or purged during that period was MW-25, MW-28, MW-27, MW-31, MW-30, MW-29, MW-3A, MW-23, and MW-24. Therefore, given this sampling order and given the fact that tetrahydrofuran was found in the field blank and rinsate samples, DUSA determined that it is unlikely detection of tetrahydrofuran in these wells represented tetrahydrofuran contamination in these wells, but rather represented cross contamination during sampling.

In the report detailing fourth quarter sampling in 2005, DUSA stated that it would change the order in which wells were sampled for the first quarter of 2006 to determine if tetrahydrofuran detection was indeed the result of cross contamination. Given that no detections for tetrahydrofuran occurred in the first quarter of 2006 and subsequent quarters, it is likely that detection of tetrahydrofuran during the fourth quarter of 2005 did in fact represent cross contamination.

The only other detection of tetrahydrofuran occurred in well MW-3A during the second quarter of 2006. No explanation is given for this detection in the report detailing this sampling period. However, given that tetrahydrofuran was reported as not detected during both the first quarter and third quarter of 2006, it is likely that this value also represents cross contamination during sampling and does not actually represent tetrahydrofuran contamination in well MW-3A.

6.1.4 Other Organics

Toluene was detected once in MW-24 and once in MW-3A. These concentrations are likely false positives due to field or lab error or cross contamination and are worthy of continued attention. Acetone and 2-Butanone were detected in early samples of MW-24 but have not been detected since the third quarter of 2005, suggesting a field or lab contamination issue, but are also worthy of continued attention.

6.2 Comparison of New Wells to Existing Wells and Background

The April 2007 Addendum examined available data that could not have been impacted by potential tailings seepage either because they were collected prior to any possible impact or because the monitoring wells are located too far upgradient, side gradient, or downgradient of the tailings impoundments to have been impacted. The primary conclusion of the April 2007 Addendum was that the range of data from the existing wells was encompassed by the range of pre-operational and regional background data indicating that there have been no impacts to groundwater from potential tailings seepage.

Chloride, fluoride, sulfate, uranium, manganese, selenium, cadmium, nickel, TDS, pH, iron, and gross alpha data from regional background wells, seeps and springs, and current data from new and existing on-site monitoring wells have been plotted on Figure 3 to compare concentrations of constituents in samples of groundwater from new wells to those in samples of groundwater from existing wells. Regional background well data is plotted to provide context for discussion. In

Figures 3 through 16, we have added the average of the twelve quarters of data for the new wells to the data used for the Figures in the April 2007 Addendum (i.e., the average of the 2006/2007 data, that were available at the time of the report, for all existing wells other than for the regional wells, seeps and springs, for which we plotted historical data). Figures 4 through 15 are plots of the same data by individual constituents, allowing for a more direct comparison of the concentration of each constituent at each well. The concentration plots display relative concentrations at each well or source by setting the area of the symbol (circle) in direct proportion to the magnitude of the concentration. In reviewing these Figures, it should be kept in mind that clusters of plots at the downgradient edges of the tailings cells do not imply higher concentrations at those locations, but rather result from the fact that more wells have been placed at those locations. At those locations, the areas of the circles should be taken into consideration rather than the mere proximity of circles. These figures show the spatial distribution of the various constituents.

Given the natural variability across the site and region, with the addition of seven new wells, it would not be unexpected that some of the constituents in those wells would set the new highest levels in the area surrounding the tailings impoundments. However, with few exceptions, all of the current results from the new wells fall within the range of previous results, and in the few cases where current data sets new highs, the new highs in concentrations fall within the range of variability established by pre-operational and regional background data (compare Figure 3 to Figure 18 of the April 2007 Addendum).

6.2.1 Chloride

Average chloride concentrations in groundwater samples from new monitoring wells MW-30 and MW-31 (125 and 133 mg/L, respectively) are higher than the average concentrations that have been previously observed in site monitoring wells (Figure 4). However, these values are within the 213 mg/L upper range of regional background values (upgradient background Well #38 is currently the location of highest observed values). Interestingly, even though MW-30 and MW-31 are the locus of the highest chloride concentrations among tailings monitoring wells, sulfate and uranium concentrations in samples of groundwater from these wells are among the lowest observed in site monitoring wells. Fluoride concentrations are low to moderate. Given that sulfate, uranium, and fluoride, along with chloride are, for a variety of reasons explained in Section 9.0 of the Background Report, primary indicators of potential tailings seepage, if the relatively high chloride concentrations were the result of potential tailings impacts, high, or at least proportional, concentrations of the former three constituents would be expected in MW-30 and MW-31. Therefore, we conclude that chloride concentrations in these wells are not the result of potential tailings seepage and are consistent with the natural variability within the Burro Canyon Formation groundwater. As mentioned in Section 2.5.4, it is also possible that the relatively high chloride concentrations in those wells could have been impacted by the leach fields that are the subject of the chloroform investigation.

6.2.2 Fluoride

The highest observed average concentration of fluoride is now in far downgradient new monitoring well MW-3A followed by upgradient background well MW-19 (Figure 5). As discussed in the April 2007 Addendum using highly conservative assumptions, a minimum travel time to far downgradient well MW-3 (located 3 feet from MW-3A) would be 678 years and a more realistic travel time would be in the range of 2,394 to 1,158 years rendering impact in 2007 from any potential tailings seepage unlikely. Further, any potential plume from the tailings impoundments would be expected to exhibit highest concentrations near the source and diminishing concentrations downgradient. Therefore, we conclude that the fluoride concentration in MW-3A results from natural variability within the Burro Canyon Formation groundwater.

6.2.3 Uranium

Average uranium concentrations in MW-27, upgradient of the tailings cells, are above the GWQS; however, the concentration of uranium in samples of groundwater from all new monitoring wells falls within the range of values from previously-existing site monitoring wells and regional background values. The highest observed average concentrations continue to be in samples of groundwater from MW-14 (59.8 µg/L) and MW-15 (49.3 µg/L) followed closely by regional background Well #39 (48.5 µg/L), upgradient monitoring well MW-18 (42.8 µg/L), and far downgradient monitoring well MW-22 (41.7 µg/L) (Figure 6). Note that samples of groundwater from MW-14 and MW-15 contain low concentrations of chloride and fluoride and moderate concentrations of sulfate, allowing the conclusion that uranium concentrations do not result from potential tailings seepage impacts.

6.2.4 Sulfate (and TDS)

Because sulfate is a large ion and is the dominant major anion in Burro Canyon Formation groundwater, it is a primary contributor to the measured TDS in site groundwater. Therefore, high sulfate groundwater from the site will also contain high TDS and, in general, low sulfate groundwater will also have low TDS. For purposes of this Report, we will discuss these two constituents together and assume that statements about sulfate also apply to TDS. The highest concentrations of both sulfate and TDS occur in samples of groundwater from far downgradient monitoring wells MW-22, MW-3A, and MW-3 (Figures 7 and 8). As discussed in the April 2007

Addendum and in the section on fluoride above, we conclude that the distance to these wells and the lack of characteristic plume behavior precludes a potential tailings source for the concentrations of sulfate and TDS observed in these wells and attribute these highest site levels to natural variability within the Burro Canyon Formation groundwater.

6.2.5 Manganese

The highest observed average concentration of manganese in site monitoring wells is now in new monitoring well MW-29 (5,028 µg/L) followed by existing monitoring well MW-32 (4,922 µg/L) (Figure 9). However, concentrations in samples of groundwater from both wells are within the regional background highs of 34,550 µg/L in far downgradient well MW-22 and 7,450 µg/L in regional background Well #38. Manganese values should be interpreted with caution because high values often result from colloidal particles that are entrained in groundwater samples during disturbances in well sediment caused by pumping. This effect is particularly common in wells that do not yield much water such as those on the west side of the tailings impoundments.

In no case does there appear to be a systematic spatial relationship between manganese concentrations and the location of the tailings impoundments.

6.2.6 Selenium

The concentration of selenium in samples of groundwater from all new monitoring wells fall within the range of values from previously existing site monitoring wells and regional background values. While the average concentration of 62.6 µg/L selenium in samples of groundwater from MW-31 exceeds the 50 µg/L GWQS for selenium, the average concentration of 106.5 µg/L occurring in samples of groundwater from existing well MW-15 is currently the highest observed at the site followed by 71.8 µg/L in far downgradient MW-3A (Figure 10). Samples of groundwater from MW-31 also contain relatively high concentrations of chloride but samples of groundwater from MW-15 do not. Samples of groundwater from MW-15 contain moderate concentrations of sulfate but samples of groundwater from MW-31 have sulfate concentrations that are among the lowest at the site.

Like many other constituents in site groundwater, selenium is retarded relative to chloride in groundwater transport processes and is present in tailings solutions at much lower concentrations than chloride or sulfate and it is unlikely that potential tailings seepage impacts would be first manifested only by selenium. Consequently, selenium concentrations in samples of groundwater at the site are judged to be unrelated to potential tailings seepage.

6.2.7 Gross Alpha

A discussion of gross alpha is included here to provide consistency with the Background Report. The concentration of gross alpha in each new well falls well within the range established for the site and are displayed on Figure 11. There are no high concentrations or rising trends in gross alpha in any of the new wells.

6.2.8 Cadmium

There are relatively high concentrations of cadmium in new wells MW-3A (2.23 mg/L) and MW-28 (3.29 mg/L). However, these concentrations are well within the range established for the site. For example, far downgradient well MW-3 and site well MW-5 have concentrations of 4.78 mg/L and 3.24 mg/L, respectively (see Figure 12). In no case does there appear to be a systematic spatial relationship between cadmium concentrations and the location of the tailings impoundments. We therefore conclude that cadmium concentrations at the site are the result of natural influences.

6.2.9 Nickel

Nickel concentrations at the site and in the region are generally low (Figure 13). The highest average concentrations at the site are in existing well MW-32 (61 µg/L) and in new well MW-28 (29 µg/L) and far downgradient well MW-3A (38 µg/L). In each case, the average concentrations are well below the GWQS of 100 µg/L. The fact that nickel concentrations are relatively low, that one of the highest concentrations is in far downgradient well MW-3A, and that there appears to be no particular spatial relationship that would suggest potential tailings cell seepage leads us to the conclusion that the nickel concentrations at the site are due to natural influences.

6.2.10 pH

Average pH levels at the site range from a high of 8.9 in MW-20 to a low of 6.7 in MW-28, with no particular spatial relationship that would suggest potential tailings cell seepage (Figure 14). Decreasing trends in pH at the site appears to be cyclical and typical of many wells at the site (see the discussion in Section 2.5.6). For these reasons we conclude that pH levels are the result of natural background influences.

6.2.11 Iron

Concentrations of iron at the site are variable and range from 8 µg/L in Well # 37 to 7,942 µg/L in MW-32 (Figure 15). Iron concentrations in all new wells are lower than the GWQS. Iron is relatively insoluble except at very low pH, severely limiting the concentration of iron that can travel in groundwater in the carbonate rich geologic environment beneath the tailings impoundments. Therefore, it is unlikely that a potential tailings cell leak would manifest itself in an increasing trend in iron in the absence of increasing trends in chloride, sulfate, fluoride, and uranium (see the discussion in Section 2.5.9).

6.2.12 Primary Indicator Parameters

Figure 16 presents average concentrations of four primary indicators of potential tailings impact: fluoride, chloride, sulfate and uranium. There is no consistent spatial relationship between these indicator parameters and the location of the tailings impoundments. For some constituents the highest observed values are upgradient of the Mill site. For others the highest observed values are far downgradient of the site. For still others the highest concentrations are both upgradient and far downgradient of the site.

7.0 CONCLUSIONS

All data from new monitoring wells fall within the range of pre-operational or regional background data as established by the April 2007 Addendum. An analysis of this new monitoring well data confirms the high variability of all constituents across the site and the region described in previous reports. There is no consistent spatial relationship between the primary indicator parameters and the location of the tailings impoundments. For some constituents the highest observed values are upgradient of the Mill site. For others the highest observed values are far downgradient of the site. For still others the highest concentrations are both upgradient and far downgradient of the site. It is therefore not possible to conclude that higher concentrations of constituents downgradient of the Mill site necessarily imply contamination from site activities. The data for the new wells are consistent with and reinforce our conclusions drawn from the existing wells and regional background.

Relatively high concentrations of nitrate in MW-30 and MW-31 and a rising trend in nitrate in MW-30 suggest that the plume from seepage from the leach fields that are the subject of the chloroform investigation is reaching those wells. While consistent with background in the region, relatively high concentrations of chloride in those wells may also be impacted from those leach fields.

We confirm our conclusions in the Background Report that, because Mill activities have not impacted background groundwater quality, setting the GWCLs in accordance with the Flow Sheet as set out on Table 10 will be appropriate for each constituent, subject to the general considerations discussed in Sections 2.3 and 2.4.

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Appendix A
Box Plots

Table 1
New Wells: Monitoring Parameters, Groundwater Quality Standards and Groundwater Quality Compliance Limits

Type	Analyte	Units	GWQS	MW-23 (Class III) GWCL	MW-24 (Class III) GWCL	MW-25 (Class II) GWCL	MW-27 (Class II) GWCL	MW-28 (Class III) GWCL	MW-29 (Class III) GWCL	MW-30 (Class II) GWCL	MW-31 (Class II) GWCL	MW-3A (Class III) GWCL
Nutrient	Ammonia, N	mg/L	25	12.5	12.5	6.25	6.25	12.5	12.5	6.25	6.25	12.5
Nutrient	Nitrate+Nitrite, N	mg/L	10	5	5	2.5	2.5	5	5	2.5	2.5	5
Metal	Arsenic	µg/L	50	25	25	12.5	12.5	25	25	12.5	12.5	25
Metal	Beryllium	µg/L	4	2	2	1	1	2	2	1	1	2
Metal	Cadmium	µg/L	5	2.5	2.5	1.25	1.25	2.5	2.5	1.25	1.25	2.5
Metal	Chromium	µg/L	100	50	50	25	25	50	50	25	25	50
Metal	Cobalt	µg/L	730	365	365	182.5	182.5	365	365	182.5	182.5	365
Metal	Copper	µg/L	1,300	650	650	325	325	650	650	325	325	650
Metal	Iron	µg/L	11,000	5500	5500	2750	2750	5500	5500	2750	2750	5500
Metal	Lead	µg/L	15	7.5	7.5	3.75	3.75	7.5	7.5	3.75	3.75	7.5
Metal	Manganese	µg/L	800	400	400	200	200	400	400	200	200	400
Metal	Mercury	µg/L	2	1	1	0.5	0.5	1	1	0.5	0.5	1
Metal	Molybdenum	µg/L	40	20	20	10	10	20	20	10	10	20
Metal	Nickel	µg/L	100	50	50	25	25	50	50	25	25	50
Metal	Selenium	µg/L	50	25	25	12.5	12.5	25	25	12.5	12.5	25
Metal	Silver	µg/L	100	50	50	25	25	50	50	25	25	50
Metal	Thallium	µg/L	2	1	1	0.5	0.5	1	1	0.5	0.5	1
Metal	Tin	µg/L	4000	2000	2000	1000	1000	2000	2000	1000	1000	2000
Metal	Uranium	µg/L	30	15	15	7.5	7.5	15	15	7.5	7.5	15
Metal	Vanadium	µg/L	60	30	30	15	15	30	30	15	15	30
Metal	Zinc	µg/L	5,000	2500	2500	1250	1250	2500	2500	1250	1250	2500
Radiologic	Gross Alpha	pCi/L	15	7.5	7.5	3.75	3.75	7.5	7.5	3.75	3.75	7.5
VOC	Acetone	µg/L	700	350	350	175	175	350	350	175	175	350
VOC	Benzene	µg/L	5	2.5	2.5	1.25	1.25	2.5	2.5	1.25	1.25	2.5
VOC	Methyl Ethyl Ketone	µg/L	4,000	2000	2000	1000	1000	2000	2000	1000	1000	2000
VOC	Carbon Tetrachloride	µg/L	5	2.5	2.5	1.25	1.25	2.5	2.5	1.25	1.25	2.5
VOC	Chloroform	µg/L	70	35	35	17.5	17.5	35	35	17.5	17.5	35
VOC	Chloromethane	µg/L	30	15	15	7.5	7.5	15	15	7.5	7.5	15
VOC	Dichloromethane	µg/L	5	2.5	2.5	1.25	1.25	2.5	2.5	1.25	1.25	2.5
VOC	Naphthalene	µg/L	100	50	50	25	25	50	50	25	25	50
VOC	Tetrahydrofuran	µg/L	46	23	23	11.5	11.5	23	23	11.5	11.5	23
VOC	Toluene	µg/L	1,000	500	500	250	250	500	500	250	250	500
VOC	Total Xylenes	µg/L	10,000	5000	5000	2500	2500	5000	5000	2500	2500	5000
Other	Chloride	mg/L	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Other	Fluoride	mg/L	4	2	2	1	1	2	2	1	1	2
Other	Field pH	pH	6.5 to 8.5	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Other	Sulfate	mg/L	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Other	TDS	mg/L	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Notes:

GWQS = Groundwater quality standard
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
µg/L = Micrograms per liter

GWCL = Groundwater compliance limit
VOC = Volatile organic compound
MEK = Methyl ethyl ketone
TDS = Total dissolved solids

Class = Classification of groundwater based on TDS content
Class II = TDS from 500 to 3,000 mg/L
Class III = TDS from 3,000 to 10,000 mg/L

TBD = To be determined (defined as the value of the arithmetic mean plus two standard deviations)

