To: Loren Morton, UDRC File: 39400260.10200

From: Robert Sobocinski and Brian Harper

Date: June 16, 2008

Re: Completeness Review for the Revised Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corporation's White Mesa Mill Site, San Juan County, Utah

Based on comments provided by the Utah Division of Radiation Control (the Division) in letters dated August 10 and August 24, 2007, Denison Mines (USA) Corporation (DUSA) submitted the *Revised Background Groundwater Quality Report: Existing Wells for DUSA's White Mesa Mill Site, San Juan County, Utah* (the Revised Background Report) to the Division in October 2007. URS has performed a completeness review of the Revised Background Report. This is a revised version of the completeness review issued on April 30, 2008. Findings and observations from the review are as follows.

1. DUSA performed the data evaluation and statistical analysis in accordance with the statistical process flowchart (attached Figure 19[1]) conditionally approved by the Division on August 24, 2007. The statistical analysis was performed in accordance with U.S. Environmental Protection Agency (EPA) guidance and adequately addressed the presence and variable percentage of non-detect values in the background water quality data sets.

2. There are 13 wells with 38 constituents for each well, resulting in 494 individual data sets, each of which has a corresponding Groundwater Compliance Limit (GWCL) proposed by DUSA in Table 16 of the Revised Background Report. Each data set represents a single constituent at a single well (e.g., uranium at MW-05). For the most part, the proposed GWCLs appear to have been calculated correctly following the flow chart process. However, there are some GWCLs (24 out of a total of 494) where the wrong approach (e.g., highest historic value instead of the Poisson limit) was used to determine the GWCL. These incorrect GWCLs are listed in attached Table 1 along with the correct GWCL. The incorrect GWCLs appear to be the result of inadvertent errors and not due to a misunderstanding or deliberate misrepresentation. Attached Table 1 also contains corrections that appear to be simple errors (see items 7 and 8 below).

3. Attached Table 2 categorizes the GWCLs based on the percentage of non-detects and the statistical approach. Table 2 assumes the 24 flowchart errors have been corrected and that the issues listed in items 5, 6, 7, and 8 below have been addressed (see attached Table 1). The following observations are made from Table 2:

    - Most of the data sets consist of a majority of non-detects. Slightly more than half of the 494 data sets consist of greater than 90% non-detects.

[1] Intera Figure 19 included herein has been updated to reflect the requirements of the August 24, 2007 DRC Conditional Approval.

- Largely because most data sets consist of a majority of non-detects, only 16.4% of the 494 proposed GWCLs were established as a mean plus two standard deviations. These GWCLs were calculated following the first two paths shown on the attached Figure 19 flowchart.

- 28.9% of the 494 proposed GWCLs were established following the "Non-Parametric Statistics" approach (third path on the attached Figure 19 flowchart): 10.1% were the highest historical result in the data set (based on the non-parametric statistical method), and 18.8% were established as a fraction of the Groundwater Quality Standard (GWQS) as allowed by the process shown on the flowchart. The conditionally approved process allows the option of using the greater of the highest historical result or the fraction of the GWQS to represent the GWCL.

- 53.8% of the 494 proposed GWCLs were established following the fourth path of the attached flowchart (non-detects > 90%): 2.0% of the GWCLs were calculated as the Poisson prediction limit, and 51.8% were established as a fraction of the GWQS as allowed by the process shown on the Figure 19 flowchart. The fact that over half of the GWCLs were established as a fraction of the GWQS following the fourth path on the flowchart illustrates that for many constituents, the data sets consist of primarily non-detected results.

4. Attached Table 3 shows that 16 of the proposed GWCLs (about 3.2% of the total) are higher than the respective GWQSs. Refer to attached Table 2 for the breakdown by approach of these GWCLs that exceed the GWQS.

5. For cadmium in wells MW-1, MW-2, MW-3, and MW-5, it appears that the proposed GWCL exceeds the GWQS because of the extreme concentration range observed in the early data (pre-March 1982). For this reason, URS removed the pre-March 1982 data from the cadmium data sets for the four wells and revised the GWCL. The revised GWCLs, which are less than the GWQS, are listed in attached Table 1.

