WORK PLAN
December 13, 2011

Prepared for:
Rio Algom Mining LLC

Supplemental Site Assessment to Address Out-of-Compliance Status at Trend Wells RL-1 and EF-8

Lisbon Facility

Prepared by:

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SUPPLEMENTAL SITE ASSESSMENT TO ADDRESS OUT-OF-COMPLIANCE STATUS AT TREND WELLS RL-1 AND EF-8 LISBON FACILITY, RIO ALGOM MINING LLC

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SUPPLEMENTAL SITE ASSESSMENT TO ADDRESS OUT-OF-COMPLIANCE STATUS AT TREND WELLS RL-1 AND EF-8 LISBON FACILITY, RIO ALGOM MINING LLC

1.0 INTRODUCTION

Montgomery & Associates (M&A) has prepared this work plan on behalf of Rio Algom Mining LLC (RAML) for a supplemental site assessment (SSA) to the address out-of-compliance (OOC) status at Trend Wells RL-1 and EF-8 at the Lisbon Facility located near La Sal, Utah (Site). **Figure 1** shows the current site features. Trend wells RL-1 and EF-8 are out of compliance because uranium concentrations have exceeded Target Action Levels for two consecutive sampling events, as shown on **Figures 2 and 3**. Uranium mining and milling occurred at the Site from 1972 to 1989. Two tailings impoundments were operated during mining. Seepage of tailings water from the impoundments was the source of uranium contamination in the groundwater. The tailings impoundments were covered with impervious material in the mid 2000s.

Groundwater monitoring is currently conducted at the Site in accordance the 2004 Long Term Groundwater Monitor Plan (LTGMP) (Komex, 2004), which was prepared in association with the 2001 Application for Alternate Concentration Limits (ACLs) and response for further information document (Lewis Water Consultants, 2001; Komex, 2003). Groundwater monitoring activities are currently conducted in accordance with Section 53 of

Radioactive Materials License UT 1900481 (License) issued by the Utah Division of Radiation Control (UDRC) in January 2010. The primary constituent of concern (COC) in groundwater at the Site is uranium. Other COCs include molybdenum, selenium, and arsenic. Total dissolved solids, chloride, sulfate, bicarbonate, and groundwater elevation are also monitored at the Site. The work plan activities primarily address uranium in groundwater; however, they will also further characterize the nature and extent of the secondary COCs.

In the February 7, 2011 letter to RAML, UDRC requested that RAML contract with an independent consultant to address the out of compliance status at Trend Well RL-1 (UDRC, 2011). Specifically, UDRC requested the following actions: (1) review pertinent information and documents, including the existing Alternate Concentration Limit (ACL) model, relevant laboratory data, the LTGMP and (2) provide potential additional groundwater modeling, as appropriate. In the letter, UDRC requested that RAML prepare an Action Plan to address the following performance objectives (POs):

- PO #1 – Justify whether the current RL-1 data set is or is not sufficient to depict the Uranium concentration trend;
- PO #2 – Conclude with definitive evidence whether the Lisbon Valley Facility is operating within or outside of the analyzed condition of the Nuclear Regulatory Commission (NRC) approved "Application for Alternate Concentration Limits" (Approved May 11, 2004), and LTGMP, and;
- PO #3 – Determine whether the ACL model should be revisited/revised to account for more recent data.

The Action Plan was prepared by M&A on behalf of RAML and submitted to UDRC on June 1, 2011 (M&A, 2011a). In accordance with the Action Plan, M&A conducted an evaluation of hydrogeologic conditions, groundwater quality, and the ACL groundwater model. A technical memorandum summarizing the evaluation was submitted to UDRC on August 10, 2011 (M&A, 2011b). As discussed in the memorandum, M&A recommended that additional work be conducted at the Site before final conclusions could be reached on the POs. On October 13, 2011, representatives from RAML, M&A, and UDRC met to discuss the results of the evaluation and a plan to address compliance conditions at the Site. During the meeting, conceptual aspects of the SSA were discussed and RAML agreed to submit this work plan for the SSA by December 16, 2011.

2.0 SUMMARY OF SITE CONDITIONS

Previous investigations, data analyses, and modeling have resulted in a substantial amount of information about the site. Many Site features and conditions are well understood as a result of this work. The previous work served as the basis for developing the current ACLs. However, much of the previous work was conducted during dynamic groundwater conditions caused by mine operations and Corrective Action Program (CAP) pumping. These dynamic groundwater conditions complicated characterization efforts and modeling of groundwater flow and uranium transport. Since the CAP ceased in 2004, groundwater conditions have been recovering towards ambient condition. The nature of groundwater recovery after 2004 has resulted in new data and information that indicates that the hydrogeologic conceptual model at the Site needs to be refined. Data obtained after 2004 are more limited than before 2004, which results in uncertainties that limit our ability to refine the conceptual model sufficiently to conduct additional modeling for evaluation of compliance conditions at the Site.

The sections below summarize the key uncertainties that were identified during evaluation of geologic, hydrogeologic, groundwater, and uranium concentration conditions at the Site.

2.1 GEOLOGY

The primary geologic formations at the Site are the Burro Canyon Formation and the Brushy Basin Member of the Morrison Formation. Groundwater at the site is first encountered in the Burro Canyon Formation. The Burro Canyon Formation is predominantly fine grained sandstone with interbedded silt and mudstones. Burro Canyon Formation has primary porosity and secondary fracture porosity (Earthfax, 1989). Underlying the Burro Canyon Formation is the 400 foot thick Brushy Basin Member of the Morrison Formation.

The Brushy Basin Member is predominantly composed of bentonitic claystone with lenses of fine grained sandstone and mudstone (Earthfax, 1989).

The geologic setting of the Site has two important features that control groundwater flow and uranium transport: (1) the Lisbon Valley Anticline (LVA) and (2) the Lisbon Fault (LF). The axis of the LVA runs from southeast to northwest through the site and passes directly under the lower tailings impoundment. The southeastern and northwestern extents of the LVA have not been characterized. The LF, located along the southwestern boundary of the Site, is a high angle reverse fault with approximately 2,200 feet of vertical displacement and strikes southeast to northwest.