Table 2a
Descriptive Summary Statistics for Constituents in New Wells with Greater than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-3A	Chloromethane	ug/L	6	8	75.0%	2.8	2.0	2.1	1.0	2.8	4.4	0.5	5.8	5.3	0.5
All	MW-23	Ammonia	mg/L	7	10	70.0%	0.2	0.1	0.2	0.0	0.1	0.3	0.0	0.6	0.6	1.2
Without extremes	MW-24	Ammonia	mg/L	9	9	100.0%	3.3	2.8	1.9	1.8	2.8	5.0	0.9	5.8	4.9	0.0
With extremes	MW-24	Ammonia	mg/L	10	10	100.0%	6.6	3.6	10.4	1.8	3.7	5.3	0.9	35.8	34.9	3.0
All	MW-25	Ammonia	mg/L	10	10	100.0%	0.6	0.6	0.1	0.5	0.6	0.7	0.5	0.7	0.2	-0.5
All	MW-28	Ammonia	mg/L	9	10	90.0%	0.2	0.1	0.1	0.1	0.2	0.3	0.0	0.3	0.2	-0.6
All	MW-29	Ammonia	mg/L	9	9	100.0%	1.0	1.0	0.1	0.9	1.0	1.1	0.8	1.2	0.4	-0.2
All	MW-30	Ammonia	mg/L	5	9	55.6%	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.6
All	MW-3A	Ammonia	mg/L	7	9	77.8%	0.2	0.1	0.2	0.1	0.2	0.3	0.0	0.6	0.6	1.3
All	MW-24	Arsenic	ug/L	7	12	58.3%	6.3	5.0	5.1	2.5	5.7	7.7	2.5	20.4	17.9	2.1
Without extremes	MW-28	Arsenic	ug/L	10	10	100.0%	14.8	14.6	2.9	12.3	15.2	17.4	9.7	18.6	8.9	-0.4
With extremes	MW-28	Arsenic	ug/L	11	11	100.0%	17.3	16.0	8.6	12.3	15.4	17.9	9.7	41.9	32.2	2.7
Without extremes	MW-25	Cadmium	ug/L	10	10	100.0%	1.4	1.4	0.1	1.4	1.4	1.4	1.3	1.5	0.2	-0.4
With extremes	MW-25	Cadmium	ug/L	11	11	100.0%	1.5	1.5	0.4	1.4	1.4	1.5	1.3	2.8	1.5	3.2
All	MW-28	Cadmium	ug/L	11	11	100.0%	3.3	3.1	1.0	2.7	3.4	3.9	1.6	4.7	3.1	-0.6
All	MW-3A	Cadmium	ug/L	6	9	66.7%	2.2	1.2	2.5	0.3	1.5	1.8	0.3	6.9	6.6	1.4
Without extremes	MW-23	Chloride	mg/L	10	11	90.9%	6.4	5.3	2.7	6.0	7.0	8.0	0.5	10.0	9.5	-1.1
With extremes	MW-23	Chloride	mg/L	11	12	91.7%	8.5	6.1	7.8	6.0	7.0	8.5	0.5	32.0	31.5	2.8
All	MW-24	Chloride	mg/L	10	10	100.0%	50.2	49.6	9.1	45.0	45.5	52.0	44.0	71.0	27.0	1.8
All	MW-25	Chloride	mg/L	11	11	100.0%	32.4	32.3	1.2	32.0	32.0	33.0	30.0	34.0	4.0	-0.4
All	MW-27	Chloride	mg/L	10	10	100.0%	34.7	34.7	1.6	34.0	34.5	36.0	32.0	37.0	5.0	0.0
All	MW-28	Chloride	mg/L	11	11	100.0%	89.1	88.7	8.2	83.0	91.0	96.0	73.0	99.0	26.0	-0.7
All	MW-29	Chloride	mg/L	10	10	100.0%	38.3	38.3	1.6	37.0	38.5	39.0	36.0	41.0	5.0	0.2
Without extremes	MW-30	Chloride	mg/L	9	9	100.0%	124.9	124.9	1.6	124.0	125.0	125.0	122.0	128.0	6.0	0.2
With extremes	MW-30	Chloride	mg/L	10	10	100.0%	124.2	124.2	2.7	124.0	125.0	125.0	118.0	128.0	10.0	-1.4
All	MW-31	Chloride	mg/L	10	10	100.0%	132.9	132.8	5.2	131.0	134.0	136.0	122.0	139.0	17.0	-1.1
All	MW-3A	Chloride	mg/L	9	9	100.0%	61.4	61.3	4.1	60.0	61.0	63.0	56.0	70.0	14.0	0.9
All	MW-23	Chloromethane	ug/L	6	12	50.0%	1.9	1.2	1.8	0.5	1.2	2.9	0.5	6.2	5.7	1.4
All	MW-28	Chloromethane	ug/L	6	11	54.5%	1.7	1.2	1.3	0.5	1.0	2.9	0.5	4.0	3.5	0.5
All	MW-31	Chloromethane	ug/L	5	9	55.6%	1.9	1.2	2.0	0.5	1.3	2.1	0.5	5.9	5.4	1.4
All	MW-25	Cobalt	ug/L	8	11	72.7%	9.4	8.8	3.2	5.0	10.0	11.0	5.0	15.0	10.0	-0.2
All	MW-28	Cobalt	ug/L	11	11	100.0%	31.3	30.2	7.8	28.0	31.0	36.0	15.0	44.0	29.0	-0.5
All	MW-23	Fluoride	mg/L	11	11	100.0%	0.3	0.2	0.2	0.2	0.3	0.4	0.1	0.8	0.8	1.7
All	MW-24	Fluoride	mg/L	11	11	100.0%	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.4	0.2	0.5
All	MW-25	Fluoride	mg/L	11	11	100.0%	0.3	0.3	0.0	0.3	0.3	0.4	0.3	0.4	0.2	1.1
All	MW-27	Fluoride	mg/L	10	10	100.0%	0.7	0.7	0.0	0.7	0.7	0.8	0.7	0.8	0.1	0.4
All	MW-28	Fluoride	mg/L	11	11	100.0%	0.6	0.6	0.0	0.6	0.6	0.7	0.6	0.7	0.1	-0.8
All	MW-29	Fluoride	mg/L	10	10	100.0%	0.9	0.8	0.1	0.8	0.8	0.9	0.7	1.1	0.4	1.2
All	MW-30	Fluoride	mg/L	10	10	100.0%	0.4	0.4	0.1	0.3	0.4	0.4	0.3	0.5	0.2	0.6
All	MW-31	Fluoride	mg/L	10	10	100.0%	0.9	0.9	0.1	0.9	0.9	0.9	0.8	1.2	0.4	1.9
Without extremes	MW-3A	Fluoride	mg/L	8	8	100.0%	1.3	1.3	0.2	1.1	1.2	1.4	1.1	1.6	0.5	0.8
With extremes	MW-3A	Fluoride	mg/L	8	9	88.8%	1.3	0.7	0.5	1.1	1.2	1.4	0.0	1.6	1.6	-2.2

Notes:

Type = All - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
Without Extremes - Extreme values have been removed from data set.
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2a
Descriptive Summary Statistics for Constituents in New Wells with Greater than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
Without extremes	MW-23	Gross Alpha minus Rn & U	pCi/L	8	10	80.0%	1.4	1.2	0.6	1.0	1.4	1.8	0.5	2.3	1.8	-0.1
With extremes	MW-23	Gross Alpha minus Rn & U	pCi/L	8	11	72.7%	1.3		0.7	0.5	1.3	1.8	0.0	2.3	2.3	-0.3
Without extremes	MW-27	Gross Alpha minus Rn & U	pCi/L	6	9	66.7%	1.0	0.9	0.4	0.5	1.1	1.2	0.5	1.5	1.0	-0.3
With extremes	MW-27	Gross Alpha minus Rn & U	pCi/L	6	10	60.0%	0.9		0.5	0.5	1.1	1.2	0.0	1.5	1.5	-0.6
Without extremes	MW-28	Gross Alpha minus Rn & U	pCi/L	8	10	80.0%	1.2	1.1	0.5	1.0	1.2	1.5	0.5	2.0	1.5	-0.1
With extremes	MW-28	Gross Alpha minus Rn & U	pCi/L	8	11	72.7%	1.1		0.6	0.5	1.2	1.5	0.0	2.0	2.0	-0.5
Without extremes	MW-29	Gross Alpha minus Rn & U	pCi/L	5	9	55.6%	1.1	0.9	0.8	0.5	1.1	1.4	0.5	2.8	2.3	1.3
With extremes	MW-29	Gross Alpha minus Rn & U	pCi/L	5	10	50.0%	1.0		0.8	0.5	0.8	1.4	0.0	2.8	2.8	1.1
Without extremes	MW-24	Iron	ug/L	11	11	100.0%	1252.6	517.3	1454.9	101.0	823.0	2140.0	32.0	4730.0	4698.0	1.5
With extremes	MW-24	Iron	ug/L	12	12	100.0%	2006.6	663.7	2957.3	173.0	856.0	2230.0	32.0	10300.0	10268.0	2.3
All	MW-28	Iron	ug/L	9	11	81.8%	97.4	63.7	91.7	43.0	47.0	206.0	15.0	277.0	262.0	1.1
All	MW-29	Iron	ug/L	10	10	100.0%	1252.9	1219.1	308.2	961.0	1225.0	1500.0	840.0	1790.0	950.0	0.4
All	MW-30	Iron	ug/L	9	10	90.0%	75.6	61.4	44.0	34.0	76.5	122.0	15.0	127.0	112.0	-0.1
Without extremes	MW-23	Manganese	ug/L	9	9	100.0%	302.9	279.3	123.4	180.0	281.0	421.0	154.0	472.0	318.0	0.1
With extremes	MW-23	Manganese	ug/L	11	11	100.0%	666.9	408.8	836.2	180.0	337.0	472.0	154.0	2700.0	2546.0	2.0
All	MW-24	Manganese	ug/L	12	12	100.0%	3535.0	3125.1	1986.1	2155.0	2655.0	4330.0	1670.0	7640.0	5970.0	1.3
All	MW-25	Manganese	ug/L	11	11	100.0%	1697.3	1696.5	54.6	1670.0	1710.0	1740.0	1590.0	1760.0	170.0	-1.1
All	MW-28	Manganese	ug/L	11	11	100.0%	1528.2	1520.7	154.5	1450.0	1550.0	1600.0	1180.0	1800.0	620.0	-0.7
Without extremes	MW-29	Manganese	ug/L	9	9	100.0%	5027.8	5020.3	298.3	4800.0	4940.0	5110.0	4750.0	5720.0	970.0	1.7
With extremes	MW-29	Manganese	ug/L	10	10	100.0%	7025.0	5894.5	6322.0	4800.0	4985.0	5180.0	4750.0	25000.0	20250.0	3.2
All	MW-30	Manganese	ug/L	9	10	90.0%	30.4	25.6	15.5	19.0	29.0	44.0	5.0	54.0	49.0	0.0
All	MW-3A	Manganese	ug/L	9	9	100.0%	1772.9	568.9	2257.3	225.0	264.0	2400.0	22.0	6520.0	6498.0	1.4
Without extremes	MW-25	Molybdenum	ug/L	10	10	100.0%	10.5	10.5	0.7	10.0	10.0	11.0	10.0	12.0	2.0	1.2
With extremes	MW-25	Molybdenum	ug/L	10	11	90.9%	10.0	9.8	1.8	10.0	10.0	11.0	5.0	12.0	7.0	-2.4
All	MW-28	Nickel	ug/L	10	11	90.9%	28.6	27.4	7.2	26.0	30.0	32.0	10.0	36.0	26.0	-1.9
All	MW-3A	Nickel	ug/L	5	9	55.6%	38.2	26.2	31.0	10.0	26.0	60.0	10.0	82.0	72.0	0.4
Without extremes	MW-23	Nitrate+Nitrite as N	mg/L	9	9	100.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.2	0.3	0.1	-3.0
With extremes	MW-23	Nitrate+Nitrite as N	mg/L	10	13	76.9%	0.3	0.2	0.1	0.3	0.3	0.3	0.0	0.6	0.6	0.1
All	MW-27	Nitrate+Nitrite as N	mg/L	10	10	100.0%	5.1	5.0	0.3	4.8	5.1	5.2	4.7	5.6	0.9	0.6
All	MW-28	Nitrate+Nitrite as N	mg/L	11	12	91.7%	0.2	0.1	0.1	0.1	0.2	0.2	0.0	0.4	0.4	0.9
Without extremes	MW-30	Nitrate+Nitrite as N	mg/L	10	10	100.0%	14.0	13.9	0.8	13.6	14.3	14.6	12.4	14.9	2.5	-1.0
With extremes	MW-30	Nitrate+Nitrite as N	mg/L	11	11	100.0%	12.7	8.7	4.3	12.8	14.1	14.6	0.1	14.9	14.8	-3.1
All	MW-31	Nitrate+Nitrite as N	mg/L	10	10	100.0%	23.9	23.9	1.1	23.3	24.2	24.6	22.0	25.3	3.3	-0.7
Without extremes	MW-3A	Nitrate+Nitrite as N	mg/L	8	8	100.0%	1.0	1.0	0.2	0.9	1.0	1.2	0.8	1.2	0.4	0.0
With extremes	MW-3A	Nitrate+Nitrite as N	mg/L	8	9	88.9%	0.9	0.7	0.4	0.8	1.0	1.1	0.1	1.2	1.2	-2.0
All	MW-23	pH	s.u.	10	10	100.0%	7.3	7.3	0.3	7.1	7.2	7.4	6.9	7.9	0.9	0.8
All	MW-24	pH	s.u.	10	10	100.0%	7.2	7.2	0.2	7.0	7.2	7.3	6.9	7.7	0.8	0.4
All	MW-25	pH	s.u.	10	10	100.0%	7.2	7.2	0.2	7.1	7.2	7.4	6.9	7.6	0.7	-0.1
All	MW-27	pH	s.u.	9	9	100.0%	7.7	7.6	0.2	7.6	7.6	7.8	7.4	7.9	0.5	0.5
All	MW-28	pH	s.u.	11	11	100.0%	6.7	6.7	0.3	6.5	6.7	6.9	6.3	7.4	1.1	0.7
All	MW-29	pH	s.u.	9	9	100.0%	7.0	7.0	0.3	6.9	7.0	7.2	6.5	7.3	0.7	-0.8

Notes:

Type = All - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
Without Extremes - Extreme values have been removed from data set.
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2a
Descriptive Summary Statistics for Constituents in New Wells with Greater than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-30	pH	s.u.	9	9	100.0%	7.4	7.4	0.3	7.2	7.3	7.5	6.9	7.9	1.0	0.1
All	MW-31	pH	s.u.	9	9	100.0%	7.5	7.5	0.4	7.3	7.6	7.7	6.8	7.9	1.1	-1.1
All	MW-3A	pH	s.u.	8	8	100.0%	7.2	7.2	0.2	7.0	7.2	7.4	6.9	7.5	0.6	0.0
All	MW-23	Selenium	ug/L	7	11	63.6%	4.4	4.1	1.6	2.5	5.2	5.5	2.5	6.5	4.0	-0.4
All	MW-27	Selenium	ug/L	10	10	100.0%	10.7	10.7	0.7	10.1	10.8	11.5	9.7	11.9	2.2	0.2
All	MW-28	Selenium	ug/L	8	11	72.7%	5.4	5.0	2.1	2.5	5.5	7.6	2.5	8.0	5.5	-0.4
All	MW-30	Selenium	ug/L	10	10	100.0%	30.7	30.7	1.8	29.1	30.5	31.3	28.6	34.6	6.0	1.0
All	MW-31	Selenium	ug/L	10	10	100.0%	62.6	62.5	4.2	59.2	62.4	65.8	56.6	70.1	13.5	0.5
Without extremes	MW-3A	Selenium	ug/L	8	8	100.0%	71.8	71.3	8.7	67.7	74.0	77.4	54.4	81.7	27.3	-1.2
With extremes	MW-3A	Selenium	ug/L	8	9	88.9%	64.1	49.1	24.5	64.2	73.9	75.6	2.5	81.7	79.2	-2.4
Without extremes	MW-23	Sulfate	mg/L	10	10	100.0%	2224.0	2219.4	150.2	2100.0	2260.0	2320.0	1950.0	2460.0	510.0	-0.4
With extremes	MW-23	Sulfate	mg/L	11	11	100.0%	2101.4	2039.3	431.0	2090.0	2240.0	2320.0	875.0	2460.0	1585.0	-2.7
All	MW-24	Sulfate	mg/L	11	11	100.0%	2594.5	2590.3	154.4	2470.0	2620.0	2680.0	2290.0	2850.0	560.0	-0.4
All	MW-25	Sulfate	mg/L	11	11	100.0%	1729.1	1726.4	101.8	1670.0	1710.0	1850.0	1570.0	1880.0	310.0	0.1
All	MW-27	Sulfate	mg/L	10	10	100.0%	405.2	404.3	28.4	398.0	404.5	420.0	360.0	452.0	92.0	-0.3
Without extremes	MW-28	Sulfate	mg/L	10	10	100.0%	2361.0	2359.6	85.8	2320.0	2365.0	2380.0	2190.0	2520.0	330.0	-0.2
With extremes	MW-28	Sulfate	mg/L	11	11	100.0%	2329.1	2325.4	133.5	2310.0	2360.0	2380.0	2010.0	2520.0	510.0	-1.4
All	MW-29	Sulfate	mg/L	10	10	100.0%	2785.0	2784.0	80.7	2720.0	2775.0	2790.0	2700.0	2980.0	280.0	1.7
All	MW-30	Sulfate	mg/L	10	10	100.0%	883.2	882.2	44.5	852.0	873.5	910.0	822.0	977.0	155.0	0.8
All	MW-31	Sulfate	mg/L	10	10	100.0%	504.3	503.6	27.8	497.0	512.5	522.0	436.0	532.0	96.0	-1.9
Without extremes	MW-3A	Sulfate	mg/L	8	8	100.0%	3455.0	3453.9	92.4	3410.0	3480.0	3515.0	3270.0	3560.0	290.0	-1.2
With extremes	MW-3A	Sulfate	mg/L	9	9	100.0%	3494.4	3491.8	146.6	3440.0	3490.0	3520.0	3270.0	3810.0	540.0	1.0
Without extremes	MW-23	TDS	mg/L	10	10	100.0%	3443.0	3434.7	243.8	3440.0	3520.0	3630.0	2920.0	3670.0	750.0	-1.5
With extremes	MW-23	TDS	mg/L	11	11	100.0%	3260.9	3173.7	646.7	3100.0	3520.0	3630.0	1440.0	3670.0	2230.0	-2.6
Without extremes	MW-24	TDS	mg/L	10	10	100.0%	4116.0	4112.9	166.9	3980.0	4165.0	4200.0	3820.0	4340.0	520.0	-0.7
With extremes	MW-24	TDS	mg/L	11	11	100.0%	4006.4	3985.6	396.6	3890.0	4160.0	4200.0	2910.0	4340.0	1430.0	-2.4
All	MW-25	TDS	mg/L	11	11	100.0%	2842.7	2842.0	66.5	2800.0	2850.0	2890.0	2740.0	2970.0	230.0	0.2
All	MW-27	TDS	mg/L	10	10	100.0%	1019.4	1019.1	27.8	1010.0	1020.0	1040.0	954.0	1050.0	96.0	-1.4
All	MW-28	TDS	mg/L	11	11	100.0%	3677.3	3676.3	87.3	3600.0	3700.0	3770.0	3540.0	3800.0	260.0	-0.1
Without extremes	MW-29	TDS	mg/L	8	8	100.0%	4380.0	4379.9	26.7	4375.0	4385.0	4400.0	4320.0	4400.0	80.0	-1.9
With extremes	MW-29	TDS	mg/L	10	10	100.0%	4381.0	4380.5	67.9	4370.0	4385.0	4400.0	4250.0	4520.0	270.0	0.1
All	MW-30	TDS	mg/L	10	10	100.0%	1745.0	1743.1	86.7	1690.0	1720.0	1790.0	1650.0	1940.0	290.0	1.3
All	MW-31	TDS	mg/L	10	10	100.0%	1265.0	1264.1	49.5	1240.0	1280.0	1290.0	1150.0	1320.0	170.0	-1.6
All	MW-3A	TDS	mg/L	9	9	100.0%	5547.8	5546.5	128.5	5490.0	5540.0	5580.0	5360.0	5770.0	410.0	0.4
All	MW-25	Thallium	ug/L	11	11	100.0%	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.1	0.1	-0.2
All	MW-28	Thallium	ug/L	11	11	100.0%	0.9	0.9	0.1	0.8	0.9	0.9	0.7	1.0	0.2	-0.1
All	MW-3A	Thallium	ug/L	7	9	77.8%	0.7	0.6	0.3	0.5	0.7	0.9	0.3	1.0	0.8	-0.6
Without extremes	MW-23	Uranium	ug/L	10	10	100.0%	23.2	22.9	4.2	20.7	21.7	24.6	19.4	31.8	12.4	1.4
With extremes	MW-23	Uranium	ug/L	11	11	100.0%	28.3	25.7	17.3	20.7	22.1	29.5	19.4	78.9	59.5	3.0
Without extremes	MW-24	Uranium	ug/L	10	10	100.0%	9.0	4.8	13.4	2.1	4.4	9.7	1.5	46.0	44.5	2.8
With extremes	MW-24	Uranium	ug/L	12	12	100.0%	36.6	8.7	68.8	2.1	6.4	28.2	1.5	223.0	221.5	2.3

Notes:

Type = All - Entire data set. Data set did not contain extremes.

With Extremes - Entire data set. Data set did contain extremes.