6. The proposed GWCLs for tetrahydrofuran in wells MW-1 and MW-3 exceed the GWQS, and in wells MW-5 and MW-12, the proposed GWCLs exceed the fraction of the GWQS. Because tetrahydrofuran is a man-made chemical, and the purpose of the groundwater monitoring is detection monitoring, the GWCL should be set at the fraction of the GWQS (see attached Table 1). In general, based on the assumption that background levels of man-made organic chemicals (with the possible exception of chlorofluorocarbons) are not present in detectable concentrations in groundwater at the White Mesa Mill Site, the GWCLs for all organic chemicals should be set at the fraction of the GWQS. This would include the organic chemicals in well MW-26 not associated with the chloroform plume remediation. In accordance with Utah Administrative Code R317-6-6.15.F, the GWCL for chloroform, chloromethane (degradation product), dichloromethane (degradation product), and carbon tetrachloride (trace co-contaminant) in well MW-26 should be set at the GWQS. Well MW-26 is discussed further in item 10 below.

7. For cobalt, the correct approach for establishing the compliance limit (fraction of the GWQS) is identified in wells MW-2, MW-3, MW-12, MW-14, MW-15, MW-17, and MW-26; however, there is a typographical error in the value of the GWCL. The fraction of the standard for cobalt for these wells should be 365 micrograms per liter (μg/L) instead of 362 μg/L (see attached Table 1).

8. For xylenes, the correct approach for establishing the compliance limit (fraction of the GWQS) is identified for all the wells; however, there is a typographical error in the value of the GWCL for each of the wells. For Class II groundwater (MW-1, MW-5, and MW-11), the fraction of the GWQS should be 2,500 μg/L instead of 2.5 μg/L, and for Class III groundwater (MW-2, MW-3, MW-12, MW-14, MW-15, MW-17, MW-18, MW-19, MW-26, and MW-32), the fraction of the GWQS should be 5,000 μg/L instead of 5 μg/L (see attached Table 1).

9. In Section 9.3 of the Revised Background Report, DUSA states that seepage from the tailings impoundments would be indicated by rising concentrations of chloride, sulfate, fluoride, and uranium. URS agrees with this because: 1) these constituents are abundant in tailings wastewater (see Table 15 of the Revised Background Report), and 2) these constituents are relatively mobile and conservative in the groundwater environment. In contrast, many other constituents are either not present in relatively high concentrations in tailings wastewater and/or are reactive in the subsurface environment. URS recommends that for the four conservative constituents listed above, DUSA considers preparing and including time-concentration plots in the groundwater monitoring reports. Increasing trends could provide early indication of seepage even before GWCLs are exceeded. Also, to provide confirmation that seepage has or has not occurred, DUSA might consider analyzing groundwater, tailings wastewater, and wildlife pond water for isotopic uranium. If significant differences exist in the ratio of U-234 to U-238 between these waters, isotopic uranium analyses may provide another tool for determining whether GWCL exceedances are related to impacts from the impoundments.

10. With regards to special consideration for well MW-26 (Section 13.3.4 of the Revised Background Report), URS believes that given the location of MW-26, along the eastern edge of Tailings Cell 2, it should be retained as an impoundment monitoring well. GWCLs were established and presented in the "Flow Sheet GWCL" column of Table 16 of the Revised Background Report; these values should be used as the groundwater discharge permit GWCLs for well MW-26 (with the error shown in attached Table 1 corrected and the exceptions discussed in item 6 above). However, URS agrees with DUSA, that exceedences of GWCLs at MW-26 should be interpreted in the context of its use as a pumping well for the chloroform plume remediation.

11. DUSA proposes that the groundwater at wells MW-18 and MW-19 be reclassified as Class III water (Section 13.3.1 of the Revised Background Report). The GWCLs proposed in Table 16 of the Revised Background Report assume that this reclassification has occurred. If the Division does not approve reclassification of groundwater at wells MW-18 and MW-

19, defers reclassification, or reclassifies groundwater at other wells, then the proposed GWCLs based on the fraction of the GWQS for these wells need to be revised in Table 16.

12. In Section 13.3.1 of the Revised Background Report, DUSA also notes that consideration should be given to reclassifying groundwater at wells MW-1 and MW-5 because the proposed GWCLs for cadmium and lead in MW-1 and cadmium in MW-5 exceed the GWQS. However, when the GWCLs are corrected as shown in Table 1, none of the proposed GWCLs for wells MW-1 and MW-5 exceeds respective GWQSs. Therefore, reclassification is not necessary.