2.2 HYDROGEOLOGY

The primary aquifer at the Site is the Burro Canyon Aquifer (BCA). The BCA is currently unsaturated along the crest of the LVA and beneath most of the upper and lower tailings impoundments. This unsaturated zone separates the BCA into two separate aquifer areas: the North Aquifer and the South Aquifer. The South Aquifer is bounded on the southwest by the LF and on the northeast by the unsaturated zone of the BCA.

Horizontal hydraulic conductivity of the BCA was characterized by slug tests and pumping tests (Lewis Water Consultants, 2001). BCA hydraulic conductivity is variable due to varying degrees of fracturing. Within the South Aquifer, hydraulic conductivities tend to be higher than in the North Aquifer. Previous reports have identified three populations of horizontal hydraulic conductivity in the BCA: (1) unfractured rock (average conductivity of 0.2 feet per day [ft/d]), (2) fractured rock (average conductivity of 6 ft/d), and (3) extensively fractured rock (south aquifer only; 100 ft/d) (Lewis Water Consultants, 2001). The vertical hydraulic conductivity of the BCA has not been estimated by field testing. Horizontal groundwater velocities may vary from a few feet per year (ft/y) in unfractured rock (primarily North Aquifer) to over 100 ft/y for extensively fractured rock (Lewis Water Consultants, 2001).

Due to the limited record of the methods and analyses of previously conducted pumping and slug tests, combined with highly variable horizontal hydraulic conductivity estimates, representative values for horizontal and vertical hydraulic conductivity for the BCA are uncertain. Additional testing is needed to develop better estimates of the horizontal and vertical hydraulic conductivity for the BCA. Better estimates of the BCA hydraulic conductivities will enable better estimation of the rate of groundwater flow and uranium transport.

The Brushy Basin Aquitard (BBA) underlies the BCA. Limited characterization of the horizontal and vertical hydraulic conductivity of the BBA has been conducted to date; therefore, the BBA hydraulic conductivity is uncertain. A representative horizontal hydraulic conductivity value for the BBA on the order of 0.01 ft/d has been reported (Lewis Water Consultant, 2001). Additional testing is needed to develop better estimates of the horizontal and vertical hydraulic conductivity for the BBA. Better estimates of the BBA hydraulic conductivities will improve understanding of the rate of groundwater flow and uranium transport from the BCA to the BBA.

2.3 GROUNDWATER FLOW

Figure 4 shows a groundwater contour map inferred from the 2010 groundwater elevation data. The current direction of groundwater flow at the Site is generally from southeast to northwest. Groundwater pumping during the CAP occurred in the North and South Aquifers from approximately 1990 to 2004 (Lewis Water Consultants, 2001). Historic hydraulic gradients and groundwater flow directions during mining and subsequent CAP differed from current gradients and flow directions due to mounds created by seepage from the tailings impoundments and Bisco Lake. Current groundwater flow directions are complicated by the anticline, fractures in the BCA, and residual water level rebound from the CAP.

The following aspects of the groundwater flow conditions are uncertain and may require further characterization.

- **North Aquifer –** due to the limited number of monitor wells remaining at the Site after 2004, the state of water level recovery in the North Aquifer between OW-UT-9 and RL-1 is unknown, thus the current local direction and rate of horizontal and vertical groundwater flow in this area are unknown. Additional monitor wells and testing are needed in this area to resolve these uncertainties.
- **South Aquifer –** groundwater levels in South Aquifer wells EF-3A and EF-8 are still recovering from CAP pumping, as shown on **Figure 3 and Figure 5**. The long-term groundwater recovery in the South Aquifer may indicate that limited recharge occurs in this area. Additional characterization and data analysis may be required to further evaluate the cause of the slow groundwater recovery.

  EF-3A and EF-8 are screened immediately above the contact between the BCA and BBA. Current groundwater levels in these wells are approximately 35 to 87 feet above the tops of the well screens. Rationale for the design of these wells is not available. Based on the available information and data, it is unclear whether groundwater occurs under confined or unconfined conditions in the area near these wells. In addition, the affect of fractures in the South Aquifer on groundwater conditions is not fully understood. Additional monitor wells are needed in the South Aquifer to address this uncertainty.
- **Lisbon Valley Anticline –** because of uncertainties in the nature of the LVA northwest of the Site, groundwater flow directions near the northwestern extent of the LVA (near the Long-Term Surveillance and Monitoring [LTSM] boundary) are also uncertain (**Figure 4)**. Groundwater flow in this area could continue to the northwest or change to a more westerly direction. Additional monitor wells

and testing in this area is needed to resolve this uncertainty. This area is especially important for projecting the near-term impact of uranium in groundwater at the Site.

- **Tailings Source Area –** the shape and extent of the unsaturated zone in the BCA near the tailings impoundments has changed over the years due to changes in the tailings seepage rate and groundwater pumping during the CAP. The historic and current groundwater flow regime beneath the tailings in the BCA and BBA are not well understood. Additional characterization may be needed near the tailings to improve understanding of the groundwater flow regime in this area, which is important characterizing the tailing source area for modeling.

2.4 URANIUM CONCENTRATIONS

A map depicting 2011 uranium concentration contours is presented on **Figure 6**. The concentration contours are dashed to indicate areas of uncertainty. The contours represent our current understanding of the uranium plume in the BCA. However, historic data from abandoned monitor wells indicate that uranium concentrations in both the North and South Aquifers were higher than current concentrations and reached 180 milligrams per liter near the tailings. Therefore, it is likely that higher uranium concentration still exist in parts of BCA.

Seepage from the upper and lower tailings impoundments is understood to be the primary source of uranium in groundwater. Groundwater levels near the tailings impoundments fluctuated due to mounds created by seepage and dewatering created by the CAP pumping. These fluctuations in groundwater levels may have left residual uranium in the unsaturated zone beneath and near the tailings impoundments. Groundwater level recovery near the tailings impoundments could dissolve residual uranium back into the groundwater system, where it can migrate and prolong the uranium source.

The potential additional characterization activities needed to resolve uncertainties in the groundwater flow conditions will also resolve uncertainties in the nature, distribution, and source of uranium in groundwater.

3.0 SUPPLEMENTAL SITE ASSESSMENT TASKS

This section presents an overview of the proposed approach to the SSA and outlines the tasks and activities that comprise the work to be conducted.