Without Extremes - Extreme values have been removed from data set.

Well = Monitoring well location

Detects = Number of detections

N = Number of samples

%Det = Detection rate as a percentage

**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.

**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.

Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)

Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population

Q75 = 75th percentile of the sample population

MaxConc = Maximum concentration

MinConc = Minimum concentration

ug/L = Micrograms per liter

mg/L = Milligrams per liter

pCi/L = Picocuries per liter

Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)

TDS = Total dissolved solids

N/A = Not Applicable, due to lack of detections

Table 2a

Descriptive Summary Statistics for Constituents in New Wells with Greater than 50% Detects

N Greater Than 8																	
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-25	Uranium	ug/L	11	11	100.0%	5.9	5.9	0.3	5.9	6.0	6.0	5.4	6.4	0.9	-0.5
All	MW-27	Uranium	ug/L	10	10	100.0%	31.4	31.4	1.1	30.7	31.6	32.2	29.5	33.1	3.6	-0.2
All	MW-28	Uranium	ug/L	11	11	100.0%	3.7	3.6	0.6	3.4	3.5	3.9	2.7	4.9	2.2	0.8
Without extremes	MW-29	Uranium	ug/L	8	8	100.0%	11.2	11.2	0.8	11.1	11.3	11.8	9.5	12.1	2.6	-1.6
With extremes	MW-29	Uranium	ug/L	10	10	100.0%	14.7	12.6	12.1	11.1	11.3	11.9	8.1	49.0	40.9	3.1
All	MW-30	Uranium	ug/L	10	10	100.0%	7.0	7.0	0.6	6.9	7.1	7.3	5.8	8.0	2.2	-0.5
All	MW-31	Uranium	ug/L	10	10	100.0%	7.6	7.6	0.7	7.2	7.4	8.0	6.6	9.3	2.8	1.2
Without extremes	MW-3A	Uranium	ug/L	8	8	100.0%	24.7	24.3	5.1	20.9	23.6	26.8	19.7	35.2	15.5	1.4
With extremes	MW-3A	Uranium	ug/L	8	9	88.9%	22.0	13.8	9.5	19.9	22.9	25.4	0.2	35.2	35.1	-1.5
Without extremes	MW-23	Zinc	ug/L	10	10	100.0%	36.7	32.8	18.6	30.0	32.0	41.0	10.0	82.0	72.0	1.6
With extremes	MW-23	Zinc	ug/L	11	11	100.0%	60.3	40.0	80.1	30.0	33.0	46.0	10.0	296.0	286.0	3.0
With extremes	MW-24	Zinc	ug/L	6	12	50.0%	17.9	10.0	29.1	5.0	7.5	16.0	5.0	108.0	103.0	3.2
All	MW-28	Zinc	ug/L	11	11	100.0%	46.4	43.1	18.3	33.0	47.0	53.0	18.0	80.0	62.0	0.7
Without extremes	MW-29	Zinc	ug/L	8	9	88.9%	15.1	13.7	7.3	13.0	14.0	15.0	5.0	32.0	27.0	1.6
With extremes	MW-29	Zinc	ug/L	9	10	90.0%	18.0	15.4	11.4	13.0	14.5	18.0	5.0	44.0	39.0	1.6
All	MW-3A	Zinc	ug/L	9	9	100.0%	71.9	60.9	41.4	40.0	65.0	106.0	21.0	141.0	120.0	0.5

Notes:

Type = All - Entire data set. Data set did not contain extremes.

With Extremes - Entire data set. Data set did contain extremes.

Without Extremes - Extreme values have been removed from data set.

Well = Monitoring well location

Detects = Number of detections

N = Number of samples

%Det = Detection rate as a percentage

**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.

**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.

Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)

Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population

Q75 = 75th percentile of the sample population

MaxConc = Maximum concentration

MinConc = Minimum concentration

ug/L = Micrograms per liter

mg/L = Milligrams per liter

pCi/L = Picocuries per liter

Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)

TDS = Total dissolved solids

N/A = Not Applicable, due to lack of detections

Table 2b
Descriptive Summary Statistics for Constituents in New Wells with Less than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-23	2-Butanone (MEK)	ug/L	0	13	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
With extremes	MW-24	2-Butanone (MEK)	ug/L	1	12	8.3%	11.0	10.7	3.5	10.0	10.0	10.0	10.0	22.0	12.0	3.5
Without extremes	MW-24	2-Butanone (MEK)	ug/L	0	11	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-25	2-Butanone (MEK)	ug/L	0	11	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-27	2-Butanone (MEK)	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-28	2-Butanone (MEK)	ug/L	0	11	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-29	2-Butanone (MEK)	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-30	2-Butanone (MEK)	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-31	2-Butanone (MEK)	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-3A	2-Butanone (MEK)	ug/L	0	9	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-23	Acetone	ug/L	0	12	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
With extremes	MW-24	Acetone	ug/L	3	12	25.0%	114.4	22.0	240.7	10.0	10.0	21.5	10.0	700.0	690.0	2.1
Without extremes	MW-24	Acetone	ug/L	1	10	10.0%	12.3	11.3	7.3	10.0	10.0	10.0	10.0	33.0	23.0	3.2
All	MW-25	Acetone	ug/L	0	11	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-27	Acetone	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-28	Acetone	ug/L	0	11	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-29	Acetone	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-30	Acetone	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-31	Acetone	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-3A	Acetone	ug/L	0	9	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
With extremes	MW-27	Ammonia	mg/L	2	9	22.2%	0.034	0.031	0.019	0.025	0.025	0.025	0.025	0.080	0.055	2.221
With extremes	MW-31	Ammonia	mg/L	2	9	22.2%	0.031	0.029	0.011	0.025	0.025	0.025	0.025	0.050	0.025	1.620
All	MW-23	Arsenic	ug/L	0	11	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
All	MW-25	Arsenic	ug/L	0	11	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
All	MW-27	Arsenic	ug/L	0	10	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
With extremes	MW-29	Arsenic	ug/L	1	10	10.0%	4.3	3.1	5.8	2.5	2.5	2.5	2.5	20.7	18.2	3.2
Without extremes	MW-29	Arsenic	ug/L	0	9	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
All	MW-30	Arsenic	ug/L	0	10	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
All	MW-31	Arsenic	ug/L	0	10	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
All	MW-3A	Arsenic	ug/L	0	9	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
All	MW-23	Benzene	ug/L	0	13	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-24	Benzene	ug/L	0	12	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Benzene	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-27	Benzene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-28	Benzene	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-29	Benzene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-30	Benzene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Benzene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-3A	Benzene	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-23	Beryllium	ug/L	0	11	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
With extremes	MW-24	Beryllium	ug/L	1	12	8.3%	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.3	1.1	3.5
Without extremes	MW-24	Beryllium	ug/L	0	11	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-25	Beryllium	ug/L	0	11	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-27	Beryllium	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0

Notes:

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With Extremes - Entire data set. Data set did contain extremes.
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Well = Monitoring well location
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**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2b
Descriptive Summary Statistics for Constituents in New Wells with Less than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-28	Beryllium	ug/L	0	11	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
With extremes	MW-29	Beryllium	ug/L	1	10	10.0%	0.4	0.3	0.5	0.3	0.3	0.3	0.3	1.8	1.5	3.2
Without extremes	MW-29	Beryllium	ug/L	0	9	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-30	Beryllium	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-31	Beryllium	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-3A	Beryllium	ug/L	4	9	44.4%	0.6	0.5	0.4	0.3	0.3	1.0	0.3	1.3	1.1	0.6
With extremes	MW-23	Cadmium	ug/L	3	11	27.3%	0.5	0.4	0.3	0.3	0.3	0.8	0.3	1.2	1.0	1.3
Without extremes	MW-23	Cadmium	ug/L	3	10	30.0%	0.4	0.4	0.3	0.3	0.3	0.6	0.3	1.2	1.0	1.8
With extremes	MW-24	Cadmium	ug/L	2	12	16.7%	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.7	0.5	1.5
Without extremes	MW-24	Cadmium	ug/L	1	9	11.1%	0.3	0.3	0.1	0.3	0.3	0.3	0.3	0.6	0.3	3.0
All	MW-27	Cadmium	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
With extremes	MW-29	Cadmium	ug/L	1	10	10.0%	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.9	0.6	2.9
Without extremes	MW-29	Cadmium	ug/L	0	9	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.4	0.1	1.6
With extremes	MW-30	Cadmium	ug/L	1	10	10.0%	0.4	0.3	0.3	0.3	0.3	0.3	0.3	1.3	1.0	3.2
Without extremes	MW-30	Cadmium	ug/L	0	9	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-31	Cadmium	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-23	Carbon tetrachloride	ug/L	0	13	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-24	Carbon tetrachloride	ug/L	0	12	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Carbon tetrachloride	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-27	Carbon tetrachloride	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-28	Carbon tetrachloride	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-29	Carbon tetrachloride	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-30	Carbon tetrachloride	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Carbon tetrachloride	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-3A	Carbon tetrachloride	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-23	Chloroform	ug/L	0	13	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-24	Chloroform	ug/L	0	12	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Chloroform	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-27	Chloroform	ug/L	1	10	10.0%	1.0	0.6	1.6	0.5	0.5	0.5	0.5	5.6	5.1	3.2
Without extremes	MW-27	Chloroform	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-28	Chloroform	ug/L	1	12	8.3%	22.1	0.8	74.9	0.5	0.5	0.5	0.5	260.0	259.5	3.5
Without extremes	MW-28	Chloroform	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-29	Chloroform	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-30	Chloroform	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Chloroform	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-3A	Chloroform	ug/L	2	9	22.2%	1.2	0.8	1.4	0.5	0.5	0.5	0.5	4.4	3.9	2.0
All	MW-24	Chloromethane	ug/L	5	11	45.5%	2.8	1.4	3.0	0.5	0.5	5.6	0.5	8.6	8.1	1.0
All	MW-25	Chloromethane	ug/L	4	10	40.0%	1.6	1.0	1.8	0.5	0.5	2.2	0.5	5.8	5.3	1.7
All	MW-27	Chloromethane	ug/L	4	9	44.4%	1.6	1.1	1.5	0.5	0.5	2.7	0.5	4.4	3.9	1.0
All	MW-29	Chloromethane	ug/L	4	9	44.4%	2.6	1.4	2.8	0.5	0.5	4.2	0.5	8.2	7.7	1.2
All	MW-30	Chloromethane	ug/L	4	9	44.4%	1.3	1.0	1.0	0.5	0.5	2.2	0.5	3.1	2.6	0.9
With extremes	MW-23	Chromium	ug/L	0	12	0.0%	12.1	12.0	1.0	12.5	12.5	12.5	10.0	12.5	2.5	-2.1
Without extremes	MW-23	Chromium	ug/L	0	10	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
With extremes	MW-24	Chromium	ug/L	0	12	0.0%	13.5	13.2	3.6	12.5	12.5	12.5	12.5	25.0	12.5	3.5

Notes:

Type = <u>All</u> - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
Without Extremes - Extreme values have been removed from data set.
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
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Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
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pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2b
Descriptive Summary Statistics for Constituents in New Wells with Less than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
Without extremes	MW-24	Chromium	ug/L	0	11	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
All	MW-25	Chromium	ug/L	0	11	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
All	MW-27	Chromium	ug/L	0	10	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
All	MW-28	Chromium	ug/L	0	11	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
All	MW-29	Chromium	ug/L	0	10	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
All	MW-30	Chromium	ug/L	0	10	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
With extremes	MW-31	Chromium	ug/L	0	10	0.0%	12.3	12.2	0.8	12.5	12.5	12.5	10.0	12.5	2.5	-3.2
Without extremes	MW-31	Chromium	ug/L	0	9	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
With extremes	MW-3A	Chromium	ug/L	0	10	0.0%	12.5		5.9	12.5	12.5	12.5	0.0	25.0	25.0	0.0
Without extremes	MW-3A	Chromium	ug/L	0	8	0.0%	12.5	12.5	0.0	12.5	12.5	12.5	12.5	12.5	0.0	0.0
With extremes	MW-23	Cobalt	ug/L	1	11	9.1%	6.7	5.8	5.7	5.0	5.0	5.0	5.0	24.0	19.0	3.3
Without extremes	MW-23	Cobalt	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
With extremes	MW-24	Cobalt	ug/L	3	12	25.0%	7.8	6.6	5.8	5.0	5.0	8.0	5.0	24.0	19.0	2.4
Without extremes	MW-24	Cobalt	ug/L	2	11	18.2%	6.3	5.9	2.9	5.0	5.0	5.0	5.0	13.0	8.0	2.0
All	MW-27	Cobalt	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
With extremes	MW-29	Cobalt	ug/L	0	10	0.0%	5.5	5.3	1.4	5.0	5.0	5.0	5.0	9.5	4.5	3.2
Without extremes	MW-29	Cobalt	ug/L	0	9	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-30	Cobalt	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-31	Cobalt	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-3A	Cobalt	ug/L	3	9	33.3%	11.9	8.3	12.0	5.0	5.0	12.0	5.0	36.0	31.0	1.6
All	MW-23	Copper	ug/L	0	11	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-24	Copper	ug/L	0	12	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-25	Copper	ug/L	0	11	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-27	Copper	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-28	Copper	ug/L	0	11	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-29	Copper	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-30	Copper	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-31	Copper	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
With extremes	MW-3A	Copper	ug/L	1	9	11.1%	6.0	5.6	3.0	5.0	5.0	5.0	5.0	14.0	9.0	3.0
Without extremes	MW-3A	Copper	ug/L	0	8	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-23	Dichloromethane	ug/L	0	13	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-24	Dichloromethane	ug/L	0	12	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Dichloromethane	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-27	Dichloromethane	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-28	Dichloromethane	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-29	Dichloromethane	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-30	Dichloromethane	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Dichloromethane	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-3A	Dichloromethane	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-24	Gross Alpha minus Rn & U	pCi/L	3	11	27.3%	1.1	0.8	1.1	0.5	0.5	1.7	0.5	4.1	3.6	2.2
With extremes	MW-25	Gross Alpha minus Rn & U	pCi/L	2	11	18.2%	0.6		0.4	0.5	0.5	0.5	0.0	1.4	1.4	1.2
Without extremes	MW-25	Gross Alpha minus Rn & U	pCi/L	2	10	20.0%	0.6	0.6	0.3	0.5	0.5	0.5	0.5	1.4	0.9	2.2
With extremes	MW-30	Gross Alpha minus Rn & U	pCi/L	2	10	20.0%	0.7		0.5	0.5	0.5	0.5	0.0	1.8	1.8	1.5
Without extremes	MW-30	Gross Alpha minus Rn & U	pCi/L	2	9	22.2%	0.7	0.6	0.5	0.5	0.5	0.5	0.5	1.8	1.3	1.9

Notes:

Type = All - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
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Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2b
Descriptive Summary Statistics for Constituents in New Wells with Less than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
With extremes	MW-31	Gross Alpha minus Rn & U	pCi/L	1	10	10.0%	0.7	0.6	0.5	0.5	0.5	0.5	0.5	1.9	1.4	2.4
Without extremes	MW-31	Gross Alpha minus Rn & U	pCi/L	0	8	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-3A	Gross Alpha minus Rn & U	pCi/L	2	9	22.2%	0.7	0.6	0.4	0.5	0.5	0.5	0.5	1.6	1.1	2.2
Without extremes	MW-3A	Gross Alpha minus Rn & U	pCi/L	1	8	12.5%	0.6	0.5	0.2	0.5	0.5	0.5	0.5	1.0	0.5	2.8
With extremes	MW-23	Iron	ug/L	2	11	18.2%	29.0	19.9	40.5	15.0	15.0	15.0	15.0	150.0	135.0	3.2
Without extremes	MW-23	Iron	ug/L	0	9	0.0%	15.0	15.0	0.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0
All	MW-25	Iron	ug/L	0	11	0.0%	15.0	15.0	0.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0
All	MW-27	Iron	ug/L	0	10	0.0%	15.0	15.0	0.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0
All	MW-31	Iron	ug/L	0	10	0.0%	15.0	15.0	0.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0
With extremes	MW-3A	Iron	ug/L	1	9	11.1%	91.0	23.0	228.0	15.0	15.0	15.0	15.0	699.0	684.0	3.0
Without extremes	MW-3A	Iron	ug/L	0	8	0.0%	15.0	15.0	0.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0
With extremes	MW-23	Lead	ug/L	2	11	18.2%	1.6	0.8	2.5	0.5	0.5	0.5	0.5	8.3	7.8	2.4
Without extremes	MW-23	Lead	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-24	Lead	ug/L	2	12	16.7%	2.1	0.7	5.2	0.5	0.5	0.5	0.5	18.6	18.1	3.4
Without extremes	MW-24	Lead	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Lead	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-27	Lead	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-28	Lead	ug/L	3	11	27.3%	0.8	0.7	0.6	0.5	0.5	1.5	0.5	2.0	1.5	1.3
All	MW-29	Lead	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-30	Lead	ug/L	1	10	10.0%	0.6	0.6	0.3	0.5	0.5	0.5	0.5	1.3	0.8	3.2
Without extremes	MW-30	Lead	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Lead	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-3A	Lead	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-27	Manganese	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-31	Manganese	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-23	Mercury	ug/L	0	11	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
With extremes	MW-24	Mercury	ug/L	2	12	16.7%	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.9	0.7	2.2
Without extremes	MW-24	Mercury	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-25	Mercury	ug/L	0	11	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-27	Mercury	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-28	Mercury	ug/L	0	11	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-29	Mercury	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-30	Mercury	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-31	Mercury	ug/L	0	10	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
All	MW-3A	Mercury	ug/L	0	9	0.0%	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0
With extremes	MW-23	Molybdenum	ug/L	1	11	9.1%	5.6	5.4	2.1	5.0	5.0	5.0	5.0	12.0	7.0	3.3
Without extremes	MW-23	Molybdenum	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
With extremes	MW-24	Molybdenum	ug/L	1	12	8.3%	6.4	5.7	4.9	5.0	5.0	5.0	5.0	22.0	17.0	3.5
Without extremes	MW-24	Molybdenum	ug/L	0	11	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-27	Molybdenum	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
With extremes	MW-28	Molybdenum	ug/L	0	11	0.0%	5.5	5.3	1.5	5.0	5.0	5.0	5.0	10.0	5.0	3.3
Without extremes	MW-28	Molybdenum	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
With extremes	MW-29	Molybdenum	ug/L	1	10	10.0%	5.8	5.5	2.5	5.0	5.0	5.0	5.0	13.0	8.0	3.2
Without extremes	MW-29	Molybdenum	ug/L	0	9	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0

Notes:

Type = All - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
Without Extremes - Extreme values have been removed from data set.
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2b
Descriptive Summary Statistics for Constituents in New Wells with Less than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-30	Molybdenum	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-31	Molybdenum	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-3A	Molybdenum	ug/L	0	9	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-23	Naphthalene	ug/L	0	13	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-24	Naphthalene	ug/L	0	12	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Naphthalene	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-27	Naphthalene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-28	Naphthalene	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-29	Naphthalene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-30	Naphthalene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Naphthalene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-3A	Naphthalene	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-23	Nickel	ug/L	4	11	36.4%	16.6	14.4	10.7	10.0	10.0	21.0	10.0	41.0	31.0	1.6
With extremes	MW-24	Nickel	ug/L	2	12	16.7%	15.7	12.7	14.2	10.0	10.0	10.0	10.0	56.0	46.0	2.6
Without extremes	MW-24	Nickel	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-25	Nickel	ug/L	0	11	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-27	Nickel	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
With extremes	MW-29	Nickel	ug/L	1	10	10.0%	11.2	10.8	3.8	10.0	10.0	10.0	10.0	22.0	12.0	3.2
Without extremes	MW-29	Nickel	ug/L	0	9	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-30	Nickel	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
All	MW-31	Nickel	ug/L	0	10	0.0%	10.0	10.0	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
With extremes	MW-24	Nitrate+Nitrite as N	mg/L	5	12	41.7%	0.3	0.1	0.4	0.1	0.1	0.3	0.1	1.3	1.2	2.2
Without extremes	MW-24	Nitrate+Nitrite as N	mg/L	4	11	36.4%	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.8	0.8	2.7
With extremes	MW-25	Nitrate+Nitrite as N	mg/L	1	12	8.3%	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.5	3.5
Without extremes	MW-25	Nitrate+Nitrite as N	mg/L	0	11	0.0%	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
With extremes	MW-29	Nitrate+Nitrite as N	mg/L	1	11	9.1%	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.8	0.8	3.3
Without extremes	MW-29	Nitrate+Nitrite as N	mg/L	0	10	0.0%	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
All	MW-24	Selenium	ug/L	3	12	25.0%	3.3	3.1	1.5	2.5	2.5	3.9	2.5	6.2	3.7	1.4
All	MW-25	Selenium	ug/L	0	11	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
With extremes	MW-29	Selenium	ug/L	2	10	20.0%	3.7	3.2	2.5	2.5	2.5	2.5	2.5	9.3	6.8	1.9
Without extremes	MW-29	Selenium	ug/L	0	8	0.0%	2.5	2.5	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0
All	MW-23	Silver	ug/L	0	11	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-24	Silver	ug/L	0	12	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-25	Silver	ug/L	0	11	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-27	Silver	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-28	Silver	ug/L	0	11	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-29	Silver	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-30	Silver	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-31	Silver	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-3A	Silver	ug/L	0	9	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-23	Toluene	ug/L	0	13	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-24	Toluene	ug/L	1	12	8.3%	0.7	0.6	0.5	0.5	0.5	0.5	0.5	2.3	1.8	3.5
Without extremes	MW-24	Toluene	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Toluene	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0

Notes:

Type = All - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
Without Extremes - Extreme values have been removed from data set.
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2b
Descriptive Summary Statistics for Constituents in New Wells with Less than 50% Detects

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-27	Toluene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-28	Toluene	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-29	Toluene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-30	Toluene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Toluene	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-3A	Toluene	ug/L	1	9	11.1%	5.7	0.8	15.5	0.5	0.5	0.5	0.5	47.0	46.5	3.0
Without extremes	MW-3A	Toluene	ug/L	0	8	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
With extremes	MW-23	Vanadium	ug/L	2	10	20.0%	14.7	10.3	19.1	7.5	7.5	7.5	7.5	68.0	60.5	3.0
Without extremes	MW-23	Vanadium	ug/L	0	8	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
With extremes	MW-24	Vanadium	ug/L	1	12	8.3%	13.4	9.1	20.4	7.5	7.5	7.5	7.5	78.0	70.5	3.5
Without extremes	MW-24	Vanadium	ug/L	0	11	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
All	MW-25	Vanadium	ug/L	0	11	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
All	MW-27	Vanadium	ug/L	0	10	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
All	MW-28	Vanadium	ug/L	0	11	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
All	MW-29	Vanadium	ug/L	0	10	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
All	MW-30	Vanadium	ug/L	0	10	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
With extremes	MW-31	Vanadium	ug/L	0	10	0.0%	7.8	7.7	0.8	7.5	7.5	7.5	7.5	10.0	2.5	3.2
Without extremes	MW-31	Vanadium	ug/L	0	9	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
With extremes	MW-3A	Vanadium	ug/L	1	9	11.1%	11.2	9.1	11.2	7.5	7.5	7.5	7.5	41.0	33.5	3.0
Without extremes	MW-3A	Vanadium	ug/L	0	8	0.0%	7.5	7.5	0.0	7.5	7.5	7.5	7.5	7.5	0.0	0.0
All	MW-23	Xylenes	ug/L	0	12	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-24	Xylenes	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-25	Xylenes	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-27	Xylenes	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-28	Xylenes	ug/L	0	11	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-29	Xylenes	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-30	Xylenes	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-31	Xylenes	ug/L	0	10	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
All	MW-3A	Xylenes	ug/L	0	9	0.0%	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0
Without extremes	MW-24	Zinc	ug/L	5	11	45.5%	9.7	8.1	6.8	5.0	5.0	11.0	5.0	24.0	19.0	1.4
With extremes	MW-25	Zinc	ug/L	2	11	18.2%	6.5	5.9	3.4	5.0	5.0	5.0	5.0	15.0	10.0	2.2
Without extremes	MW-25	Zinc	ug/L	1	10	10.0%	5.6	5.4	1.9	5.0	5.0	5.0	5.0	11.0	6.0	3.2
With extremes	MW-27	Zinc	ug/L	1	10	10.0%	6.4	5.7	4.4	5.0	5.0	5.0	5.0	19.0	14.0	3.2
Without extremes	MW-27	Zinc	ug/L	0	9	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
All	MW-30	Zinc	ug/L	0	10	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
With extremes	MW-31	Zinc	ug/L	2	10	20.0%	7.1	6.2	5.1	5.0	5.0	5.0	5.0	21.0	16.0	2.7
Without extremes	MW-31	Zinc	ug/L	0	8	0.0%	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0

Notes:

Type = All - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
Without Extremes - Extreme values have been removed from data set.
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Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 2b
Descriptive Summary Statistics for Constituents in New Wells with Less than 50% Detects

N Less Than 8																
Type	Well	Analyte	Units	Detects	N	% Detects	Mean	Geometric Mean	Std. Dev.	Q25	Median	Q75	Min. Conc.	Max. Conc.	Range	Skewness
All	MW-23	Tetrahydrofuran	ug/L	1	6	16.7%	1.4	0.8	2.2	0.5	0.5	0.5	0.5	6.0	5.5	2.4
All	MW-24	Tetrahydrofuran	ug/L	1	5	20.0%	1.9	0.9	3.1	0.5	0.5	0.5	0.5	7.4	6.9	2.2
All	MW-3A	Tetrahydrofuran	ug/L	2	5	40.0%	2.0	1.2	2.2	0.5	0.5	3.7	0.5	5.0	4.5	0.8
All	MW-23	Tin	ug/L	0	6	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-24	Tin	ug/L	0	7	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-25	Tin	ug/L	0	7	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-27	Tin	ug/L	0	6	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-28	Tin	ug/L	0	7	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-29	Tin	ug/L	0	6	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-30	Tin	ug/L	0	6	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-31	Tin	ug/L	0	6	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0
All	MW-3A	Tin	ug/L	0	6	0.0%	50.0	50.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0	0.0

Notes:

Type = All - Entire data set. Data set did not contain extremes.
With Extremes - Entire data set. Data set did contain extremes.
Without Extremes - Extreme values have been removed from data set.
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in Table 10.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in Table 10.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MaxConc = Maximum concentration
MinConc = Minimum concentration
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections

Table 3
Constituents Requiring Special Evaluation

Monitoring Well	Constituents that have a Statistically-significant Increasing Trend (decreasing for pH)[2]	Constituents That Have a Proposed GWCL in Excess of the Applicable GWQS[1]
MW-23	Sulfate	Uranium
MW-24		Manganese
		Uranium
MW-25	pH	Manganese
MW-27	pH	Uranium
MW-28	pH	Cadmium
		Manganese
MW-29		Manganese
MW-30	Nitrate+Nitrite as N	Nitrate+Nitrite as N
	Iron	
MW-31		Nitrate+Nitrite as N
		Selenium
MW-3A (far downgradient well)	pH	Cadmium
		Manganese
		Nickel
		Selenium
		Uranium

Notes

1 Taken from Table 10, extremes excluded.

2 Taken from Appendix D and includes all statistically-significant (p values less than 0.05) positively sloped regression lines, regardless of slope and magnitude of R2, provided that there is a sufficient number of data points to result in a statistically-significant determination and all statistically-significant Mann-Kendall upward trends (Z values greater than 1.85). In performing the regression and Mann-Kendall analyses, extremes were excluded.

Table 4
Geometric Mean and Standard Deviation of Normally or Log-Normally Distributed Data

Well	Constituent	GWQS	N	% Detected	Geomean	Geostd
MW-23	Ammonia	25	10	70.0%	0.11	3.35
MW-24	Ammonia	25	9	100.0%	2.79	1.99
MW-25	Ammonia	25	10	100.0%	0.61	1.14
MW-29	Ammonia	25	9	100.0%	0.98	1.14
MW-30	Ammonia	25	9	55.6%	0.05	1.88
MW-3A	Ammonia	25	9	77.8%	0.13	3.08
MW-24	Arsenic	50	12	58.3%	4.96	2.00
MW-28	Arsenic	50	10	100.0%	14.57	1.23
MW-25	Cadmium	5	10	100.0%	1.39	1.04
MW-28	Cadmium	5	11	100.0%	3.14	1.40
MW-3A	Cadmium	5	9	66.7%	1.16	3.66
MW-25	Chloride (mg/L)	TBD	11	100.0%	32.34	1.04
MW-27	Chloride (mg/L)	TBD	10	100.0%	34.67	1.05
MW-28	Chloride (mg/L)	TBD	11	100.0%	88.74	1.10
MW-29	Chloride (mg/L)	TBD	10	100.0%	38.27	1.04
MW-30	Chloride (mg/L)	TBD	9	100.0%	124.88	1.01
MW-31	Chloride (mg/L)	TBD	10	100.0%	132.81	1.04
MW-3A	Chloride (mg/L)	TBD	9	100.0%	61.32	1.07
MW-23	Chloromethane	30	12	50.0%	1.22	2.67
MW-28	Chloromethane	30	11	54.5%	1.20	2.47
MW-31	Chloromethane	30	9	55.6%	1.24	2.68
MW-3A	Chloromethane	30	8	75.0%	2.02	2.64
MW-28	Cobalt	730	11	100.0%	30.24	1.33
MW-24	Fluoride (mg/L)	4	11	100.0%	0.21	1.37
MW-25	Fluoride (mg/L)	4	11	100.0%	0.34	1.12
MW-27	Fluoride (mg/L)	4	10	100.0%	0.75	1.06
MW-28	Fluoride (mg/L)	4	11	100.0%	0.63	1.08
MW-29	Fluoride (mg/L)	4	10	100.0%	0.84	1.14
MW-30	Fluoride (mg/L)	4	10	100.0%	0.38	1.16
MW-3A	Fluoride (mg/L)	4	8	88.8%	1.26	1.15
MW-23	Gross Alpha minus Rn & U	15	10	80.0%	1.24	1.72
MW-27	Gross Alpha minus Rn & U	15	9	66.7%	0.89	1.57
MW-28	Gross Alpha minus Rn & U	15	10	80.0%	1.11	1.59
MW-29	Gross Alpha minus Rn & U	15	9	55.6%	0.94	1.91
MW-24	Iron	11,000	11	100.0%	517.29	5.07
MW-28	Iron	11,000	11	81.8%	63.73	2.70
MW-29	Iron	11,000	10	100.0%	1219.07	1.28
MW-30	Iron	11,000	10	90.0%	61.37	2.10
MW-23	Manganese	800	9	100.0%	279.30	1.55
MW-24	Manganese	800	12	100.0%	3125.14	1.65
MW-25	Manganese	800	11	100.0%	1696.46	1.03
MW-28	Manganese	800	11	100.0%	1520.68	1.11
MW-29	Manganese	800	9	100.0%	5020.29	1.06
MW-30	Manganese	800	10	90.0%	25.63	2.02
MW-3A	Manganese	800	9	100.0%	568.93	6.53
MW-3A	Nickel	100	9	55.6%	26.18	2.64
MW-27	Nitrate+Nitrite as N	10	10	100.0%	5.04	1.06
MW-30	Nitrate+Nitrite as N	10	10	100.0%	13.95	1.06
MW-31	Nitrate+Nitrite as N	10	10	100.0%	23.92	1.05
MW-3A	Nitrate+Nitrite as N	10	8	100.0%	0.99	1.18

Table 4

Geometric Mean and Standard Deviation of Normally or Log-Normally Distributed Data

Well	Constituent	GWQS	N	% Detected	Geomean	Geostd
MW-23	pH (s.u.)	6.5 to 8.5	10	100.0%	7.29	1.04
MW-24	pH (s.u.)	6.5 to 8.5	10	100.0%	7.21	1.03
MW-25	pH (s.u.)	6.5 to 8.5	10	100.0%	7.21	1.03
MW-27	pH (s.u.)	6.5 to 8.5	9	100.0%	7.65	1.02
MW-28	pH (s.u.)	6.5 to 8.5	11	100.0%	6.73	1.05
MW-29	pH (s.u.)	6.5 to 8.5	9	100.0%	6.97	1.04
MW-30	pH (s.u.)	6.5 to 8.5	9	100.0%	7.35	1.04
MW-31	pH (s.u.)	6.5 to 8.5	9	100.0%	7.48	1.05
MW-3A	pH (s.u.)	6.5 to 8.5	8	100.0%	7.23	1.03
MW-27	Selenium	50	10	100.0%	10.71	1.07
MW-28	Selenium	50	11	72.7%	4.96	1.59
MW-30	Selenium	50	10	100.0%	30.67	1.06
MW-31	Selenium	50	10	100.0%	62.51	1.07
MW-3A	Selenium	50	8	100.0%	71.25	1.14
MW-23	Sulfate (mg/L)	TBD	10	100.0%	2219.36	1.07
MW-24	Sulfate (mg/L)	TBD	11	100.0%	2590.29	1.06
MW-25	Sulfate (mg/L)	TBD	11	100.0%	1726.37	1.06
MW-27	Sulfate (mg/L)	TBD	10	100.0%	404.29	1.07
MW-28	Sulfate (mg/L)	TBD	10	100.0%	2359.59	1.04
MW-29	Sulfate (mg/L)	TBD	10	100.0%	2783.97	1.03
MW-30	Sulfate (mg/L)	TBD	10	100.0%	882.21	1.05
MW-3A	Sulfate (mg/L)	TBD	8	100.0%	3453.90	1.03
MW-24	TDS @ 180 C (mg/L)	TBD	10	100.0%	4112.90	1.04
MW-25	TDS @ 180 C (mg/L)	TBD	11	100.0%	2842.02	1.02
MW-27	TDS @ 180 C (mg/L)	TBD	10	100.0%	1019.05	1.03
MW-28	TDS @ 180 C (mg/L)	TBD	11	100.0%	3676.33	1.02
MW-30	TDS @ 180 C (mg/L)	TBD	10	100.0%	1743.12	1.05
MW-3A	TDS @ 180 C (mg/L)	TBD	9	100.0%	5546.46	1.02
MW-25	Thallium	2	11	100.0%	1.01	1.04
MW-28	Thallium	2	11	100.0%	0.86	1.08
MW-3A	Thallium	2	9	77.8%	0.61	1.71
MW-23	Uranium	30	10	100.0%	22.93	1.18
MW-24	Uranium	30	10	100.0%	4.84	2.91
MW-25	Uranium	30	11	100.0%	5.93	1.05
MW-27	Uranium	30	10	100.0%	31.38	1.04
MW-28	Uranium	30	11	100.0%	3.63	1.18
MW-30	Uranium	30	10	100.0%	7.01	1.10
MW-31	Uranium	30	10	100.0%	7.58	1.10
MW-3A	Uranium	30	8	100.0%	24.26	1.21
MW-23	Zinc	5,000	10	100.0%	32.76	1.69
MW-28	Zinc	5,000	11	100.0%	43.06	1.51
MW-29	Zinc	5,000	9	88.9%	13.69	1.62
MW-3A	Zinc	5,000	9	100.0%	60.90	1.89

Table 5
Results for all Detected Organic Compounds in the New Wells at White Mesa Mill

Well	Class	Date	CHEMICAL	RESULT	UNITS	QUAL	DETLIM	GWQS	GWCL	Exceed GWCL?
MW-24	III	6/23/2005	2-Butanone (MEK)	22	ug/L		20	4000	2000	NO
MW-24	**III**	**6/23/2005**	**Acetone**	**700**	**ug/L**		**20**	**700**	**350**	**YES**
MW-24	**III**	**7/26/2005**	**Acetone**	**550**	**ug/L**		**20**	**700**	**350**	**YES**
MW-24	III	9/25/2005	Acetone	33	ug/L		20	700	350	NO
MW-27	II	6/22/2006	Chloroform	5.6	ug/L		1	70	17.5	NO
MW-28	**III**	**7/26/2005**	**Chloroform**	**260**	**ug/L**	**D**	**50**	**70**	**35**	**YES**
MW-3A	III	6/23/2005	Chloroform	4.4	ug/L		1	70	35	NO
MW-3A	III	9/25/2005	Chloroform	2.6	ug/L		1	71	35	NO
MW-23	III	9/25/2005	Chloromethane	3.9	ug/L		1	30	15	NO
MW-23	III	12/14/2005	Chloromethane	2	ug/L		1	30	15	NO
MW-23	III	3/22/2006	Chloromethane	6.2	ug/L		1	30	15	NO
MW-23	III	6/20/2006	Chloromethane	1.8	ug/L		1	30	15	NO
MW-24	III	7/26/2005	Chloromethane	3	ug/L		1	30	15	NO
MW-24	III	9/25/2005	Chloromethane	5.6	ug/L		1	30	15	NO
MW-24	III	3/27/2006	Chloromethane	7.2	ug/L		1	30	15	NO
MW-25	II	9/22/2005	Chloromethane	3.5	ug/L		1	30	7.5	NO
MW-25	II	3/22/2006	Chloromethane	5.8	ug/L		1	30	7.5	NO
MW-27	II	9/22/2005	Chloromethane	3.1	ug/L		1	30	7.5	NO
MW-27	II	3/21/2006	Chloromethane	4.4	ug/L		1	30	7.5	NO
MW-28	III	6/21/2005	Chloromethane	2.8	ug/L		1	30	15	NO
MW-28	III	9/22/2005	Chloromethane	4	ug/L		1	30	15	NO
MW-28	III	12/14/2005	Chloromethane	1	ug/L		1	30	15	NO
MW-28	III	6/23/2006	Chloromethane	2.9	ug/L		1	30	15	NO
MW-29	III	9/22/2005	Chloromethane	4.2	ug/L		1	30	15	NO
MW-29	III	3/21/2006	Chloromethane	5.5	ug/L		1	30	15	NO
MW-30	II	9/22/2005	Chloromethane	2.5	ug/L		1	30	7.5	NO
MW-30	II	3/22/2006	Chloromethane	3.1	ug/L		1	30	7.5	NO
MW-31	II	9/22/2005	Chloromethane	5.9	ug/L		1	30	7.5	NO
MW-31	II	12/14/2005	Chloromethane	1.3	ug/L		1	30	7.5	NO
MW-31	II	3/22/2006	Chloromethane	4.6	ug/L		1	30	7.5	NO
MW-3A	III	9/25/2005	Chloromethane	5.8	ug/L		1	30	15	NO
MW-3A	III	12/14/2005	Chloromethane	1.4	ug/L		1	30	15	NO
MW-3A	III	3/27/2006	Chloromethane	5.6	ug/L		1	30	15	NO
MW-3A	III	6/25/2006	Chloromethane	2.6	ug/L		1	30	15	NO
MW-3A	III	9/19/2006	Chloromethane	3.2	ug/L		1	30	15	NO
MW-3A	III	10/26/2006	Chloromethane	2.9	ug/L		1	30	15	NO
MW-23	III	9/18/2006	Chloromethane	3.4	ug/L		1	30	15	NO
MW-23	III	10/24/2006	Chloromethane	2.3	ug/L		1	30	15	NO
MW-24	III	9/15/2006	Chloromethane	8.6	ug/L		1	30	15	NO
MW-24	III	10/24/2006	Chloromethane	3.3	ug/L		1	30	15	NO
MW-25	II	9/12/2006	Chloromethane	2.2	ug/L		1	30	7.5	NO
MW-25	II	10/24/2006	Chloromethane	1.6	ug/L		1	30	7.5	NO
MW-27	II	9/12/2006	Chloromethane	2.7	ug/L		1	30	7.5	NO
MW-27	II	10/24/2006	Chloromethane	1.7	ug/L		1	30	7.5	NO
MW-28	III	9/12/2006	Chloromethane	3	ug/L		1	30	15	NO
MW-28	III	10/24/2006	Chloromethane	2.5	ug/L		1	30	15	NO
MW-29	III	9/12/2006	Chloromethane	8.2	ug/L		1	30	15	NO
MW-29	III	10/24/2006	Chloromethane	2.6	ug/L		1	30	15	NO
MW-30	II	9/13/2006	Chloromethane	1.2	ug/L		1	30	7.5	NO
MW-30	II	10/25/2006	Chloromethane	2.2	ug/L		1	30	7.5	NO
MW-31	II	9/13/2006	Chloromethane	2.1	ug/L		1	30	7.5	NO
MW-31	II	10/25/2006	Chloromethane	1.5	ug/L		1	30	7.5	NO
MW-23	III	12/14/2005	Tetrahydrofuran	6	ug/L		1	46	23	NO
MW-24	III	12/14/2005	Tetrahydrofuran	7.4	ug/L		1	46	23	NO
MW-3A	III	12/14/2005	Tetrahydrofuran	5	ug/L		1	46	23	NO
MW-3A	III	6/25/2006	Tetrahydrofuran	3.7	ug/L		1	46	23	NO
MW-24	III	3/27/2006	Toluene	2.3	ug/L		1	1000	500	NO
MW-3A	III	3/27/2006	Toluene	47	ug/L		1	1000	500	NO