In summary, with the exception of the errors that will require correction, DUSA established GWCLs in accordance with the methodology given in the conditionally approved flowchart. This methodology was developed in accordance with EPA guidance, and it takes into account that much, if not the majority, of background data consists of non-detected results. After correcting errors and revising the GWCLs for cadmium and tetrahydrofuran, 16 proposed GWCLs still exceed the corresponding GWQSs (Table 3). Despite exceeding GWQSs, it appears that these proposed GWCLs were established in accordance with the conditionally approved flowchart (with a few exceptions). As such, URS recommends that the Division approves these 16 proposed GWCLs (with exceptions corrected), because there is no physical or chemical basis for a background concentration to be limited to the GWQS. Even in approving these proposed GWCLs, several upward-trending data sets may require additional attention during future monitoring events.

REFERENCES

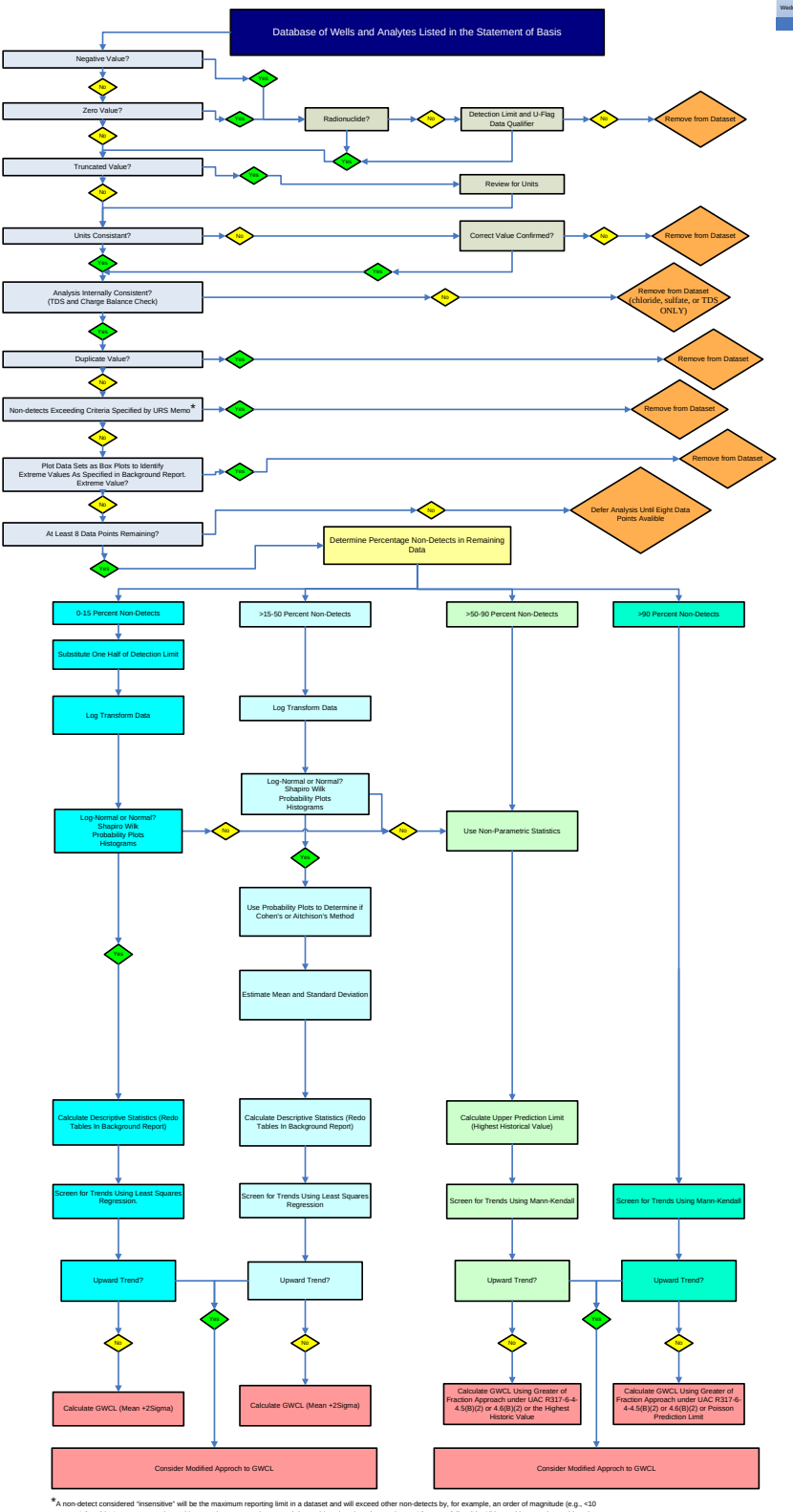
Utah Department of Environmental Quality (UDEQ), Division of Radiation Control (DRC) 2007a. *Completeness Review, DRC Findings, and Confirmatory Action Letter*. Letter from D.L. Finerfrock (DRC) to D. Frydenlund (DUSA). August 10, 2007.