3.1 OVERVIEW AND SCHEDULE OF PROPOSED APPROACH

The primary objective of the SSA is to conduct meaningful investigative activities to resolve the uncertainties discussed above. To achieve this objective in an efficient, effective, and economical manner, M&A recommends an outcome-oriented approach to the SSA. The outcome-oriented approach uses a two-phase probabilistic groundwater modeling process to identify critical parameters and areas of uncertainty that drive analysis of compliance, and to develop robust model projections. The results of first phase of modeling, conducted before the final field plan is formalized, will enable selection of appropriate data to be collected during the field investigation. Appropriate data are only those data that address meaningful uncertainty, improve our understanding of site conditions, and that are required to assess site compliance. The results of the field investigation and subsequent data analysis are used to refine the groundwater model and reduce model uncertainty. The refined model is then used to develop robust model projections to assess compliance issues.

The outcome-oriented approach differs from a traditional project approach in that it incorporates the inherent uncertainty in site conditions into the modeling process, which will enable development of an informed and economical field program, reduce the likelihood of a multi-phase field program, and result in projection of more robust ACLs.

The work plan includes the following six tasks:

- Task 1 – Conduct Phase 1 Groundwater Modeling
- Task 2 – Prepare Final Work Plan

- Task 3 – Conduct Field Program
- Task 4 – Evaluate Field Data
- Task 5 – Conduct Phase 2 Groundwater Modeling
- Task 6 – Prepare Report

A preliminary schedule for each task, meetings, and milestones is shown in **Figure 7**. Descriptions of each task are provided below.

3.1.1 Task 1 – Conduct Phase 1 Groundwater Modeling

Important uncertainties still exist at the Site that limit our ability to adequately model uranium fate and transport at the Site. Some of these uncertainties relate to the sparse nature of data available over the last 7 years, while other uncertainties relate to insufficient understanding of contaminant sources and hydrogeologic structures, properties, and conditions. Given this uncertainty, a single deterministic model of the Site is unlikely to accurately represent the groundwater system and result in robust projections of future system behavior. For this reason, we recommend using probabilistic modeling methods that considers numerous possible models and will result in a robust projection of future system behavior. The results of the Phase 1 modeling will be used to formalize the final field program.

The Phase 1 modeling will be designed to determine which uncertainties have the most control over outcomes of concern. To facilitate the modeling process, quantitative outcomes of concern will be developed (e.g., a concentration at a sentinel well that cannot be exceeded within a specified period of time). A numerical groundwater flow and transport model will be used to conduct the probabilistic modeling. Groundwater flow and transport will be simulated for the period between 2004-2212. Ranges of groundwater flow and uranium transport parameter values will be selected for key uncertainties. Previously conducted work, relevant scientific literature, and our experience will serve as the basis for determining appropriate parameter ranges for the Phase 1 modeling. The model will be run one time for each possible combination of parameters from the set. As many as 5,000 model simulations may be conducted during the Phase 1 modeling.

Each model will be given a weight so that models that are both “likely” and “important” will be most influential in choosing where and what type of data to collect in the field. Models that are “likely” are simulations that show a good fit between projected and measured groundwater levels and uranium concentrations during the period 2004-2011 at currently monitored wells. If a model is considered likely, it will be given a high likelihood weight (close to 1); however, if a model is not considered likely, it will be given a low likelihood weight (closer to 0). Similar to the likelihood weighting, models that are “important” are simulations that results in an outcome of concern. If a model results in an outcome of concern, it will have a high importance weight; however, if a model indicates that an outcome of concern is not likely, it will have a low importance weight.

Likelihood-importance weighted variance between model predictions will then be calculated for each model cell and a map of likelihood-importance weighted variance will be created. Areas where variance is low are areas that are not valuable for data collection. Areas where variance is high are valuable for data collection.

Task 1 will be completed by the end of February 2012.

3.1.2 Task 2 – Prepare Final Work Plan

M&A will prepare a final work plan to address UDRC comments on the initial work plan, summarize the Phase 1 modeling results, and present the final field program. The work plan will include a map show proposed monitor well locations where additional groundwater level, uranium concentration, and aquifer property data will be obtained. In addition, M&A will provide specifications for well drilling, construction, development, and testing.

The final work plan will be submitted to UDRC in by the end of March 2012. At that time, a meeting with UDRC will be requested to review the final work plan and expedite UDRC final approval.

3.1.3 Task 3 – Conduct Field Program

The goal of the field program is develop data to reduce key uncertainties about the Site. As described in **Task 1**, the Phase 1 modeling will be used to identify the data that will best reduce key uncertainties. Key uncertainties that may be tested in the field program include:

- Hydraulic conductivity of the BCA and BBA
- Initial distribution of uranium mass within the BCA
- Characteristics of tailings source area
- Nature of groundwater boundaries at the Site
- Nature and extent of the LVA

Our preliminary plan for field activities includes the following components:

- **Geophysical Surveys –** A preliminary resistivity survey will be conducted at the site prior to selection of proposed new monitor well locations. The preliminary survey will be conducted along a transect that passes through several existing wells, and through portions of the BCA believed to be unsaturated. Results from the initial survey will be evaluated to determine resistivity contrasts between the BCA, BBA, and the water table. If sufficient resistivity contrast is observed to delineate groundwater conditions near the LVA, additional resistivity survey lines will be conducted while the geophysical crew is still in the field. Results will be used to determine the present extent of the unsaturated portion of the BCA.
- **Monitor Well Construction –** Results of the Phase 1 modeling, combined with the results of the geophysical surveys, will be used to select the number and locations of new monitor wells. Based on current understanding of site

conditions, the SSA would likely include a minimum of 4 to 7 new monitor wells. The new monitor wells will be used to characterize the geology, measure groundwater elevations, estimate hydraulic gradients, characterize groundwater chemistry, and estimate hydraulic conductivity within the BCA and BBA. Well construction methodology would likely require cuttings and fluid containment and disposal. Use of conventional or reverse-circulation air drilling would allow detection of groundwater during drilling.