Notes:

Well = Monitoring well name
CLASS = Class designation based on water quality; Class II waters have TDS less than 3,000 mg/L; Class III waters have TDS between 3,000 and 10,000 mg/L
SDATE = Sampling date
LAB = Laboratory that performed the chemical analysis
QUAL = Result qualifier, where "D" indicates dilution for analysis
DETLIM = Detection limit
GWQS = Groundwater Quality Standard
GWCL = Groundwater Compliance Limit, based on classification of groundwater (CLASS)
µg/L = Micrograms per liter
mg/L = Milligrams per liter
ppm = parts per million
EXCEEDS GWCL? = Boldface font highlights exceedances; NA means Not Applicable

Table 6
Laboratory Analytical Methods

Sample Analysis	Method
Nitrogen, Ammonia as N	A4500-NH3 G
Iron	E200.7
Chloride	A4500-Cl B
Fluoride	A4500-F C
Gross Alpha	E900.1
Metals, other than Iron and Tin	E200.8
Nitrogen, Nitrate + Nitrite	E353.2
pH	A4500-H B
Sulfate	A4500-SO4 E
TDS	A2540 C
Tin	200.7.8-W-D
Uranium	E200.8
VOCs	SW8260B

Table 7
Comparison for Calculated and Measured TDS for Samples with Complete Major Ion Analysis

Well	Date	Alkalinity	Ca	Cl	K	Mg	Na	SO4	Measured TDS	Calculated TDS	Ratio
MW-23	6/22/2006	225	441	7	12.9	151	403	2280	3440	3520	102.3%
MW-24	6/22/2006	513	454	30	15.6	173	478	2580	3980	4244	106.6%
MW-25	9/12/2006	326	385	30	10.8	135	287	1570	2800	2744	98.0%
MW-28	6/21/2005	127	452	80	11.6	148	302	2010	3720	3131	**84.2%**
MW-28	6/23/2006	142	491	91	11.9	167	276	2190	3540	3369	95.2%
MW-29	6/22/2005	244	468	40	16.3	222	442	2700	4390	4132	94.1%
MW-30	6/22/2005	176	302	125	8.9	83.7	113	977	1940	1786	92.0%
MW-31	6/22/2005	169	156	139	5.6	78.6	90.3	504	1290	1143	88.6%
MW-3A	6/25/2006	307	443	61	30.2	282	679	3510	5700	5312	93.2%

Well	Date	CO3+HCO3 as Alkalinity	Ca	Cl	K	Mg	Na	SO4	Measured TDS	Calculated TDS	Ratio
MW-23	6/24/2005	308	339	3	16.4	119	376	1950	3100	3111	100.4%
MW-23	9/25/2005	373	430	10	12.7	150	378	2150	3520	3504	99.5%
MW-23	12/14/2005	93	176	1	5.2	60.5	157	875	1440	1368	95.0%
MW-23	3/22/2006	330	448	8	11.5	152	379	2240	3470	3569	102.8%
MW-23	6/20/2006	410	378	32	10.2	138	284	1680	2850	2932	102.9%
MW-23	9/18/2006	307	454	6	11.7	152	384	2090	3520	3405	96.7%
MW-23	10/24/2006	505	481	6	11.4	163	368	2100	2920	3634	**124.5%**
MW-23	3/14/2007	299	454	9	11.2	154	377	2340	3640	3644	100.1%
MW-23	6/20/2007	282	475	6	11.9	164	378	2320	3630	3637	100.2%
MW-24	6/23/2005	629	634	71	23.2	186	449	2450	4200	4442	105.8%
MW-24	9/25/2005	422	513	52	50.5	190	454	2850	4340	4532	104.4%
MW-24	12/14/2005	254	512	45	13.6	194	454	2680	4170	4153	99.6%
MW-24	3/27/2006	452	353	47	10	135	309	2470	2910	3776	**129.8%**
MW-24	9/15/2006	437	492	62	14.5	176	461	2290	3890	3933	101.1%
MW-24	10/24/2006	400	489	46	14.3	176	458	2680	3820	4263	111.6%
MW-24	3/16/2007	388	478	45	13.6	178	425	2520	4140	4048	97.8%
MW-24	6/20/2007	296	496	44	14.8	181	454	2680	4160	4166	100.1%
MW-25	6/23/2005	393	358	34	9.1	128	282	1600	2860	2804	98.0%
MW-25	9/22/2005	404	376	34	9.6	135	285	1670	2890	2914	100.8%
MW-25	12/13/2005	397	386	33	10	139	290	1860	2850	3115	109.3%
MW-25	3/22/2006	407	347	32	9.7	122	291	1710	2850	2919	102.4%
MW-25	6/20/2006	410	378	32	10.2	138	284	1680	2850	2932	102.9%
MW-25	10/24/2006	406	400	33	10	138	295	1880	2740	3162	**115.4%**
MW-25	3/16/2007	391	386	32	10.1	135	289	1750	2970	2993	100.8%
MW-25	6/20/2007	404	395	31	9.9	140	269	1740	2900	2989	103.1%
MW-27	6/23/2005	420	151	34	3.9	66.4	72.7	402	1050	1150	109.5%
MW-27	9/22/2005	431	156	35	4	69.3	73.2	403	1010	1172	**116.0%**
MW-27	12/14/2005	440	161	33	4.2	70.8	75.2	398	1020	1182	**115.9%**
MW-27	3/21/2006	440	152	34	3.9	67.6	71.8	362	1010	1131	112.0%
MW-27	6/22/2006	437	147	32	5	66.3	79.5	360	954	1127	**118.1%**
MW-27	9/12/2006	424	168	34	4.4	72.3	77.6	417	1020	1197	**117.4%**
MW-27	10/24/2006	447	174	37	4.4	74.6	80.2	432	1030	1249	**121.3%**
MW-27	3/14/2007	430	168	36	4.5	73.3	78.9	420	1050	1211	**115.3%**
MW-28	9/22/2005	153	514	96	10.6	166	286	2310	3590	3536	98.5%
MW-28	12/14/2005	166	532	86	12.5	203	303	2380	3770	3683	97.7%
MW-28	3/22/2006	153	522	83	11.8	185	298	2320	3640	3573	98.2%
MW-28	9/12/2006	96	521	73	12.2	190	299	2380	3720	3571	96.0%
MW-28	10/24/2006	157	518	86	12.1	184	294	2520	3600	3771	104.8%
MW-28	3/15/2007	140	519	97	14.3	192	332	2340	3800	3634	95.6%
MW-28	6/20/2007	152	521	94	12.4	188	291	2360	3770	3618	96.0%
MW-29	9/22/2005	315	479	39	16.4	230	442	2840	4400	4361	99.1%
MW-29	12/14/2005	318	508	36	17.1	238	449	2770	4400	4336	98.5%
MW-29	3/21/2006	337	496	41	16.6	236	432	2710	4380	4269	97.5%
MW-29	6/21/2006	318	463	38	17.3	227	433	2770	4320	4266	98.8%
MW-29	9/12/2006	313	492	37	17.1	230	438	2720	4250	4247	99.9%
MW-29	10/24/2006	337	502	39	17.2	234	456	2980	4380	4565	104.2%
MW-29	3/15/2007	324	505	39	17.3	236	433	2780	4520	4334	95.9%
MW-30	9/22/2005	208	304	125	8.7	84.8	103	822	1780	1656	93.0%
MW-30	12/14/2005	196	316	128	8.5	84.5	102	904	1800	1739	96.6%
MW-30	3/22/2006	196	312	125	8.3	82.4	111	911	1740	1746	100.3%
MW-30	6/21/2006	202	324	124	179	76.5	106	876	1700	1888	111.0%
MW-30	9/13/2006	210	307	118	8.5	76	110	910	1790	1740	97.2%
MW-30	10/25/2006	204	301	124	8.5	78.6	114	871	1650	1701	103.1%

Table 7
Comparison for Calculated and Measured TDS for Samples with Complete Major Ion Analysis

Well	Date	CO3+HCO3 as Alkalinity	Ca	Cl	K	Mg	Na	SO4	Measured TDS	Calculated TDS	Ratio
MW-30	3/15/2007	191	288	125	8.2	73.7	102	838	1690	1626	96.2%
MW-31	9/22/2005	205	166	136	5.8	82.3	93.2	436	1280	1124	87.8%
MW-31	12/14/2005	199	179	135	6	86.6	96.1	509	1290	1211	93.9%
MW-31	3/22/2006	208	174	133	6.1	87.9	88.4	485	1280	1182	92.4%
MW-31	6/21/2006	208	186	138	6.5	87.3	97.6	522	1300	1245	95.8%
MW-31	9/13/2006	212	175	131	6.1	82.5	96.1	516	1320	1219	92.3%
MW-31	10/25/2006	205	175	127	6.1	85.3	98.7	526	1220	1223	100.3%
MW-31	3/15/2007	211	171	132	6.6	86.1	94.6	516	1280	1217	95.1%
MW-3A	6/23/2005	171	441	63	26.4	284	698	3380	5540	5063	91.4%
MW-3A	9/25/2005	343	471	64	26.6	298	715	3560	5560	5478	98.5%
MW-3A	12/14/2005	303	482	60	26.6	314	707	3520	5360	5413	101.0%
MW-3A	3/27/2006	324	480	56	26.7	318	706	3490	5410	5401	99.8%
MW-3A	9/19/2006	357	467	70	27.7	293	722	3440	5580	5377	96.4%
MW-3A	10/26/2006	410	460	57	26.8	288	737	3270	5520	5249	95.1%
MW-3A	3/14/2007	382	478	62	26.9	309	754	3810	5770	5822	100.9%

Table 8
Charge Balance of Major Cations and Anions

Well	Date	Ca	Na	Mg	K	Total Cation Charge	HCO3	Cl	SO4	Total Anion Charge	Percent Difference
MW-23	6/24/2005	16.92	16.35	9.79	0.42	**43.48**	-5.03	-0.08	-40.60	**-45.71**	-5.13%
MW-23	9/25/2005	21.46	16.44	12.34	0.32	**50.57**	-6.10	-0.28	-44.76	**-51.14**	-1.13%
MW-23	12/14/2005	8.78	6.83	4.98	0.13	**20.72**	-1.51	-0.03	-18.22	**-19.75**	4.68%
MW-23	3/22/2006	22.36	16.49	12.51	0.29	**51.64**	-5.39	-0.23	-46.64	**-52.25**	-1.18%
MW-23	6/20/2006	18.86	12.35	11.36	0.26	**42.83**	-6.70	-0.90	-34.98	**-42.58**	0.58%
MW-23	6/22/2006	22.01	17.53	12.43	0.33	**52.29**	-4.49	-0.20	-47.47	**-52.16**	0.26%
MW-23	9/18/2006	22.66	16.70	12.51	0.30	**52.17**	-5.01	-0.17	-43.51	**-48.70**	6.65%
MW-23	10/24/2006	24.00	16.01	13.41	0.29	**53.71**	-8.26	-0.17	-43.72	**-52.15**	2.91%
MW-23	3/14/2007	22.66	16.40	12.67	0.29	**52.01**	-4.88	-0.25	-48.72	**-53.86**	-3.54%
MW-23	6/20/2007	23.70	16.44	13.50	0.30	**53.95**	-4.61	-0.17	-48.30	**-53.08**	1.61%
MW-23	8/27/2007	23.55	15.01	13.25	0.27	**52.08**	-4.10	-0.23	-51.22	**-55.54**	-6.64%
MW-23	10/23/2007	23.70	14.92	13.50	0.28	**52.40**	-2.65	-0.20	-48.09	**-50.95**	2.78%
MW-24	6/23/2005	31.64	19.53	15.31	0.59	**67.07**	-10.29	-2.00	-51.01	**-63.30**	5.61%
MW-24	9/25/2005	25.60	19.75	15.63	1.29	**62.27**	-6.90	-1.47	-59.34	**-67.70**	-8.72%
MW-24	12/14/2005	25.55	19.75	15.96	0.35	**61.61**	-4.15	-1.27	-55.80	**-61.21**	0.65%
MW-24	3/27/2006	17.62	13.44	11.11	0.26	**42.42**	-7.39	-1.33	-51.42	**-60.14**	**-41.77%**
MW-24	6/22/2006	22.66	20.79	14.24	0.40	**58.08**	-10.26	-0.85	-53.71	**-64.82**	**-11.60%**
MW-24	9/15/2006	24.55	20.05	14.48	0.37	**59.46**	-7.15	-1.75	-47.68	**-56.57**	4.86%
MW-24	10/24/2006	24.40	19.92	14.48	0.37	**59.17**	-6.54	-1.30	-55.80	**-63.63**	-7.54%
MW-24	3/16/2007	23.85	18.49	14.65	0.35	**57.33**	-6.34	-1.27	-52.47	**-60.08**	-4.78%
MW-24	6/20/2007	24.75	19.75	14.89	0.38	**59.77**	-4.83	-1.24	-55.80	**-61.87**	-3.51%
MW-24	8/28/2007	25.15	18.57	15.39	0.32	**59.43**	-5.10	-1.27	-56.63	**-63.00**	-5.99%
MW-24	10/23/2007	25.40	21.53	15.06	0.37	**62.36**	-4.92	-1.27	-54.55	**-60.73**	2.61%
MW-25	6/23/2005	17.87	12.27	10.53	0.23	**40.90**	-6.42	-0.96	-33.31	**-40.69**	0.49%
MW-25	9/22/2005	18.76	12.40	11.11	0.25	**42.51**	-6.60	-0.96	-34.77	**-42.33**	0.43%
MW-25	12/13/2005	19.26	12.61	11.44	0.26	**43.57**	-6.49	-0.93	-38.72	**-46.15**	-5.91%
MW-25	3/22/2006	17.32	12.66	10.04	0.25	**40.26**	-6.65	-0.90	-35.60	**-43.16**	-7.20%
MW-25	6/20/2006	18.86	12.35	11.36	0.26	**42.83**	-6.70	-0.90	-34.98	**-42.58**	0.58%
MW-25	9/12/2006	19.21	12.48	11.11	0.28	**43.08**	-6.52	-0.85	-32.69	**-40.06**	7.02%
MW-25	10/24/2006	19.96	12.83	11.36	0.26	**44.40**	-6.64	-0.93	-39.14	**-46.71**	-5.19%
MW-25	3/16/2007	19.26	12.57	11.11	0.26	**43.20**	-6.39	-0.90	-36.43	**-43.73**	-1.22%
MW-25	6/20/2007	19.71	11.70	11.52	0.25	**43.19**	-6.60	0.00	-36.23	**-42.83**	0.82%
MW-25	8/27/2007	19.46	11.92	11.19	0.24	**42.81**	-6.75	-0.93	-38.52	**-46.20**	-7.90%
MW-25	10/25/2007	19.56	11.83	9.46	0.26	**41.11**	-6.72	-0.90	-35.60	**-43.22**	-5.13%
MW-27	6/23/2005	7.54	3.16	5.46	0.10	**16.26**	-6.87	-0.96	-8.37	**-16.20**	0.40%
MW-27	9/22/2005	7.78	3.18	5.70	0.10	**16.77**	-7.05	-0.99	-8.39	**-16.42**	2.08%
MW-27	12/14/2005	8.03	3.27	5.83	0.11	**17.24**	-7.19	-0.93	-8.29	**-16.41**	4.80%
MW-27	3/21/2006	7.59	3.12	5.56	0.10	**16.37**	-7.19	-0.96	-7.54	**-15.69**	4.16%
MW-27	6/22/2006	7.34	3.46	5.46	0.13	**16.38**	-7.15	-0.90	-7.50	**-15.54**	5.09%
MW-27	9/12/2006	8.38	3.38	5.95	0.11	**17.82**	-6.93	-0.96	-8.68	**-16.57**	7.00%
MW-27	10/24/2006	8.68	3.49	6.14	0.11	**18.42**	-7.31	-1.04	-8.99	**-17.35**	5.84%
MW-27	3/14/2007	8.38	3.43	6.03	0.12	**17.96**	-7.03	-1.02	-8.74	**-16.79**	6.52%
MW-27	8/28/2007	8.78	3.24	6.25	0.11	**18.39**	-7.37	-0.99	-9.41	**-17.77**	3.35%
MW-27	10/22/2007	8.48	3.22	6.02	0.11	**17.84**	-7.34	-1.04	-8.45	**-16.84**	5.61%
MW-28	6/21/2005	22.56	13.14	12.18	0.30	**48.17**	-2.54	-2.26	-41.85	**-46.64**	3.16%
MW-28	9/22/2005	25.65	12.44	13.66	0.27	**52.02**	-2.49	-2.71	-48.09	**-53.29**	-2.44%
MW-28	12/14/2005	26.55	13.18	16.70	0.32	**56.75**	-2.70	-2.43	-49.55	**-54.68**	3.65%
MW-28	3/22/2006	26.05	12.96	15.22	0.30	**54.54**	-2.49	-2.34	-48.30	**-53.13**	2.57%
MW-28	6/23/2006	24.50	12.01	13.74	0.30	**50.55**	-2.85	-2.57	-45.59	**-51.01**	-0.91%
MW-28	9/12/2006	26.00	13.01	15.63	0.31	**54.95**	-1.56	-2.06	-49.55	**-53.17**	3.25%
MW-28	10/24/2006	25.85	12.79	15.14	0.31	**54.09**	-2.56	-2.43	-52.47	**-57.45**	-6.21%
MW-28	3/15/2007	25.90	14.44	15.80	0.37	**56.51**	-2.28	-2.74	-48.72	**-53.73**	4.91%
MW-28	6/20/2007	26.00	12.66	15.47	0.32	**54.44**	-2.47	-2.65	-49.13	**-54.26**	0.34%
MW-28	8/28/2007	26.45	11.57	14.81	0.28	**53.11**	-2.64	-2.68	-50.80	**-56.12**	-5.65%
MW-28	10/23/2007	26.85	12.27	15.14	0.29	**54.55**	-2.65	-2.79	-49.34	**-54.79**	-0.45%