Utah Department of Environmental Quality (UDEQ), Division of Radiation Control (DRC) 2007b. *DUSA Decision Tree/Flow Chart for Statistical Analysis for Background Groundwater Quality: Conditional Approval.* Letter from D.L. Finerfrock (DRC) to D. Frydenlund (DUSA). August 24, 2007.

Denison Mines (DUSA) Corporation 2007. *Revised Background Groundwater Quality Report: Existing Wells.* Prepared for Denison Mines (USA) Corporation, Denver, CO. October, 2007.

Groundwater Data Preparation and Statistical Process Flow for Calculating Groundwater Protection Standards, White Mesa Mill Site, San Juan County, Utah

Wednesday, April 16, 2008



*A non-detect considered "insensitive" will be the maximum reporting limit in a dataset and will exceed other non-detects by, for example, an order of magnitude (e.g., <10 versus <1.0 µg/L). In some cases, insensitive non-detects may also exceed detectable values in a dataset (e.g., <10 versus 3.5 µg/L). All insensitive non-detectable values will be removed regardless of relation to GWQS.

Figure 19
Groundwater Data Preparation and Statistical Process Flow for Calculating Ground Water Compliance Limits, White Mesa Mill Site, San Juan County, Utah.

Table 1 - Revisions to Proposed GWCLs

Well	Parameter	GWQS	Percentage Detects	DUSA Proposed GWCL	DRC Revised GWCL	Comment
MW-1	Cadmium	5 ug/L	31.6%	13 ug/L	4.2 ug/L*	The proposed GWCL included early data that is suspect because of the extreme concentration range observed within a short time period. All data prior to March 1982 was removed from the data set. Of the remaining data, 10.6% are detects; therefore, the GWCL should be the highest historical value or the fraction of the GWQS, whichever is greater. The GWCL should be 4.2 ug/L (highest historical value).
MW-1	Lead	15 ug/L	4.2%	20 ug/L	5.59 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the greater of the Poisson limit or the fraction of the standard, which is 5.59 ug/L (Poisson limit).
MW-1	Tetrahydrofuran	46 ug/L	81.8%	94.41 ug/L	11.5 ug/L	This GWCL is proposed based on the Cohen's mean plus 2 σ. However, because tetrahydrofuran is not a naturally occurring constituent, background should be set at the fraction of the GWQS.
MW-1	Xylenes	10,000 ug/L	0.0%	2.5 ug/L	2,500 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 2,500 ug/L instead of 2.5 ug/L.
MW-2	Cadmium	5 ug/L	40.5%	17 ug/L	2.5 ug/L*	The proposed GWCL included early data that is suspect because of the extreme concentration range observed within a short time period. All data prior to March 1982 was removed from the data set. Of the remaining data, 10.6% are detects; therefore, the GWCL should be the highest historical value or the fraction of the GWQS, whichever is greater. The GWCL should be 2.5 ug/L (fraction of GWQS).
MW-2	Cobalt	730 ug/L	0.0%	362 ug/L	365 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 365 ug/L instead of 362 ug/L.
MW-2	Lead	15 ug/L	9.5%	20 ug/L	7.5 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the greater of the Poisson limit or the fraction of the standard, which is 7.5 ug/L (fraction of standard).
MW-2	Selenium	50 ug/L	66.7%	25 ug/L	26.6 ug/L	This GWCL is proposed based on the fraction of the groundwater standard. According to the flowchart, it should be Cohen's mean plus two standard deviations - 26.6 ug/L.
MW-2	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-3	Cadmium	5 ug/L	66.7%	20 ug/L	4.67 ug/L*	The proposed GWCL included early data that is suspect because of the extreme concentration range observed within a short time period. All data prior to March 1982 was removed from the data set. Of the remaining data, 52.4% are detects; therefore, the data set was tested for normality, and normality could not be rejected and the GWCL should be Cohen's mean plus 2 σ. The GWCL should be 4.67 ug/L.
MW-3	Cobalt	730 ug/L	0.0%	362 ug/L	365 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 365 ug/L instead of 362 ug/L.
MW-3	Lead	15 ug/L	8.7%	20 ug/L	7.5 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the greater of the Poisson limit or the fraction of the standard, which is 7.5 ug/L (fraction of standard).
MW-3	Tetrahydrofuran	46 ug/L	85.7%	123.55 ug/L	23 ug/L	This GWCL is proposed based on the mean plus 2 σ. However, because tetrahydrofuran is not a naturally occurring constituent, background should be set at the fraction of the GWQS.
MW-3	Uranium	30 ug/L	98.7%	67.16 ug/L	47.32 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the mean plus two standard deviations - 47.32 ug/L.
MW-3	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-5	Cadmium	5 ug/L	40.0%	20 ug/L	2.0 ug/L*	The proposed GWCL included early data that is suspect because of the extreme concentration range observed within a short time period. All data prior to March 1982 was removed from the data set. Of the remaining data, 4.2% are detects; therefore, the GWCL should be the Poisson limit or the fraction of the GWQS, whichever is greater. The GWCL should be 2.0 ug/L (Poisson limit).
MW-5	Nitrate/ite	10 mg/L	50.0%	0.3 mg/L	2.5 mg/L	This GWCL is proposed based on the highest historical value, but according to the flowchart, the fraction of the groundwater standard can be used because it is higher - 2.5 mg/L.
MW-5	Lead	15 ug/L	5.3%	10 ug/L	4.1 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the greater of the Poisson limit or the fraction of the standard, which is 4.1 ug/L (Poisson limit).
MW-5	Mercury	2 ug/L	3.1%	0.5 ug/L	1 ug/L	This GWCL is proposed based on the fraction of the groundwater standard, but according to the flowchart, the Poisson limit can be used because it is higher - 1 ug/L.
MW-5	Fluoride	4 mg/L	100.0%	1.68 mg/L	1.42 mg/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the mean plus two standard deviations - 1.42 ug/L.