- **Hydraulic Testing –** all new monitor wells, and selected existing wells, would be tested to determine formation hydraulic conductivity. Testing methodology would depend on results of drilling, but would likely include slug tests, short-term pumping tests (if possible), and laboratory analyses. Short-term constant rate pumping tests with observation wells provide the best estimate of hydraulic conductivity. If possible, M&A would conduct such tests on clean wells if approval is obtained from UDRC to discharge the extracted groundwater without treatment.
- **Monitoring –** all new wells would be sampled immediately after development and quarterly for at least 1 year. UDRC has requested information regarding the adequacy of low-flow sampling at the Site. During evaluation of site conditions, M&A conducted a field audit of the low-flow sampling procedures at the Site. Based on this audit, the field sampling protocols followed standard low-flow procedures (U.S. Environmental Protection Agency, 1996). In particular, the water level and field chemistry parameters were stabilized prior to collecting samples. In this case, the samples are considered representative of groundwater conditions and not of well casing water. Based on the available information, M&A believes that the low-flow sampling methods are adequate for Site conditions. However, to respond to UDRC's request for more information, a comparative evaluation of different groundwater sampling methods will be conducted during the SSA. The evaluation will include sampling by purge, low-flow, and HydraSleeve methods. The results will be

used to evaluate differences in sampling methods and confirm that the low-flow sampling method is adequate for Site conditions.

Geophysical surveys could begin in January 2012 if contractor crews are available. The well construction and testing program is expected to commence in April 2012, would be completed in about 50 days, and is projected at this time to be completed by the end of May 2012. The actual length of the field program will depend on the extent of field work required to meet project objectives.

3.1.4 Task 4 – Evaluate Field Data

M&A will evaluate data obtained from the field program and prepare well logs and well construction schematics. **Task 4** would commence during the field program to the extent possible and is expected to take about 30 days to complete depending on the number of wells installed and hydraulic tests conducted. At this time, the **Task 4** is projected to be completed in mid-June 2012.

3.1.5 Task 5 – Conduct Phase 2 Groundwater Modeling

The probabilistic numerical flow and transport model developed in **Task 1** will be used to evaluate system behavior, determine appropriate remediation strategies, and reestablish compliance at the Site. Data collected during **Task 2** will be used to update the likelihoods of the ensemble of models developed in **Task 1.** These new data will reduce the weighted likelihood of physically unrealistic models. Model outputs will be used to evaluate the efficacy of the current remedial program and develop revised ACLs if appropriate. **Task 5** would commence during the latter stages of **Task 4,** is expected to take about 50 days to complete, and is projected to be completed by mid-August 2012.

3.1.6 Task 6 – Prepare Report

A final report will be prepared that summarizes methods and results from the field and modeling efforts as well as recommendations to address compliance conditions at the Site. **Task 6** will commence during **Task 5** and will take about 90 days to complete. At this time, the draft report is projected to be submitted to UDRC in mid-October 2012.

4.0 REFERENCES CITED

Earthfax Engineering, Inc. 1989. **Recommended Corrective-Action Plan for Control of Groundwater Contamination at the Lisbon Uranium Mill**: March 27, 1989.

Komex, 2003, **Response to Request for Additional Information (RAI), Application for Alternate Concentration Limits Source Materials License SUA -119, Rio Algom Mining LLC, Lisbon Facility, La Sal, Utah:** prepared for Rio Algom Mining LLC, October 13, 2003.

_____, 2004. **Long Term Groundwater Monitoring Plan, Application for Alternative Concentration Limits Source Materials License SUA-1119 RAMC Lisbon Facility La Sal, Utah,** February 19, 2004.

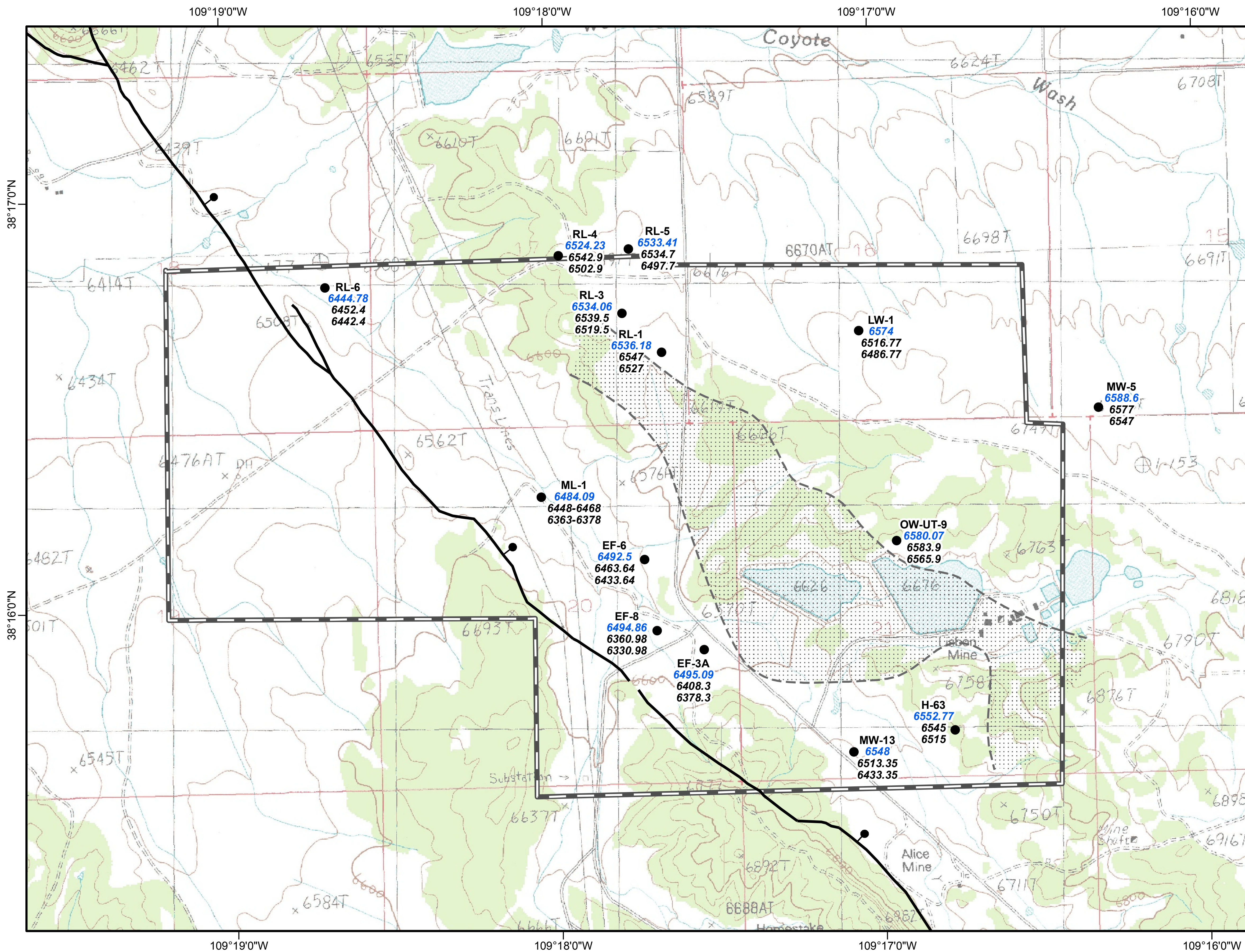
Lewis Water Consultants, Inc. 2001. **Application for Alternative Concentration Limits Source Materials License SUA-1119 RAMC Lisbon Facility La Sal, Utah:** March 1, 2001.