Table 8
Charge Balance of Major Cations and Anions

Well	Date	Ca	Na	Mg	K	Total Cation Charge	HCO3	Cl	SO4	Total Anion Charge	Percent Difference
MW-29	6/22/2005	23.35	19.23	18.27	0.42	**61.26**	-4.87	-1.13	-56.21	**-62.21**	-1.54%
MW-29	9/22/2005	23.90	19.23	18.93	0.42	**62.47**	-5.15	-1.10	-59.13	**-65.37**	-4.64%
MW-29	12/14/2005	25.35	19.53	19.58	0.44	**64.90**	-5.20	-1.02	-57.67	**-63.88**	1.57%
MW-29	3/21/2006	24.75	18.79	19.42	0.42	**63.39**	-5.51	-1.16	-56.42	**-63.08**	0.48%
MW-29	6/21/2006	23.10	18.83	18.68	0.44	**61.06**	-5.20	-1.07	-57.67	**-63.94**	-4.71%
MW-29	9/12/2006	24.55	19.05	18.93	0.44	**62.97**	-5.11	-1.04	-56.63	**-62.79**	0.29%
MW-29	10/24/2006	25.05	19.83	19.26	0.44	**64.58**	-5.51	-1.10	-62.04	**-68.65**	-6.30%
MW-29	3/15/2007	25.20	18.83	19.42	0.44	**63.90**	-5.29	-1.10	-57.88	**-64.27**	-0.59%
MW-29	8/22/2007	24.60	19.14	19.26	0.42	**63.42**	-5.57	-1.04	-58.09	**-64.70**	-2.03%
MW-29	10/24/2007	25.45	18.49	19.75	0.44	**64.13**	-5.54	-1.04	-58.09	**-64.67**	-0.84%
MW-30	6/22/2005	15.07	4.92	6.89	0.23	**27.10**	-3.52	-3.53	-20.34	**-27.39**	-1.07%
MW-30	9/22/2005	15.17	4.48	6.98	0.22	**26.85**	-3.39	-3.53	-17.11	**-24.03**	**10.50%**
MW-30	12/14/2005	15.77	4.44	6.95	0.22	**27.38**	-3.20	-3.61	-18.82	**-25.63**	6.39%
MW-30	3/22/2006	15.57	4.83	6.78	0.21	**27.39**	-3.20	-3.53	-18.97	**-25.69**	6.22%
MW-30	6/21/2006	16.17	4.61	6.30	4.58	**31.65**	-3.29	-3.50	-18.24	**-25.03**	**20.92%**
MW-30	9/13/2006	15.32	4.78	6.25	0.22	**26.58**	-3.43	-3.33	-18.95	**-25.70**	3.30%
MW-30	10/25/2006	15.02	4.96	6.47	0.22	**26.66**	-3.33	-3.50	-18.13	**-24.96**	6.40%
MW-30	3/15/2007	14.37	4.44	6.06	0.21	**25.08**	-3.11	-3.53	-17.45	**-24.09**	3.97%
MW-30	8/22/2007	14.27	4.70	5.95	0.19	**25.11**	-3.16	-3.55	-17.74	**-24.46**	2.59%
MW-30	10/24/2007	14.67	4.78	6.00	0.21	**25.66**	-3.23	-3.44	-18.13	**-24.80**	3.35%
MW-31	6/22/2005	7.78	3.93	6.47	0.14	**18.32**	-5.57	-3.92	-10.49	**-19.99**	-9.07%
MW-31	9/22/2005	8.28	4.05	6.77	0.15	**19.26**	-5.54	-3.84	-9.08	**-18.45**	4.18%
MW-31	12/14/2005	8.93	4.18	7.13	0.15	**20.39**	-4.56	-3.81	-10.60	**-18.96**	7.02%
MW-31	3/22/2006	8.68	3.85	7.23	0.16	**19.92**	-5.83	-3.75	-10.10	**-19.68**	1.17%
MW-31	6/21/2006	9.28	4.25	7.18	0.17	**20.88**	-6.80	-3.89	-10.87	**-21.56**	-3.28%
MW-31	9/13/2006	8.73	4.18	6.79	0.16	**19.86**	-7.39	-3.70	-10.74	**-21.83**	-9.93%
MW-31	10/25/2006	8.73	4.29	7.02	0.16	**20.20**	-7.39	-3.58	-10.95	**-21.92**	-8.53%
MW-31	3/15/2007	8.53	4.11	7.08	0.17	**19.90**	-7.60	-3.72	-10.74	**-22.07**	**-10.90%**
MW-31	8/27/2007	8.88	4.05	7.06	0.16	**20.15**	-6.10	-3.84	-11.08	**-21.01**	-4.25%
MW-31	10/24/2007	8.58	4.06	6.90	0.16	**19.70**	-7.39	-3.44	-10.35	**-21.18**	-7.51%
MW-3A	6/23/2005	22.01	30.36	23.37	0.68	**76.41**	-2.79	-1.78	-70.37	**-74.93**	1.94%
MW-3A	9/25/2005	23.50	31.10	24.52	0.68	**79.81**	-5.60	-1.81	-74.12	**-81.53**	-2.16%
MW-3A	12/14/2005	24.05	30.75	25.84	0.68	**81.32**	-4.95	-1.69	-73.28	**-79.93**	1.72%
MW-3A	3/27/2006	23.95	30.71	26.17	0.68	**81.51**	-5.29	-1.58	-72.66	**-79.53**	2.43%
MW-3A	6/25/2006	22.11	29.53	23.21	0.77	**75.62**	-6.15	-1.72	-73.08	**-80.94**	-7.04%
MW-3A	9/19/2006	23.30	31.40	24.11	0.71	**79.53**	-5.83	-1.97	-71.62	**-79.43**	0.13%
MW-3A	10/26/2006	22.96	32.06	23.70	0.69	**79.40**	-6.70	-1.61	-68.08	**-76.39**	3.79%
MW-3A	3/14/2007	23.85	32.80	25.43	0.69	**82.77**	-6.24	-1.75	-79.32	**-87.32**	-5.50%
MW-3A	10/31/2007	23.90	32.23	25.51	0.75	**82.39**	-5.31	-1.69	-72.24	**-79.25**	3.82%

Table 9
Relative Percent Difference Between Primary and Duplicate Samples

Well	Chemical	Sample Date	Result	QUAL	Duplicate Result	Duplicate Qualifier	DETLIM	Units	RPD
MW-27	2-Butanone (MEK)	3/21/2006	20	U	20	U	20	ug/L	0.00%
MW-31	2-Butanone (MEK)	3/15/2007	20	U	20	U	20	ug/L	0.00%
MW-27	Acetone	3/21/2006	20	U	20	U	20	ug/L	0.00%
MW-31	Acetone	3/15/2007	20	U	20	U	20	ug/L	0.00%
MW-27	Arsenic	3/21/2006	5	U	5	U	5	ug/L	0.00%
MW-31	Arsenic	3/15/2007	5	U	5	U	5	ug/L	0.00%
MW-27	Benzene	3/21/2006	1	U	1	U	1	ug/L	0.00%
MW-31	Benzene	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Beryllium	3/21/2006	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-31	Beryllium	3/15/2007	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-27	Cadmium	3/21/2006	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-31	Cadmium	3/15/2007	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-27	Carbon tetrachloride	3/21/2006	1	U	1	U	1	ug/L	0.00%
MW-31	Carbon tetrachloride	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Chloride	3/21/2006	34		36		1	ug/L	-5.56%
MW-31	Chloride	3/15/2007	132		132		1	mg/L	0.00%
MW-27	Chloroform	3/21/2006	1	U	1	U	1	mg/L	0.00%
MW-31	Chloroform	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Chloromethane	3/21/2006	4.4		6.3		1	ug/L	-30.16%
MW-31	Chloromethane	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Chromium	3/21/2006	25	U	25	U	25	ug/L	0.00%
MW-31	Chromium	3/15/2007	25	U	25	U	25	ug/L	0.00%
MW-27	Cobalt	3/21/2006	10	U	10	U	10	ug/L	0.00%
MW-31	Cobalt	3/15/2007	10	U	10	U	10	ug/L	0.00%
MW-27	Copper	3/21/2006	10	U	10	U	10	ug/L	0.00%
MW-31	Copper	3/15/2007	10	U	10	U	10	ug/L	0.00%
MW-27	Dichloromethane	3/21/2006	1	U	1	U	1	ug/L	0.00%
MW-31	Dichloromethane	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Fluoride	3/21/2006	0.8		0.8		0.1	ug/L	0.00%
MW-31	Fluoride	3/15/2007	0.9		1		0.1	mg/L	-10.00%
MW-27	Gross Alpha minus Rn & U	3/21/2006	1.1		1	U	1	mg/L	10.00%
MW-31	Gross Alpha minus Rn & U	3/15/2007	1	U	1	U	1	pCi/L	0.00%
MW-27	Iron	3/21/2006	30	U	30	U	30	pCi/L	0.00%
MW-31	Iron	3/15/2007	30	U	30	U	30	ug/L	0.00%
MW-27	Lead	3/21/2006	1	U	1	I	1	ug/L	0.00%
MW-31	Lead	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Manganese	3/21/2006	10	U	10	U	10	ug/L	0.00%
MW-31	Manganese	3/15/2007	10	U	10	U	10	ug/L	0.00%
MW-27	Mercury	3/21/2006	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-31	Mercury	3/15/2007	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-27	Molybdenum	3/21/2006	10	U	10	U	10	ug/L	0.00%
MW-31	Molybdenum	3/15/2007	10	U	10	U	10	ug/L	0.00%
MW-27	Naphthalene	3/21/2006	1	U	1	U	1	ug/L	0.00%
MW-31	Naphthalene	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Nickel	3/21/2006	20	U	20	U	20	ug/L	0.00%
MW-31	Nickel	3/15/2007	20	U	20	U	20	ug/L	0.00%
MW-27	Nitrogen, Ammonia as N	3/21/2006	0.08		0.09		0.05	ug/L	-11.11%
MW-31	Nitrogen, Ammonia as N	3/15/2007	0.05	U	0.05	U	0.05	mg/L	0.00%
MW-27	Nitrogen, Nitrate+Nitrite as N	3/21/2006	5.1	D	5.5	D	0.2	mg/L	-7.27%
MW-31	Nitrogen, Nitrate+Nitrite as N	3/15/2007	22	D	23.2	D	0.8	mg/L	-5.17%
MW-27	PH	3/21/2006	7.86		8.06		0.01	mg/L	-2.48%
MW-31	pH	3/15/2007	6.79		6.77		0.01	SU	0.30%
MW-27	Selenium	3/21/2006	10.2		9.4		5	s.u.	8.51%
MW-31	Selenium	3/15/2007	59.2		60.3		5	ug/L	-1.82%
MW-27	Silver	3/21/2006	10	U	10	U	10	ug/L	0.00%
MW-31	Silver	3/15/2007	10	U	10	U	10	ug/L	0.00%
MW-27	Sulfate	3/21/2006	362		362		1	ug/L	0.00%
MW-31	Sulfate	3/15/2007	516	D	514	D	10	mg/L	0.39%
MW-27	TDS @ 180 C	3/21/2006	1010	U	1010		10	mg/L	0.00%

Table 9
Relative Percent Difference Between Primary and Duplicate Samples

Well	Chemical	Sample Date	Result	QUAL	Duplicate Result	Duplicate Qualifier	DETLIM	Units	RPD
MW-31	TDS @ 180 C	3/15/2007	1280		1280		10	mg/L	0.00%
MW-27	Tetrahydrofuran	3/21/2006	1	U	1	U	1	mg/L	0.00%
MW-31	Tetrahydrofuran	3/15/2007	10	U	10	U	10	ug/L	0.00%
MW-27	Thallium	3/21/2006	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-31	Thallium	3/15/2007	0.5	U	0.5	U	0.5	ug/L	0.00%
MW-31	Tin	3/15/2007	100	U	100	U	100	ug/L	0.00%
MW-27	Toluene	3/21/2006	1	U	1	U	1	ug/L	0.00%
MW-31	Toluene	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-31	Uranium	3/15/2007	7.6		7.43		0.3	ug/L	2.29%
MW-27	Uranium	3/21/2006	31.3		31.7			ug/L	-1.26%
MW-27	Vanadium	3/21/2006	15	U	15	U	15	ug/L	0.00%
MW-31	Vanadium	3/15/2007	15	U	15	U	15	ug/L	0.00%
MW-31	Xylenes	3/15/2007	1	U	1	U	1	ug/L	0.00%
MW-27	Xylenes, total	3/21/2006	1	U	1	U	1	ug/L	0.00%
MW-27	Zinc	3/21/2006	10	U	10	U	10	ug/L	0.00%
MW-31	Zinc	3/15/2007	10	U	10	U	10	ug/L	0.00%

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-23	**Nutrients (mg/L)**																		
	Ammonia	25	10	70.0%	Normal or Lognormal	0.772	Down			0.18	0.20		0.6		12.5	0.6	0.6	NO	Aitchison's Mean + 2σ
	Nitrate+Nitrite as N	10	9	100.0%	Non Parametric	0.073	None	NA	None				0.3		5	5	5	NO	Permit GWCL
	Heavy Metals (ug/L)																		
	Arsenic	50	11	0.0%	Not Tested			0	None				5		25	25	25	NO	Permit GWCL
	Beryllium	4	11	0.0%	Not Tested			0	None				0.5		2	2	2	NO	Permit GWCL
	Cadmium	5	10	30.0%	Not Tested								1.21		2.5	2.5	2.5	NO	Permit GWCL
	Chromium	100	10	0.0%	Not Tested			NA	None				25		50	50	50	NO	Permit GWCL
	Cobalt	730	10	0.0%	Not Tested			NA	None				10		365	365	365	NO	Permit GWCL
	Copper	1,300	11	0.0%	Not Tested			0	None				10		650	650	650	NO	Permit GWCL
	Iron	11,000	9	0.0%	Not Tested			NA	None				30		5500	5500	5500	NO	Permit GWCL
	Lead	15	9	0.0%	Not Tested			NA	None				1		7.5	7.5	7.5	NO	Permit GWCL
	Manganese	800	9	100.0%	Normal or Lognormal	0.001	None			302.89	123.38		472		400	550	550	NO	Mean + 2σ
	Mercury	2	11	0.0%	Not Tested			0	None				0.5		1	1.0	1.0	NO	Permit GWCL
	Molybdenum	40	10	0.0%	Not Tested			NA	None				10		20	20	20	NO	Permit GWCL
	Nickel	100	11	36.4%	Not Tested								41		50	50	50	NO	Permit GWCL
	Selenium	50	11	63.6%	Non Parametric	0.003	None	-0.56	None				6.5		25	25	25	NO	Permit GWCL
	Silver	100	11	0.0%	Not Tested			0	None				10		50	50	50	NO	Permit GWCL
	Thallium	2	11	36.4%	Not Tested								1.48		1	1.5	1.5	NO	Highest Historical Value
	Uranium	30	10	100.0%	Normal or Lognormal	0.252	None			23.24	4.21		31.8		15	32	32	YES	Mean + 2σ
	Vanadium	60	8	0.0%	Not Tested			NA	None				20		30	30	30	NO	Permit GWCL
	Zinc	5,000	10	100.0%	Normal or Lognormal	0.033	None			36.70	18.56		82		2500	74	74	NO	Mean + 2σ
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	10	80.0%	Normal or Lognormal	0.205	None			1.17	0.85		2.3		7.5	2.86	2.86	NO	Aitchison's Mean + 2σ
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	12	0.0%	Not Tested			0	None				20		350	350	350	NO	Permit GWCL
	Benzene	5	13	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	2-Butanone (MEK)	4,000	13	0.0%	Not Tested			0	None				20		2000	2000	2000	NO	Permit GWCL
	Carbon Tetrachloride	5	13	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Chloroform	70	13	0.0%	Not Tested			0	None				1		35	35	35	NO	Permit GWCL
	Chloromethane	30	12	50.0%	Normal or Lognormal	0.0001	None			1.63	2.04		6.2		15	5.7	15	NO	Permit GWCL
	Dichloromethane	5	13	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Naphthalene	100	13	0.0%	Not Tested			0	None				1		50	50	50	NO	Permit GWCL
	Tetrahydrofuran	46	6	16.7%	Not Tested								6		23	23	23	NO	Permit GWCL
	Toluene	1,000	13	0.0%	Not Tested			0	None				1		500	500	500	NO	Permit GWCL
	Xylenes (total)	10,000	12	0.0%	Not Tested			0	None				1		5000	5000	5000	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	11	90.9%	Non Parametric	0.118	None	0.40	None				10		TBD	10	10	NO	Highest Historical Value
	Fluoride (mg/L)	4	11	90.9%	Non Parametric	0.087	None	-0.095	None	0.31	0.19		0.81		2	0.7	0.7	NO	Mean + 2σ
	pH (s.u.)	6.5 to 8.5	10	100.0%	Normal or Lognormal	0.198	None			7.29	0.32		6.9		TBD	6.5-8.5	5.8-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.587	Up			2224.00	150.20		2460		TBD	2524	2669	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	10	100.0%	Non Parametric	0.221	None	NA	None				3670		TBD	3670	3670	NO	Highest Historical Value