Table 1 - Revisions to Proposed GWCLs

Well	Parameter	GWQS	Percentage Detects	DUSA Proposed GWCL	DRC Revised GWCL	Comment
MW-5	Tetrahydrofuran	46 ug/L	57.1%	22.03 ug/L	11.5 ug/L	This GWCL is proposed based on the Cohen's mean plus 2 σ and correctly follows the flowchart. However, because tetrahydrofuran is not a naturally occurring constituent, the GWCL should be set at the fraction of the GWQS.
MW-5	Xylenes	10,000 ug/L	0.0%	2.5 ug/L	2,500 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 2,500 ug/L instead of 2.5 ug/L.
MW-11	Beryllium	4 ug/L	5.3%	2 ug/L	1 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the greater of the Poisson limit or the fraction of the standard, both of which are 1 ug/L.
MW-11	Manganese	800 ug/L	100.0%	200 ug/L	131.29 ug/L	This GWCL is proposed based on the fraction of the groundwater standard. According to the flowchart, it should be the mean plus two standard deviations - 131.29 ug/L.
MW-11	Nickel	100 ug/L	4.4%	50 ug/L	46.2 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the greater of the Poisson limit or the fraction of the standard, which is 46.2 ug/L (Poisson limit).
MW-11	Xylenes	10,000 ug/L	0.0%	2.5 ug/L	2,500 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 2,500 ug/L instead of 2.5 ug/L.
MW-12	Cobalt	730 ug/L	0.0%	362 ug/L	365 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 365 ug/L instead of 362 ug/L.
MW-12	Nitrate/ite	10 mg/L	14.3%	0.12 mg/L	5 mg/L	Use the fraction of the groundwater standard (5 mg/L) until there are at least 8 data points for analysis.
MW-12	Mercury	2 ug/L	7.1%	3 ug/L	1 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the greater of the Poisson limit or the fraction of the standard, which is 1 ug/L (fraction of standard).
MW-12	Tetrahydrofuran	46 ug/L	75.0%	42.18 ug/L	23 ug/L	This GWCL is proposed based on the Cohen's mean plus 2 σ and correctly follows the flowchart. However, because tetrahydrofuran is not a naturally occurring constituent, the GWCL should be set at the fraction of the GWQS.
MW-12	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-14	Cobalt	730 ug/L	0.0%	362 ug/L	365 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 365 ug/L instead of 362 ug/L.
MW-14	Zinc	5000 ug/L	71.4%	2500 ug/L	35.04 ug/L	This GWCL is proposed based on the fraction of the groundwater standard, but according to the flowchart, it should be Cohen's mean plus two standard deviations - 35.04 ug/L.
MW-14	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-15	Ammonia	25 mg/L	76.9%	12.5 mg/L	0.21 mg/L	This GWCL is proposed based on the fraction of the groundwater standard, but according to the flowchart, it should be Cohen's mean plus two standard deviations - 0.21 mg/L.
MW-15	Cobalt	730 ug/L	0.0%	362 ug/L	365 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 365 ug/L instead of 362 ug/L.
MW-15	Iron	11000 ug/L	50.0%	5500 ug/L	81.7 ug/L	This GWCL is proposed based on the fraction of the groundwater standard, but according to the flowchart, it should be Cohen's mean plus two standard deviations - 81.7 ug/L.
MW-15	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-17	Cobalt	730 ug/L	0.0%	362 ug/L	365 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 365 ug/L instead of 362 ug/L.
MW-17	Nitrate/ite	10 mg/L	14.3%	0.1 mg/L	5 mg/L	Use the fraction of the groundwater standard (5 mg/L) until there are at least 8 data points for analysis.
MW-17	Uranium	30 ug/L	100.0%	46.8 ug/L	46.66 ug/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the mean plus two standard deviations - 46.66 ug/L.
MW-17	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-18	Sulfate	NA	100.0%	1940 mg/L	1938.9 mg/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the mean plus two standard deviations - 1938.9 mg/L.