Montgomery & Associates, 2011a. **Action Plan to Address Out of Compliance Conditions at Target Action Level Well RL-1, Rio Algom Mining, LLC – Lisbon Operation**, June 1, 2011.

_____, 2011b. **Technical Evaluation of Lisbon Facility Groundwater Quality,** August 10, 2011.

U. S. Environmental Protection Agency, 1996, **Low-flow (Minimal Drawdown) Ground-water Sampling Procedures:** USEPA/540/S-95/504, April 1996.

Utah Division of Radiation Control, 2011, **DRC Notice of Enforcement Discretion and Confirmatory Action Letter:** letter sent to Chuck Wentz, Rio Algom Mining LLC, February 7, 2011.



EXPLANATION

- MW-5 — Well and Identifier
- 6588.6 — Water Level Elevation (feet above mean sea level)
- 6577 — Top of Screened Interval
- 6547 — Bottom of Screened Interval
- Lisbon Valley Fault, ball and bar on downthrown side
- Long-term Surveillance and Monitoring Boundary
- Approximate Extent of Dry Zone in Burro Canyon Aquifer in 2003
- Dry Zone in Burro Canyon Aquifer Along Axis of Lisbon Valley Anticline

N

0 1,000 2,000 3,000 4,000

Feet

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LISBON FACILITY

SITE OVERVIEW MAP

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Water Resource Consultants

2011

FIGURE 1

GIS\1350.05\SiteOverviewMap\14Dec2011 NAD27_SP_Utah_So.