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-24	**Nutrients (mg/L)**																		
	Ammonia	25	9	100.0%	Normal or Lognormal	0.116	None			3.34	1.87		5.76		12.5	7	7	NO	Mean + 2σ
	Nitrate+Nitrite as N	10	11	36.4%	Not Tested								0.8		5	5	5	NO	Permit GWCL
	Heavy Metals (ug/L)																		
	Arsenic	50	12	58.3%	Normal or Lognormal	0.422	Down			5.23	6.02		20.4		25	17	17	NO	Aitchison's Mean + 2σ
	Beryllium	4	11	0.0%	Not Tested			0	None				0.5		2	2	2	NO	Permit GWCL
	Cadmium	5	9	11.1%	Not Tested			NA	None				0.55		2.5	2.5	2.5	NO	Permit GWCL
	Chromium	100	11	0.0%	Not Tested			0	None				25		50	50	50	NO	Permit GWCL
	Cobalt	730	11	18.2%	Not Tested			0	None				13		365	365	365	NO	Permit GWCL
	Copper	1,300	12	0.0%	Not Tested			0	None				10		650	650	650	NO	Permit GWCL
	Iron	11,000	11	100.0%	Normal or Lognormal	0.036	None			1252.64	1454.91		4730		5500	4162	4162	NO	Mean + 2σ
	Lead	15	10	0.0%	Not Tested			NA	None				1		7.5	7.5	7.5	NO	Permit GWCL
	Manganese	800	12	100.0%	Normal or Lognormal	0.332	None			3535.00	1986.09		7640		400	7507	7507	YES	Mean + 2σ
	Mercury	2	10	0.0%	Not Tested			NA	None				0.5		1	1	1	NO	Permit GWCL
	Molybdenum	40	11	0.0%	Not Tested			0	None				10		20	20	20	NO	Permit GWCL
	Nickel	100	10	0.0%	Not Tested			0	None				20		50	50	50	NO	Permit GWCL
	Selenium	50	12	25.0%	Not Tested								6.2		25	25	25	NO	Permit GWCL
	Silver	100	12	0.0%	Not Tested			0	None				10		50	50	50	NO	Permit GWCL
	Thallium	2	11	0.0%	Not Tested			0	None				0.5		1	1	1	NO	Permit GWCL
	Uranium	30	10	100.0%	Normal or Lognormal	0.583	Down			8.97	13.43		46		15	36	36	YES	Mean + 2σ
	Vanadium	60	11	0.0%	Not Tested			0	None				15		30	30	30	NO	Permit GWCL
	Zinc	5,000	11	45.5%	Not Tested								24		2500	2500	2500	NO	Permit GWCL
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	11	27.3%	Not Tested								4.1		7.5	7.5	7.5	NO	Permit GWCL
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	10	10.0%	Not Tested			NA	None				33	25.76	350	350	350	NO	Permit GWCL
	Benzene	5	12	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	2-Butanone (MEK)	4,000	11	0.0%	Not Tested			0	None				20		2000	2000	2000	NO	Permit GWCL
	Carbon Tetrachloride	5	12	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Chloroform	70	12	0.0%	Not Tested			0	None				1		35	35	35	NO	Permit GWCL
	Chloromethane	30	11	45.5%	Not Tested								8.6		15	15	15	NO	Permit GWCL
	Dichloromethane	5	12	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Naphthalene	100	12	0.0%	Not Tested			0	None				1		50	50	50	NO	Permit GWCL
	Tetrahydrofuran	46	5	20.0%	Not Tested								7.4		23	23	23	NO	Permit GWCL
	Toluene	1,000	11	0.0%	Not Tested			0	None				1		500	500	500	NO	Permit GWCL
	Xylenes (total)	10,000	11	0.0%	Not Tested			0	None				1		5000	5000	5000	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	10	100.0%	Non Parametric	0.350	None	NA	Downward				71		TBD	71	71	NO	Highest Historical Value
	Fluoride (mg/L)	4	8	100.0%	Normal or Lognormal	0.237	None			0.22	0.07		0.4		2	0.2	0.3	NO	Mean + 20% of mean
	pH (s.u.)	6.5 to 8.5	10	100.0%	Normal or Lognormal	0.355	None			7.21	0.24		6.9		TBD	6.5-8.5	5.7-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	11	100.0%	Normal or Lognormal	0.008	None			2594.55	154.43		2850		TBD	2903	3113	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.005	None			4116.00	166.95		4340		TBD	4450	4932	NO	Mean + 20% of mean

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-25	**Nutrients (mg/L)**																		
	Ammonia	25	10	100.0%	Normal or Lognormal	0.648	Down			0.61	0.08		0.7		6.25	0.8	0.8	NO	Mean + 2σ
	Nitrate+Nitrite as N	10	11	0.0%	Not Tested			0	None				0.1		2.5	2.5	2.5	NO	Permit GWCL
	Heavy Metals (ug/L)																		
	Arsenic	50	11	0.0%	Not Tested			0	None				5		12.5	12.5	12.5	NO	Permit GWCL
	Beryllium	4	11	0.0%	Not Tested			0	None				0.5		1	1	1	NO	Permit GWCL
	Cadmium	5	10	100.0%	Normal or Lognormal	0.300	None			1.39	0.06		1.46		1.25	1.5	1.7	NO	Mean + 20% of mean
	Chromium	100	11	0.0%	Not Tested			0	None				25		25	25	25	NO	Permit GWCL
	Cobalt	730	11	72.7%	Non Parametric	0.132	None	NA	None				15		182.5	182.5	182.5	NO	Permit GWCL
	Copper	1,300	11	0.0%	Not Tested			0	None				10		325	325	325	NO	Permit GWCL
	Iron	11,000	11	0.0%	Not Tested			0	None				30		2750	2750	2750	NO	Permit GWCL
	Lead	15	11	0.0%	Not Tested			0	None				1		3.75	3.75	3.75	NO	Permit GWCL
	Manganese	800	11	100.0%	Normal or Lognormal	0.033	None			1697.27	54.61		1760		200	1806	2037	YES	Mean + 20% of mean
	Mercury	2	11	0.0%	Not Tested			0	None				0.5		0.5	0.5	0.5	NO	Permit GWCL
	Molybdenum	40	10	100.0%	Non Parametric	0.017	None	0	None				12		10	12	12	NO	Highest Historical Value
	Nickel	100	11	0.0%	Not Tested			0	None				20		25	25	25	NO	Permit GWCL
	Selenium	50	11	0.0%	Not Tested			0	None				5		12.5	12.5	12.5	NO	Permit GWCL
	Silver	100	11	0.0%	Not Tested			0	None				10		25	25	25	NO	Permit GWCL
	Thallium	2	11	100.0%	Normal or Lognormal	0.065	None			1.01	0.04		1.07		0.5	1.1	1.2	NO	Mean + 20% of mean
	Uranium	30	11	100.0%	Normal or Lognormal	0.041	None			5.94	0.27		6.36		7.5	6.5	7.1	NO	Mean + 20% of mean
	Vanadium	60	11	0.0%	Not Tested			0	None				15		15	15	15	NO	Permit GWCL
	Zinc	5,000	10	10.0%	Not Tested			NA	None				11	16.38	1250	1250	1250	NO	Permit GWCL
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	10	20.0%	Not Tested								1.4		3.75	3.75	3.75	NO	Permit GWCL
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	11	0.0%	Not Tested			0	None				20		175	175	175	NO	Permit GWCL
	Benzene	5	11	0.0%	Not Tested			0	None				1		1.25	1.25	1.25	NO	Permit GWCL
	2-Butanone (MEK)	4,000	11	0.0%	Not Tested			0	None				20		1000	1000	1000	NO	Permit GWCL
	Carbon Tetrachloride	5	11	0.0%	Not Tested			0	None				1		1.25	1.25	1.25	NO	Permit GWCL
	Chloroform	70	11	0.0%	Not Tested			0	None				1		17.5	17.5	17.5	NO	Permit GWCL
	Chloromethane	30	10	40.0%	Not Tested								5.8		7.5	7.5	7.5	NO	Permit GWCL
	Dichloromethane	5	11	0.0%	Not Tested			0	None				1		1.25	1.25	1.25	NO	Permit GWCL
	Naphthalene	100	11	0.0%	Not Tested			0	None				1		25	25	25	NO	Permit GWCL
	Tetrahydrofuran	46	11	0.0%	Not Tested			2.65	Upward				10		11.5	TBD	11.5	NO	Permit GWCL
	Toluene	1,000	11	0.0%	Not Tested			0	None				1		250	250	250	NO	Permit GWCL
	Xylenes (total)	10,000	11	0.0%	Not Tested			0	None				1		2500	2500	2500	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	11	100.0%	Normal or Lognormal	0.248	None			32.36	1.21		34		TBD	35	38.8	NO	Mean + 20% of mean
	Fluoride (mg/L)	4	11	100.0%	Normal or Lognormal	0.047	None			0.34	0.04		0.43		1	1.0	1.0	NO	Permit GWCL
	pH (s.u.)	6.5 to 8.5	10	100.0%	Normal or Lognormal	0.420	Down			7.21	0.22		6.9		TBD	6.5-8.5	5.8-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	11	100.0%	Normal or Lognormal	0.110	None			1729.09	101.83		1880		TBD	1933	2075	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	11	100.0%	Normal or Lognormal	0.048	None			2842.73	66.50		2970		TBD	2976	3411	NO	Mean + 20% of mean

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-27	**Nutrients (mg/L)**																		
	Ammonia	25	7	14.3%	Not Tested								0.05		6.25	6.3	6.3	NO	Permit GWCL
	Nitrate+Nitrite as N	10	10	100.0%	Normal or Lognormal	0.357	None			5.05	0.28		5.6		2.5	5.6	6.1	NO	Mean + 20% of mean
	Heavy Metals (ug/L)																		
	Arsenic	50	10	0.0%	Not Tested			NA	None				5		12.5	12.5	12.5	NO	Permit GWCL
	Beryllium	4	10	0.0%	Not Tested			NA	None				0.5		1	1	1	NO	Permit GWCL
	Cadmium	5	10	0.0%	Not Tested			NA	None				0.5		1.25	1.25	1.25	NO	Permit GWCL
	Chromium	100	10	0.0%	Not Tested			NA	None				25		25	25	25	NO	Permit GWCL
	Cobalt	730	10	0.0%	Not Tested			NA	None				10		182.5	182.5	182.5	NO	Permit GWCL
	Copper	1,300	10	0.0%	Not Tested			NA	None				10		325	325	325	NO	Permit GWCL
	Iron	11,000	10	0.0%	Not Tested			NA	None				30		2750	2750	2750	NO	Permit GWCL
	Lead	15	10	0.0%	Not Tested			NA	None				1		3.75	3.75	3.75	NO	Permit GWCL
	Manganese	800	10	0.0%	Not Tested			NA	None				10		200	200	200	NO	Permit GWCL
	Mercury	2	10	0.0%	Not Tested			NA	None				0.5		0.5	0.5	0.5	NO	Permit GWCL
	Molybdenum	40	10	0.0%	Not Tested			NA	None				10		10	10	10	NO	Permit GWCL
	Nickel	100	10	0.0%	Not Tested			NA	None				20		25	25	25	NO	Permit GWCL
	Selenium	50	10	100.0%	Normal or Lognormal	0.027	None			10.73	0.74		11.9		12.5	12.2	12.9	NO	Mean + 20% of mean
	Silver	100	10	0.0%	Not Tested			NA	None				10		25	25	25	NO	Permit GWCL
	Thallium	2	10	0.0%	Not Tested			NA	None				0.5		0.5	0.5	0.5	NO	Permit GWCL
	Uranium	30	10	100.0%	Normal or Lognormal	0.016	None			31.40	1.14		33.1		7.5	34	37.7	YES	Mean + 20% of mean
	Vanadium	60	10	0.0%	Not Tested			NA	None				15		15	15	15	NO	Permit GWCL
	Zinc	5,000	9	0.0%	Not Tested			NA	None				10		1250	1250	1250	NO	Permit GWCL
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	9	66.7%	Normal or Lognormal	0.276	None			0.72	0.63		1.5		3.75	2	2	NO	Aitchison's Mean + 2σ
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	10	0.0%	Not Tested			NA	None				20		175	175	175	NO	Permit GWCL
	Benzene	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	2-Butanone (MEK)	4,000	10	0.0%	Not Tested			NA	None				20		1000	1000	1000	NO	Permit GWCL
	Carbon Tetrachloride	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	Chloroform	70	9	0.0%	Not Tested			NA	None				1		17.5	17.5	17.5	NO	Permit GWCL
	Chloromethane	30	9	44.4%	Not Tested								4.4		7.5	7.5	7.5	NO	Permit GWCL
	Dichloromethane	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	Naphthalene	100	10	0.0%	Not Tested			NA	None				1		25	25	25	NO	Permit GWCL
	Tetrahydrofuran	46	10	0.0%	Not Tested			NA	Upward				10		11.5	TBD	11.5	NO	Permit GWCL
	Toluene	1,000	10	0.0%	Not Tested			NA	None				1		250	250	250	NO	Permit GWCL
	Xylenes (total)	10,000	10	0.0%	Not Tested			NA	None				1		2500	2500	2500	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.316	None			34.70	1.64		37		TBD	38	41.6	NO	Mean + 20% of mean
	Fluoride (mg/L)	4	10	100.0%	Normal or Lognormal	0.099	None			0.75	0.05		0.8		1	1.0	1.0	NO	Permit GWCL
	pH (s.u.)	6.5 to 8.5	9	100.0%	Normal or Lognormal	0.746	Down			7.65	0.17		7.4		TBD	6.5-8.5	6.1-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.239	None			405.20	28.37		452		TBD	462	486	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.007	None			1019.40	27.79		1050		TBD	1075	1223	NO	Mean + 20% of mean

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-28	**Nutrients (mg/L)**																		
	Ammonia	25	10	90.0%	Non Parametric	0.782	Down	NA	None				0.27		12.5	12.5	12.5	NO	Permit GWCL
	Nitrate+Nitrite as N	10	12	91.7%	Non Parametric	0.003	None	0.31	None				0.4		5	5	5	NO	Permit GWCL
	Heavy Metals (ug/L)																		
	Arsenic	50	10	100.0%	Normal or Lognormal	0.223	None			14.84	2.88		18.6		25	21	21	NO	Mean + 2σ
	Beryllium	4	11	0.0%	Not Tested			0	None				0.5		2	2	2	NO	Permit GWCL
	Cadmium	5	11	100.0%	Normal or Lognormal					3.29	0.95		4.68		2.5	5.2	5.2	YES	Mean + 2σ
	Chromium	100	11	0.0%	Not Tested			0	None				25		50	50	50	NO	Permit GWCL
	Cobalt	730	11	100.0%	Normal or Lognormal					31.27	7.76		44		365	47	47	NO	Mean + 2σ
	Copper	1,300	11	0.0%	Not Tested			NA	None				10		650	650	650	NO	Permit GWCL
	Iron	11,000	11	81.8%	Normal or Lognormal	0.106	None			115.67	91.91		277		5500	299	299	NO	Cohen's Mean + 2σ
	Lead	15	11	27.3%	Not Tested								2		7.5	7.5	7.5	NO	Permit GWCL
	Manganese	800	11	100.0%	Normal or Lognormal	0.009	None			1528.18	154.46		1800		400	1837	1837	YES	Mean + 2σ
	Mercury	2	11	0.0%	Not Tested			0	None				0.5		1	1	1	NO	Permit GWCL
	Molybdenum	40	10	0.0%	Not Tested			NA	None				10		20	20	20	NO	Permit GWCL
	Nickel	100	11	90.9%	Non Parametric	0.035	None	-0.39	None				36		50	50	50	NO	Permit GWCL
	Selenium	50	11	72.7%	Normal or Lognormal	0.012	None			4.74	3.20		8		25	11.1	11.1	NO	Aitchison's Mean + 2σ
	Silver	100	11	0.0%	Not Tested			0	None				10		50	50	50	NO	Permit GWCL
	Thallium	2	11	100.0%	Normal or Lognormal	0.005	None			0.86	0.07		0.98		1	1.0	1.0	NO	Mean + 2σ
	Uranium	30	11	100.0%	Normal or Lognormal					3.67	0.61		4.89		15	4.9	4.9	NO	Mean + 2σ
	Vanadium	60	11	0.0%	Not Tested			0	None				15		30	30	30	NO	Permit GWCL
	Zinc	5,000	11	100.0%	Normal or Lognormal	0.008	None			46.36	18.26		80		2500	83	83	NO	Mean + 2σ
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	10	80.0%	Normal or Lognormal	0.049	None			1.01	0.70		2		7.5	2.42	2.42	NO	Aitchison's Mean + 2σ
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	11	0.0%	Not Tested			0	None				20		350	350	350	NO	Permit GWCL
	Benzene	5	11	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	2-Butanone (MEK)	4,000	11	0.0%	Not Tested			0	None				20		2000	2000	2000	NO	Permit GWCL
	Carbon Tetrachloride	5	11	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Chloroform	70	11	0.0%	Not Tested			0	None				1		35	35	35	NO	Permit GWCL
	Chloromethane	30	11	54.5%	Normal or Lognormal	0.395	Down			1.47	1.57		4		15	4.6	15	NO	Permit GWCL
	Dichloromethane	5	11	0.0%	Not Tested			0	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Naphthalene	100	11	0.0%	Not Tested			0	None				1		50	50	50	NO	Permit GWCL
	Tetrahydrofuran	46	11	0.0%	Not Tested			2.65	Upward				10		23	TBD	23	NO	Permit GWCL
	Toluene	1,000	11	0.0%	Not Tested			0	None				1		500	500	500	NO	Permit GWCL
	Xylenes (total)	10,000	11	0.0%	Not Tested			0	None				1		5000	5000	5000	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	11	100.0%	Normal or Lognormal	0.263	None			89.09	8.18		99		TBD	105	107	NO	Mean + 20% of mean
	Fluoride (mg/L)	4	11	100.0%	Normal or Lognormal	0.065	None			0.63	0.05		0.7		2	2.0	2.0	NO	Permit GWCL
	pH (s.u.)	6.5 to 8.5	11	100.0%	Normal or Lognormal	0.364	Down			6.73	0.32		6.3		TBD	6.5-8.5	5.4-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.111	None			2361.00	85.82		2520		TBD	2533	2833	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	11	100.0%	Normal or Lognormal	0.011	None			3677.27	87.30		3800		TBD	3852	4413	NO	Mean + 20% of mean

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-29	**Nutrients (mg/L)**																		
	Ammonia	25	9	100.0%	Normal or Lognormal	0.672	Down			0.99	0.13		1.2		12.5	1.3	1.3	NO	Mean + 2σ
	Nitrate+Nitrite as N	10	10	0.0%	Not Tested								0.1		5	5	5	NO	Permit GWCL
	Heavy Metals (ug/L)																		
	Arsenic	50	9	0.0%	Not Tested			NA	None				5		25	25	25	NO	Permit GWCL
	Beryllium	4	9	0.0%	Not Tested			NA	None				0.5		2	2	2	NO	Permit GWCL
	Cadmium	5	9	0.0%	Not Tested			NA	None				0.71		2.5	2.5	2.5	NO	Permit GWCL
	Chromium	100	10	0.0%	Not Tested			NA	None				25		50	50	50	NO	Permit GWCL
	Cobalt	730	9	0.0%	Not Tested			NA	None				10		365	365	365	NO	Permit GWCL
	Copper	1,300	10	0.0%	Not Tested			NA	None				10		650	650	650	NO	Permit GWCL
	Iron	11,000	10	100.0%	Normal or Lognormal	0.071	None			1252.90	308.17		1790		5500	1869	1869	NO	Mean + 2σ
	Lead	15	10	0.0%	Not Tested			NA	None				1		7.5	7.5	7.5	NO	Permit GWCL
	Manganese	800	9	100.0%	Normal or Lognormal	0.407	None			5027.78	298.32		5720		400	5624	6033	YES	Mean + 20% of mean
	Mercury	2	10	0.0%	Not Tested			NA	None				0.5		1	1	1	NO	Permit GWCL
	Molybdenum	40	9	0.0%	Not Tested			NA	None				10		20	20	20	NO	Permit GWCL
	Nickel	100	9	0.0%	Not Tested			NA	None				20		50	50	50	NO	Permit GWCL
	Selenium	50	8	0.0%	Not Tested			NA	None				5		25	25	25	NO	Permit GWCL
	Silver	100	10	0.0%	Not Tested			NA	None				10		50	50	50	NO	Permit GWCL
	Thallium	2	10	30.0%	Not Tested								1.23		1	1.2	1.2	NO	Highest Historical Value
	Uranium	30	8	100.0%	Non Parametric	0.068	None	NA	None				12.1		15	15	15	NO	Permit GWCL
	Vanadium	60	10	0.0%	Not Tested			NA	None				15		30	30	30	NO	Permit GWCL
	Zinc	5,000	9	88.9%	Normal or Lognormal	0.016	None			15.11	7.27		32		2500	30	30	NO	Mean + 2σ
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	9	55.6%	Normal or Lognormal	0.319	None			0.72	0.63		2.8		7.5	2	2	NO	Aitchison's Mean + 2σ
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	10	0.0%	Not Tested			NA	None				20		350	350	350	NO	Permit GWCL
	Benzene	5	10	0.0%	Not Tested			NA	None				1		2.5	2.5	2.5	NO	Permit GWCL
	2-Butanone (MEK)	4,000	10	0.0%	Not Tested			NA	None				20		2000	2000	2000	NO	Permit GWCL
	Carbon Tetrachloride	5	10	0.0%	Not Tested			NA	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Chloroform	70	10	0.0%	Not Tested			NA	None				1		35	35	35	NO	Permit GWCL
	Chloromethane	30	9	44.4%	Not Tested								8.2		15	15	15	NO	Permit GWCL
	Dichloromethane	5	10	0.0%	Not Tested			NA	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Naphthalene	100	10	0.0%	Not Tested			NA	None				1		50	50	50	NO	Permit GWCL
	Tetrahydrofuran	46	10	0.0%	Not Tested			NA	Upward				10		23	TBD	23	NO	Permit GWCL
	Toluene	1,000	10	0.0%	Not Tested			NA	None				1		500	500	500	NO	Permit GWCL
	Xylenes (total)	10,000	10	0.0%	Not Tested			NA	None				1		5000	5000	5000	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.165	None			38.30	1.57		41		TBD	41	46.0	NO	Mean + 20% of mean
	Fluoride (mg/L)	4	10	100.0%	Normal or Lognormal	0.078	None			0.85	0.11		1.1		2	1.1	1.1	NO	Mean + 2σ
	pH (s.u.)	6.5 to 8.5	9	100.0%	Normal or Lognormal	0.303	None			6.98	0.26		6.5		TBD	6.5-8.5	5.6-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.053	None			2785.00	80.73		2980		TBD	2946	3342	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	8	100.0%	Non Parametric	0.025	None	NA	None				4400		TBD	4400	4400	NO	Highest Historical Value