Table 1 - Revisions to Proposed GWCLs

Well	Parameter	GWQS	Percentage Detects	DUSA Proposed GWCL	DRC Revised GWCL	Comment
MW-18	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-19	Ammonia	25 mg/L	60.0%	12.5 mg/L	0.31 mg/L	This GWCL is proposed based on the fraction of the groundwater standard, but according to the flowchart, it should be Cohen's mean plus two standard deviations - 0.31 mg/L.
MW-19	Fluoride	4 mg/L	100.0%	1.4 mg/L	1.39 mg/L	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the mean plus two standard deviations - 1.39 mg/L.
MW-19	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-26	Benzene	5 ug/L	3.8%	4.75 ug/L **	2.5 ug/L	The "flow sheet" GWCL is based on the Poisson Limit and correctly follows the flowchart. However, because benzene is not a naturally occurring constituent, the compliance limit should be set at the fraction of the GWQS.
MW-26	Carbon Tetrachloride	5 ug/L	3.8%	4.75 ug/L **	5 ug/L	The "flow sheet" GWCL is based on the Poisson Limit and correctly follows the flowchart. However, because carbon tetrachloride is a trace co-contaminant of the chloroform plume, in accordance with UAC R317-6-6.15.F, the compliance limit should be set at the GWQS.
MW-26	Chloromethane	30 ug/L	30.8%	6.6 ug/L **	30 ug/L	The "flow sheet" GWCL is the highest historical value and correctly follows the flowchart. However, because chloromethane is a degradation product of chloroform, in accordance with UAC R317-6-6.15.F, the compliance limit should be set at the GWQS.
MW-26	Cobalt	730 ug/L	0.0%	362 ug/L **	365 ug/L	The "flow sheet" GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 365 ug/L instead of 362 ug/L.
MW-26	Nitrate/ite	10 mg/L	70.0%	0.623 mg/L **	0.623 mg/L	The "flow sheet" GWCL is the correct value; however, the comment in incorrect. The comment states that the proposed GWCL is the fraction of the GWQS, but the proposed GWCL is actually Cohen's mean plus two standard deviations - 0.623 mg/L.
MW-26	Xylenes	10,000 ug/L	0.0%	5 ug/L **	5,000 ug/L	The "flow sheet" GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.
MW-32	Nitrate/ite	10 mg/L	10.0%	0.1 mg/L	5 mg/L	This GWCL is proposed based on the highest historical value, but according to the flowchart, the fraction of the groundwater standard can be used because it is higher - 5 mg/L.
MW-32	Xylenes	10,000 ug/L	0.0%	5 ug/L	5,000 ug/L	The proposed GWCL is based on the fraction of the GWQS and follows the flowchart correctly; however, the proposed GWCL contains a typographical error. The fraction of the GWQS should be 5,000 ug/L instead of 5 ug/L.