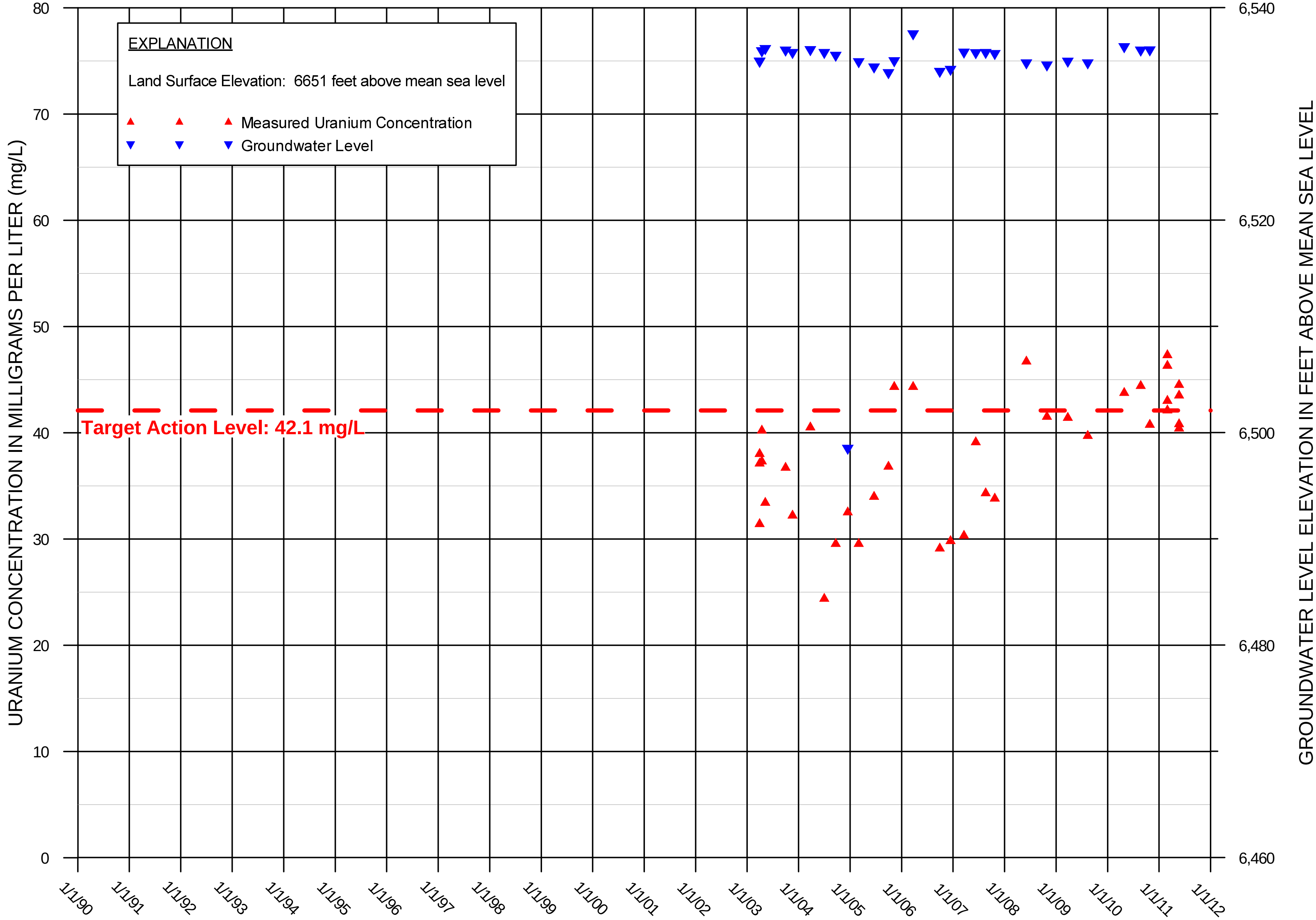

FIGURE 2. URANIUM CONCENTRATIONS AND GROUNDWATER LEVELS FOR TREND WELL RL-1, LISBON FACILITY, RIO ALGOM MINING LLC

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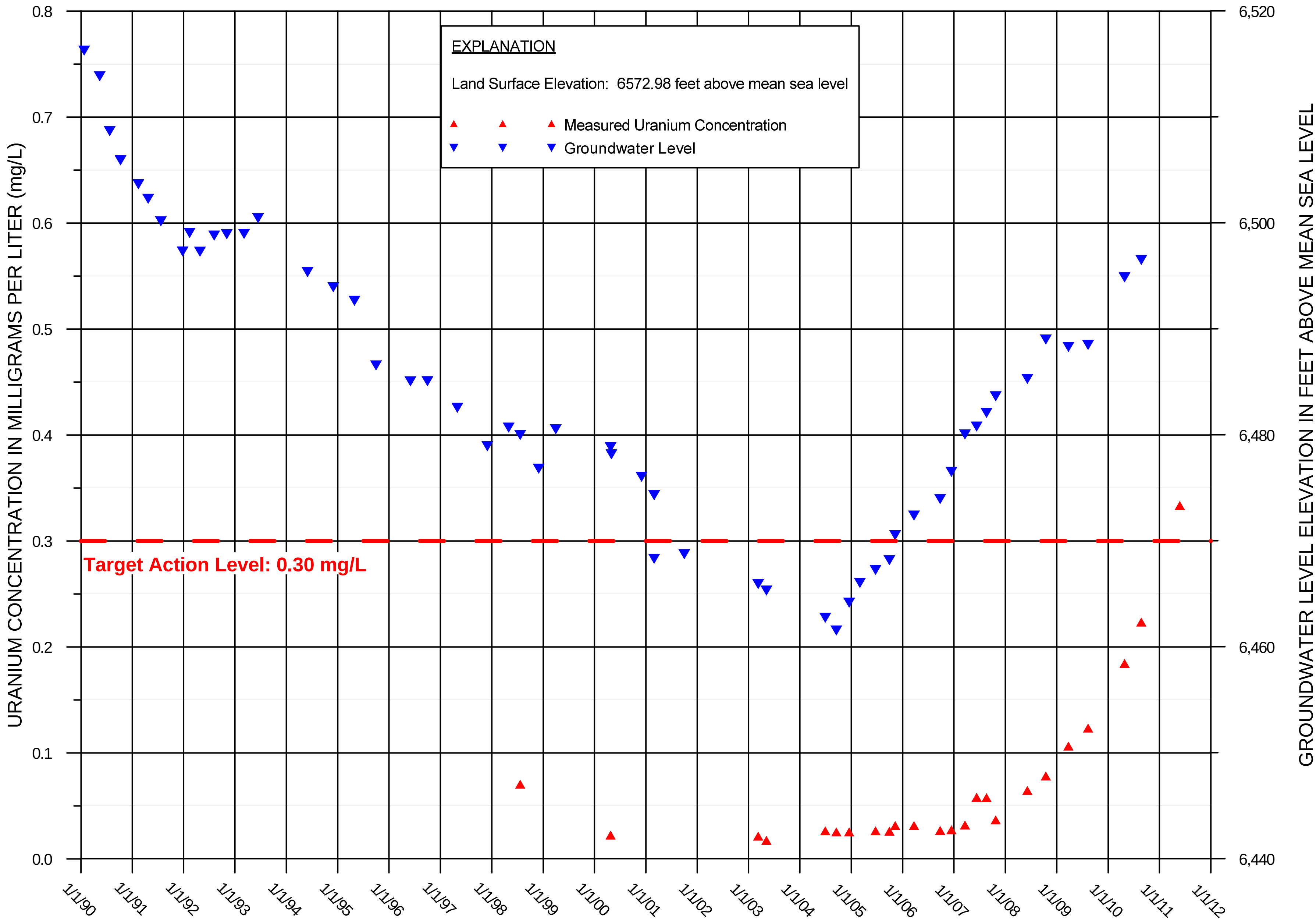
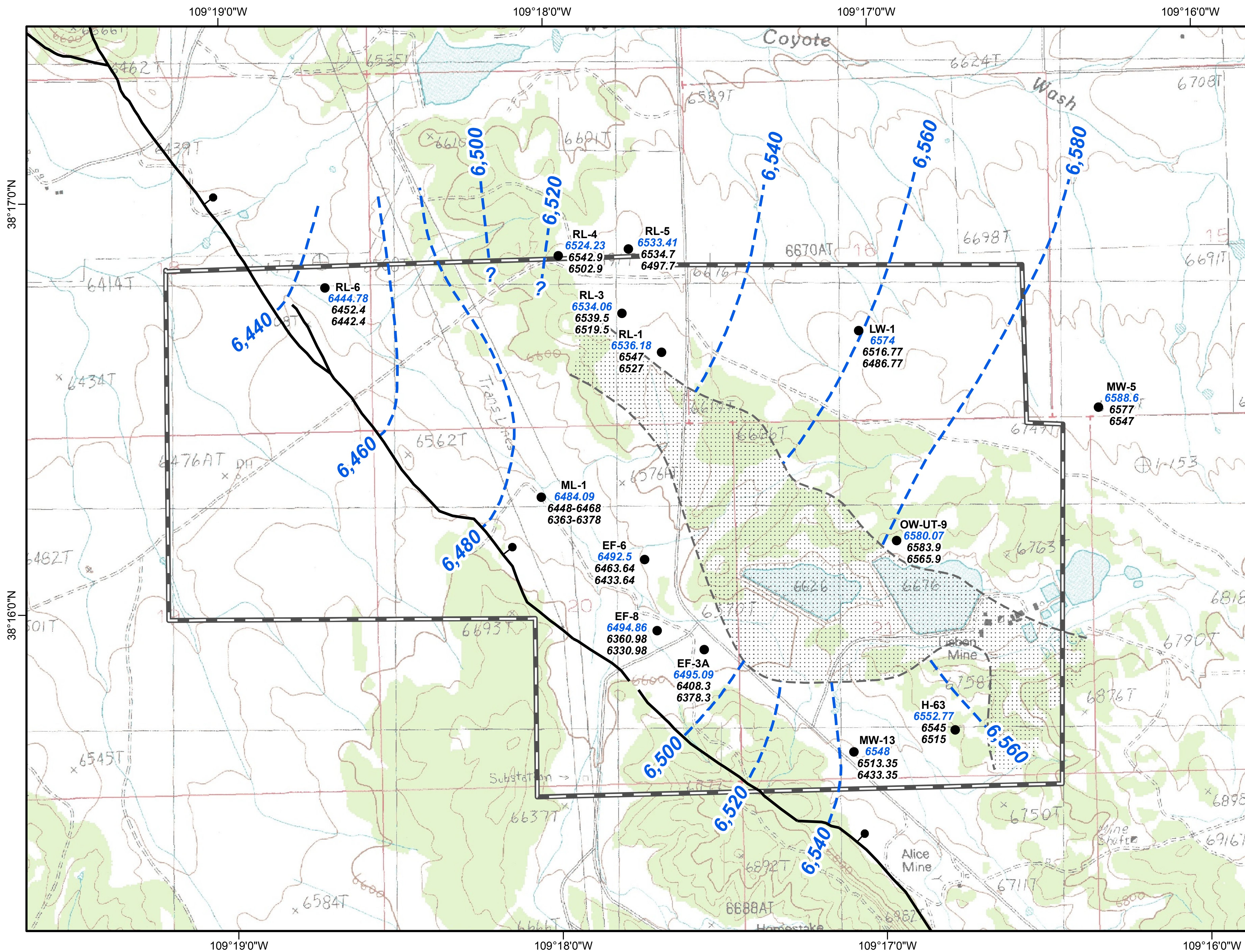