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-30	**Nutrients (mg/L)**																		
	Ammonia	25	9	55.6%	Normal or Lognormal	0.068	None			0.04	0.05		0.11		6.25	0.14	0.14	NO	Aitchison's Mean + 2σ
	Nitrate+Nitrite as N	10	10	100.0%	Normal or Lognormal	0.794	Up			13.97	0.83		14.9		2.5	15.63	16.7	YES	Mean + 20% of mean
	Heavy Metals (ug/L)																		
	Arsenic	50	10	0.0%	Not Tested			NA	None				5		12.5	12.5	12.5	NO	Permit GWCL
	Beryllium	4	10	0.0%	Not Tested			NA	None				0.5		1	1	1	NO	Permit GWCL
	Cadmium	5	9	0.0%	Not Tested			NA	None				0.5		1.25	1.25	1.25	NO	Permit GWCL
	Chromium	100	10	0.0%	Not Tested			0	None				25		25	25	25	NO	Permit GWCL
	Cobalt	730	10	0.0%	Not Tested								10		182.5	182.5	182.5	NO	Permit GWCL
	Copper	1,300	10	0.0%	Not Tested			NA	None				10		325	325	325	NO	Permit GWCL
	Iron	11,000	10	90.0%	Normal or Lognormal	0.414	Up			75.60	44.01		127		2750	TBD	2750	NO	Permit GWCL
	Lead	15	9	0.0%	Not Tested			NA	None				1		3.75	3.75	3.75	NO	Permit GWCL
	Manganese	800	10	90.0%	Normal or Lognormal	0.336	None			30.40	15.48		54		200	61	61	NO	Mean + 2σ
	Mercury	2	10	0.0%	Not Tested			NA	None				0.5		0.5	0.5	0.5	NO	Permit GWCL
	Molybdenum	40	10	0.0%	Not Tested			NA	None				10		10	10	10	NO	Permit GWCL
	Nickel	100	10	0.0%	Not Tested			NA	None				20		25	25	25	NO	Permit GWCL
	Selenium	50	10	100.0%	Normal or Lognormal	0.052	None			30.72	1.84		34.6		12.5	34	36.9	NO	Mean + 20% of mean
	Silver	100	10	0.0%	Not Tested			NA	None				10		25	25	25	NO	Permit GWCL
	Thallium	2	10	0.0%	Not Tested			NA	None				0.5		0.5	0.5	0.5	NO	Permit GWCL
	Uranium	30	10	100.0%	Normal or Lognormal	0.070	None			7.04	0.64		8		7.5	8.32	8.5	NO	Mean + 20% of mean
	Vanadium	60	10	0.0%	Not Tested			NA	None				15		15	15	15	NO	Permit GWCL
	Zinc	5,000	10	0.0%	Not Tested			NA	None				10		1250	1250	1250	NO	Permit GWCL
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	9	22.2%	Not Tested								1.8		3.75	3.75	3.75	NO	Permit GWCL
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	10	0.0%	Not Tested			NA	None				20		175	175	175	NO	Permit GWCL
	Benzene	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	2-Butanone (MEK)	4,000	10	0.0%	Not Tested			NA	None				20		1000	1000	1000	NO	Permit GWCL
	Carbon Tetrachloride	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	Chloroform	70	10	0.0%	Not Tested			NA	None				1		17.5	17.5	17.5	NO	Permit GWCL
	Chloromethane	30	9	44.4%	Not Tested								3.1		7.5	7.5	7.5	NO	Permit GWCL
	Dichloromethane	5	10	0.0%	Not Tested			NA	None				1		1.3	1.3	1.3	NO	Permit GWCL
	Naphthalene	100	10	0.0%	Not Tested			NA	None				1		25	25	25	NO	Permit GWCL
	Tetrahydrofuran	46	10	0.0%	Not Tested			NA	Upward				10		11.5	TBD	11.5	NO	Permit GWCL
	Toluene	1,000	10	0.0%	Not Tested			NA	None				1		250	250	250	NO	Permit GWCL
	Xylenes (total)	10,000	10	0.0%	Not Tested			NA	None				1		2500	2500	2500	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	9	100.0%	Normal or Lognormal	0.185	None			124.89	1.62		128		TBD	128	150	NO	Mean + 20% of mean
	Fluoride (mg/L)	4	10	100.0%	Normal or Lognormal	0.033	None			0.39	0.06		0.5		1	1.0	1.0	NO	Permit GWCL
	pH (s.u.)	6.5 to 8.5	9	100.0%	Normal or Lognormal	0.317	None			7.36	0.30		6.9		TBD	6.5-8.5	5.9-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.224	None			883.20	44.51		977		TBD	972	1060	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.603	Down			1745.00	86.70		1940		TBD	1918	2094	NO	Mean + 20% of mean

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-31	**Nutrients (mg/L)**																		
	Ammonia	25	7	14.3%	Not Tested								0.05		6.25	6.25	6.25	NO	Permit GWCL
	Nitrate+Nitrite as N	10	10	100.0%	Normal or Lognormal					23.94	1.09		25.3		2.5	26	28.7	YES	Mean + 20% of mean
	Heavy Metals (ug/L)																		
	Arsenic	50	10	0.0%	Not Tested			NA	None				5		12.5	12.5	12.5	NO	Permit GWCL
	Beryllium	4	10	0.0%	Not Tested			NA	None				0.5		1	1	1	NO	Permit GWCL
	Cadmium	5	10	0.0%	Not Tested			NA	None				0.5		1.25	1.25	1.25	NO	Permit GWCL
	Chromium	100	9	0.0%	Not Tested			NA	None				25		25	25	25	NO	Permit GWCL
	Cobalt	730	10	0.0%	Not Tested								10		182.5	182.5	182.5	NO	Permit GWCL
	Copper	1,300	10	0.0%	Not Tested			NA	None				10		325	325	325	NO	Permit GWCL
	Iron	11,000	10	0.0%	Not Tested			NA	None				30		2750	2750	2750	NO	Permit GWCL
	Lead	15	10	0.0%	Not Tested			NA	None				1		3.75	3.75	3.75	NO	Permit GWCL
	Manganese	800	10	0.0%	Not Tested			NA	None				10		200	200	200	NO	Permit GWCL
	Mercury	2	10	0.0%	Not Tested			NA	None				0.5		0.5	0.5	0.5	NO	Permit GWCL
	Molybdenum	40	10	0.0%	Not Tested			NA	None				10		10	10	10	NO	Permit GWCL
	Nickel	100	10	0.0%	Not Tested			NA	None				20		25	25	25	NO	Permit GWCL
	Selenium	50	10	100.0%	Normal or Lognormal	0.228	None			62.64	4.24		70.1		12.5	71	71.0	YES	Mean + 2σ
	Silver	100	10	0.0%	Not Tested			NA	None				10		25	25	25	NO	Permit GWCL
	Thallium	2	10	0.0%	Not Tested			NA	None				0.5		0.5	0.5	0.5	NO	Permit GWCL
	Uranium	30	10	100.0%	Normal or Lognormal	0.007	None			7.62	0.75		9.32		7.5	9.1	9.1	NO	Mean + 2σ
	Vanadium	60	9	0.0%	Not Tested			NA	None				15		15	15	15	NO	Permit GWCL
	Zinc	5,000	8	0.0%	Not Tested			NA	None				10		1250	1250	1250	NO	Permit GWCL
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	8	0.0%	Not Tested			NA	None				1		3.75	3.75	3.75	NO	Permit GWCL
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	10	0.0%	Not Tested			NA	None				20		175	175	175	NO	Permit GWCL
	Benzene	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	2-Butanone (MEK)	4,000	10	0.0%	Not Tested			NA	None				20		1000	1000	1000	NO	Permit GWCL
	Carbon Tetrachloride	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	Chloroform	70	10	0.0%	Not Tested			NA	None				1		17.5	17.5	17.5	NO	Permit GWCL
	Chloromethane	30	9	55.6%	Normal or Lognormal	0.490	Down			1.71	2.18		5.9		7.5	6.1	7.5	NO	Permit GWCL
	Dichloromethane	5	10	0.0%	Not Tested			NA	None				1		1.25	1.25	1.25	NO	Permit GWCL
	Naphthalene	100	10	0.0%	Not Tested			NA	None				1		25	25	25	NO	Permit GWCL
	Tetrahydrofuran	46	10	0.0%	Not Tested			NA	Upward				10		11.5	TBD	11.5	NO	Permit GWCL
	Toluene	1,000	10	0.0%	Not Tested			NA	None				1		250	250	250	NO	Permit GWCL
	Xylenes (total)	10,000	10	0.0%	Not Tested			NA	None				1		2500	2500	2500	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	10	100.0%	Normal or Lognormal	0.405	Down			132.90	5.22		139		TBD	143	159	NO	Mean + 20% of mean
	Fluoride (mg/L)	4	10	100.0%	Non Parametric	0.097	None	NA	None	0.93	0.10		1.2		1	1.2	1.2	NO	Highest Historical Value
	pH (s.u.)	6.5 to 8.5	9	100.0%	Normal or Lognormal	0.166	None			7.49	0.35		6.8		TBD	6.5-8.5	6.0-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	10	100.0%	Non Parametric	0.233	None	NA	None				532		TBD	532	532	NO	Highest Historical Value
	TDS @ 180 C (mg/L)	TBD	10	100.0%	Non Parametric	0.422	Down	NA	None				1320		TBD	1320	1320	NO	Highest Historical Value

Table 10
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detected	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Explanation of Mean	Highest Observed Value (lowest for pH)	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL	Proposed GWCL Exceeds GWQS	Comment
MW-3A	**Nutrients (mg/L)**																		
	Ammonia	25	9	77.8%	Normal or Lognormal	0.476	Down			0.20	0.19		0.61		12.5	0.6	0.6	NO	Aitchison's Mean + 2σ
	Nitrate+Nitrite as N	10	8	100.0%	Normal or Lognormal	0.157	None			1.00	0.16		1.2		5	1.3	1.3	NO	Mean + 2σ
	Heavy Metals (ug/L)																		
	Arsenic	50	9	0.0%	Not Tested			NA	None				5		25	25	25	NO	Permit GWCL
	Beryllium	4	9	44.4%	Not Tested								1.32		2	2	2	NO	Permit GWCL
	Cadmium	5	9	66.7%	Normal or Lognormal	0.053	None			1.53	3.38		6.86		2.5	8.3	8.3	YES	Cohen's Mean + 2σ
	Chromium	100	8	0.0%	Not Tested			NA	None				25		50	50	50	NO	Permit GWCL
	Cobalt	730	9	33.3%	Not Tested								36		365	365	365	NO	Permit GWCL
	Copper	1,300	8	0.0%	Not Tested			NA	None				10		650	650	650	NO	Permit GWCL
	Iron	11,000	8	0.0%	Not Tested			NA	None				30		5500	5500	5500	NO	Permit GWCL
	Lead	15	9	0.0%	Not Tested			NA	None				1		7.5	7.5	7.5	NO	Permit GWCL
	Manganese	800	9	100.0%	Normal or Lognormal	0.531	Down			1772.89	2257.26		6520		400	6287	6287	YES	Mean + 2σ
	Mercury	2	9	0.0%	Not Tested			NA	None				0.5		1	1	1	NO	Permit GWCL
	Molybdenum	40	9	0.0%	Not Tested			NA	None				10		20	20	20	NO	Permit GWCL
	Nickel	100	9	55.6%	Normal or Lognormal	0.476	Down			33.78	35.67		82		50	105	105	YES	Aitchison's Mean + 2σ
	Selenium	50	8	100.0%	Normal or Lognormal	0.007	None			71.76	8.75		81.7		25	89	89	YES	Mean + 2σ
	Silver	100	9	0.0%	Not Tested			NA	None				10		50	50	50	NO	Permit GWCL
	Thallium	2	9	77.8%	Normal or Lognormal	0.327	None			0.62	0.38		1.01		1.0	1.4	1.4	NO	Aitchison's Mean + 2σ
	Uranium	30	8	100.0%	Normal or Lognormal	0.135	None			24.68	5.10		35.2		15	35	35	YES	Mean + 2σ
	Vanadium	60	8	0.0%	Not Tested			NA	None				15		30	30	30	NO	Permit GWCL
	Zinc	5,000	9	100.0%	Normal or Lognormal	0.328	None			71.89	41.40		141		2500	155	155	NO	Mean + 2σ
	Radiologics (pCi/L)																		
	Gross Alpha minus Rn & U	15	8	12.5%	Not Tested								1.0		7.5	7.5	7.5	NO	Permit GWCL
	Volatile Organic Compounds (ug/L)																		
	Acetone	700	9	0.0%	Not Tested			0	None				20		350	350	350	NO	Permit GWCL
	Benzene	5	9	0.0%	Not Tested			NA	None				1		2.5	2.5	2.5	NO	Permit GWCL
	2-Butanone (MEK)	4,000	9	0.0%	Not Tested			0	None				20		2000	2000	2000	NO	Permit GWCL
	Carbon Tetrachloride	5	9	0.0%	Not Tested			NA	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Chloroform	70	7	0.0%	Not Tested								1		35	35	35	NO	Permit GWCL
	Chloromethane	30	8	75.0%	Normal or Lognormal	0.486	None			2.22	3.58		5.8		15	9.4	15	NO	Permit GWCL
	Dichloromethane	5	9	0.0%	Not Tested			NA	None				1		2.5	2.5	2.5	NO	Permit GWCL
	Naphthalene	100	9	0.0%	Not Tested			NA	None				1		50	50	50	NO	Permit GWCL
	Tetrahydrofuran	46	5	40.0%	Not Tested								5		23	23	23	NO	Permit GWCL
	Toluene	1,000	8	0.0%	Not Tested			NA	None				1		500	500	500	NO	Permit GWCL
	Xylenes (total)	10,000	9	0.0%	Not Tested			NA	None				1		5000	5000	5000	NO	Permit GWCL
	Other																		
	Chloride (mg/L)	TBD	9	100.0%	Normal or Lognormal	0.010	None			61.44	4.13		70		TBD	70	73.7	NO	Mean + 20% of mean
	Fluoride (mg/L)	4	8	100.0%	Normal or Lognormal	0.117	None			1.28	0.18		1.6		2.0	1.6	1.6	NO	Mean + 2σ
	pH (s.u.)	6.5 to 8.5	8	100.0%	Normal or Lognormal	0.786	Down			7.23	0.23		6.9		TBD	6.5-8.5	5.8-8.5	NO	Mean - 20% of mean
	Sulfate (mg/L)	TBD	8	100.0%	Normal or Lognormal	0.007	None			3455.00	92.43		3560		TBD	3640	4143	NO	Mean + 20% of mean
	TDS @ 180 C (mg/L)	TBD	9	100.0%	Normal or Lognormal	0.077	None			5547.78	128.53		5770		TBD	5805	6657	NO	Mean + 20% of mean

Notes:

1 = The Shapiro-Wilk Distribution test was performed on data with % Detect > 50%. For % Detect > 85%, 1/2 the detection limit was substituted for non-detected values, and for % Detect > 50% and < 85% the test was done on detected values only

2 = A regression test was performed on data that was determined to have either a normal or log-normal distribution and % Detect > 50%. 1/2 of the detection limit was used for non-detected values

3 = The Mann-Kendall test was performed on data with either a non-parametric distribution or with % Detect < 50%, it was not performed on constituents where N < 8

GWQS = Ground Water Quality Standard
N = Number of occurrences in the database
% Detect = The percent at which a constituent was detected in a given well
Distribution = Distribution as determined by the Shapiro-Wilk distribution test for constituents with % Detect > 50% and N>8
r2 = The measure of how well the trendline fits the data for regression analysis, where r2 = 1 represents a perfect fit
Regression Trend = The result of the linear regression test analysis using 1/2 of the detection limit for values reported as "not detected"
Z-Score = The value for the Mann-Kendall test that indicates the direction and significance of the trend where z > 1.65 indicates a significant upward trend and z < -1.65 indicates a significant downward trend at the 95% conf. interval. N/A indicates the data did not return a Z-value.
Mann-Kendall Trend = The result of the Mann-Kendall test for non-parametric distributions and for % Detect < 50%
Mean = The arithmatic, Cohen, or Aitchison mean as determined for normally or log-normally distributed constituents with % Detect > 50%
Standard Deviation = The standard deviation as determined for normally or log-normally distributed constituents with % Detect > 85%
Explanation of Mean = The method used to calculate the mean and standard deviation
Highest Observed Value = The highest observed value for constituents with % Detect < 50%
Poisson Limit = The calculated highest value for constituents with % Detect < 10% and assuming a Poisson distribution
Permit GWCL = The Groundwater Compliance Limit as defined in Permit No. UGW370004
Flow Sheet GWCL = The Groundwater Compliance Limit as determined by the Flow Sheet for calculating the GWCL based on the % Detect
Proposed GWCL = The proposed Groundwater Compliance Limit based on the UDEQ-Approved flow sheet and the discussion in Section 2.3 and 2.4 of this Report
Cohen's Mean and Standard Deviation = The mean and standard deviation as determined by the Cohen adjustment for non-detected values for constituents with 50 to 85% detects when the censored probability plot is more linear than the probability plot of detected values only.
Aitchison's Mean and Standard Deviation= The mean and standard deviation as determined by the Aitchison adjustment for non-detected values for constituents with 50 to 85% detects when the probability plot of detected values only is more linear than the censored probability plot.
Yellow Highlight = Significantly increasing (or decreasing in the case of pH) trends and cases where the proposed GWCL exceeds the GWQS.
Purple Highlight= Cases where flowsheet GWCL has been modified to 20 % + or - the mean as discussed in Section 2.4 of this report.

Appendix B

Linear Regressions

Substituting Half the MDL for Non-detected Values

(Regression Plots for Wells and Constituents with 15-50% Non-detects are Considered Exploratory Statistics)

Appendix C
Probability Plots
Substituting Half the MDL for Non-detected Values

Appendix D

Histograms

Exploratory Statistics Substituting Half the MDL for Non-detected Values

Appendix E

Data That Have Been Removed or Modified Prior to Statistical Analyses

Appendix F
Statistica© Input and Output Files
(Electronic Only)