* These revised GWCLs were calculated by URS and should be verified by DUSA.

** For MW-26, DUSA does not propose GWCLs. The GWCL is from the "Flow Sheet GWCL" column of Table 16 of the Revised Background Report (see item 10 of the URS Completeness Review).

Table 2 - Groundwater Compliance Limits Categorized According to Statistical Flow Process

Parameter Categorized	Less Than 50% Non-Detects		>50% to 90% Non-Detects or Non-Parametric Data Sets		>90% Non-Detects		Total
	Mean + 2 Sigma*	Fraction of GWQS**	Highest Historic Value	Fraction of GWQS	Poisson Limit	Fraction of GWQS	
Number of GWCLs Established by Approach	81	4	50	93	10	256	494
Percentage of GWCLs Established by Approach	16.4%	0.8%	10.1%	18.8%	2.0%	51.8%	100%
Number of GWCLs Exceeding GWQS by Approach	12	NA	4	NA	0	NA	16
Percentage of GWCLs Exceeding GWQS by Approach	2.4%	NA	0.8%	NA	0.0%	NA	3.2%

Breakdown of GWCLs by approach assumes that the proposed GWCLs that deviate from the approved flowchart have been corrected and that GWCLs for Cadmium in MW-1, MW-2, MW-3, and MW-5 and for THF in MW-1, MW-3, MW-5, and MW-12 have been revised to the DRC recommended GWCL

* Mean + 2 Sigma includes the arithmetic mean for data sets with 15% or less non-detects and the Cohen's mean for data sets with >15% to 50% non-detects

** The GWCL for THF in MW-1, MW-3, MW-5, and MW-12 has been revised to the fraction of the GWQS because THF is not a naturally occurring constituent.

NA = not applicable

Table 3 - Proposed GWCLs That Exceed GWQSs

Well	Parameter	DUSA Proposed GWCL (ug/L)	Proposed GWCL Based on	GWQS (ug/L)	Error in DUSA Proposed GWCL? (from Table 1)	DRC Proposed GWCL (ug/l)
MW-1	None	----	----	----	----	----
MW-2	None	----	----	----	----	----
MW-3	Manganese	4,233.03	Normal Mean + 2σ	800	No	4,233.0
MW-3	Uranium	67.16	Non-parametric Highest Historical Value*	30	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the mean plus two standard deviations - 47.32 ug/L.	47.32
MW-5	None	----	----	----	----	----
MW-11	None	----	----	----	----	----
MW-12	Cadmium	7	Non-parametric Highest Historical Value	5	No	7
MW-12	Manganese	2,088.80	Log Normal Mean + 2σ	800	No	2,088.8
MW-14	Manganese	2,230.30	Normal Mean + 2σ	800	No	2,230.3
MW-14	Uranium	98	Non-parametric Highest Historical Value	ug/L	No	98.0
MW-15	Selenium	128.72	Normal Cohen's Mean + 2σ	50	No	128.7
MW-15	Uranium	65.67	Non-parametric Highest Historical Value	30	No	65.7
MW-17	Manganese	915.39	Log Normal Mean + 2σ	800	No	915.4
MW-17	Uranium	46.8	Non-parametric Highest Historical Value*	30	This GWCL is proposed based on the highest historical value. According to the flowchart, it should be the mean plus two standard deviations - 46.66 ug/L.	46.66
MW-18	Uranium	55.1	Normal Mean + 2σ	30	No	55.1

Table 3 - Proposed GWCLs That Exceed GWQSs

Well	Parameter	DUSA Proposed GWCL (ug/L)	Proposed GWCL Based on	GWQS (ug/L)	Error in DUSA Proposed GWCL? (from Table 1)	DRC Proposed GWCL (ug/l)
MW-19	Thallium	2.15	Normal Cohen's Mean + 2σ	2	No	2.1
MW-26	Manganese	1,610	Non-parametric Highest Historical Value	800	No	1,610.0
MW-26	Uranium	41.85	Log Normal Mean + 2σ	30	No	41.8
MW-32	Iron	14,060	Normal Mean + 2σ	11,000	No	14,060
MW-32	Manganese	5,594.95	Normal Mean + 2σ	800	No	5,594.9

* Method is not correct according to Figure 19 flowchart. DRC proposed GWCL assumes correct method is used.