FIGURE 3. URANIUM CONCENTRATIONS AND GROUNDWATER LEVELS FOR TREND WELL EF-8, LISBON FACILITY, RIO ALGOM MINING LLC

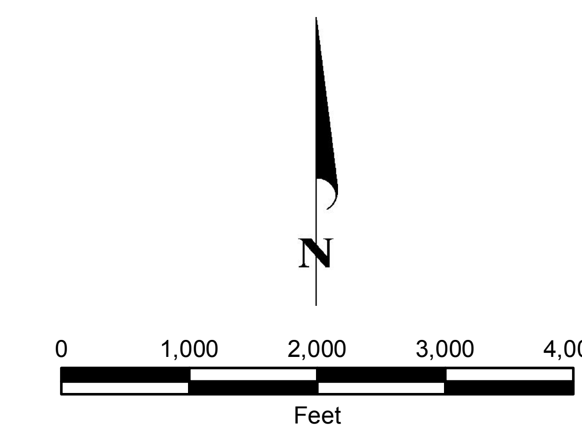
MONTGOMERY & ASSOCIATES

1350 - S:\projects\1350 - Rio Algom\Sampling\Plots_and_Data\EF_8 REV2.grf 10/21/2011



EXPLANATION

- Well and Identifier (example: MW-5)
- 6588.6 — Water Level Elevation (feet above mean sea level)
- 6577 — Top of Screened Interval
- 6547 — Bottom of Screened Interval
- 6,580 — Water Level Contour, in feet above mean sea level; dashed where inferred
- Lisbon Valley Fault, ball and bar on downthrown side
- Long-term Surveillance and Monitoring Boundary
- Approximate Extent of Dry Zone in Burro Canyon Aquifer in 2003
- Dry Zone in Burro Canyon Aquifer Along Axis of Lisbon Valley Anticline



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2010 GROUNDWATER LEVEL CONTOURS IN BURRO CANYON AQUIFER

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2011

FIGURE 4

GIS\1350.05\2010_WLcont2\14Dec2011 NAD27_SP_Utah_So.

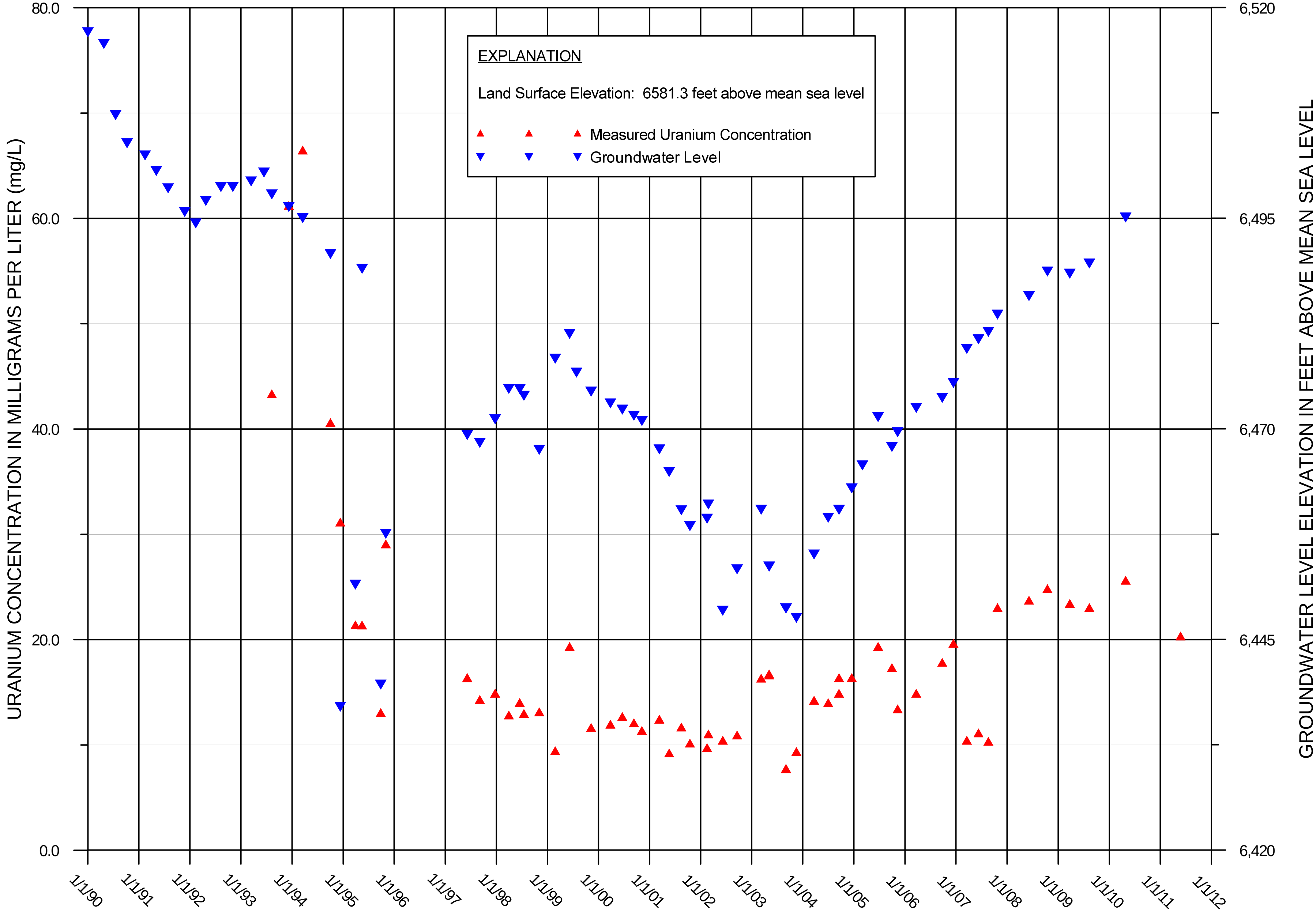

FIGURE 5. URANIUM CONCENTRATIONS AND GROUNDWATER LEVELS FOR TREND WELL EF-3A, LISBON FACILITY, RIO ALGOM MINING LLC

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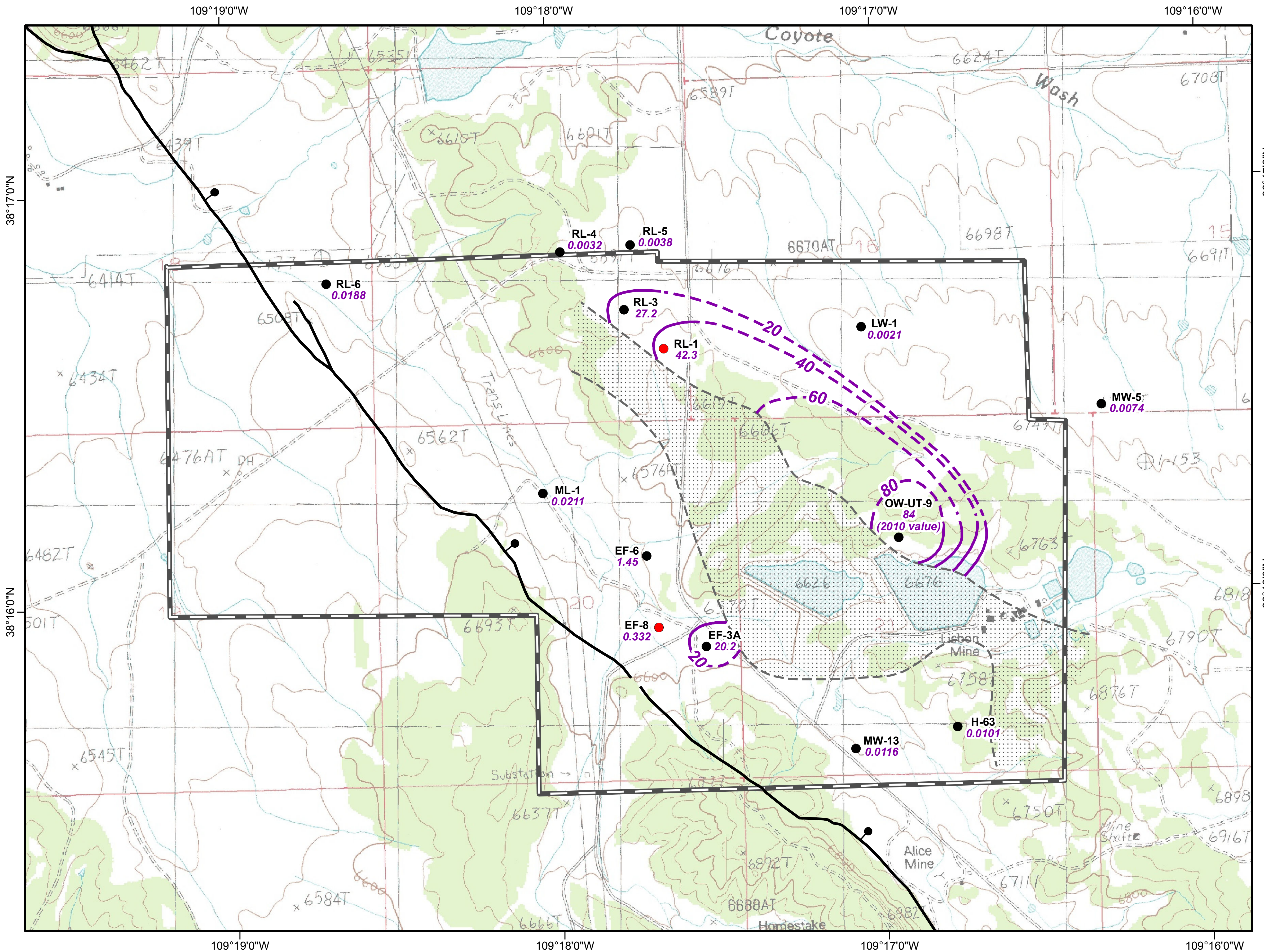

EXPLANATION

MW-5 0.0074 Well and Identifier

Uranium Concentration, in milligrams per liter (mg/L)

EF-8 Out of Compliance Well and Identifier

60 Uranium Concentration (mg/L); dashed where inferred

Long-term Surveillance and Monitoring Boundary

Fault

Approximate Extent of Dry Zone in Burro Canyon Aquifer in 2003

Dry Zone in Burro Canyon Aquifer

N

0 1,000 2,000 3,000 4,000

Feet

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2011 URANIUM CONCENTRATIONS

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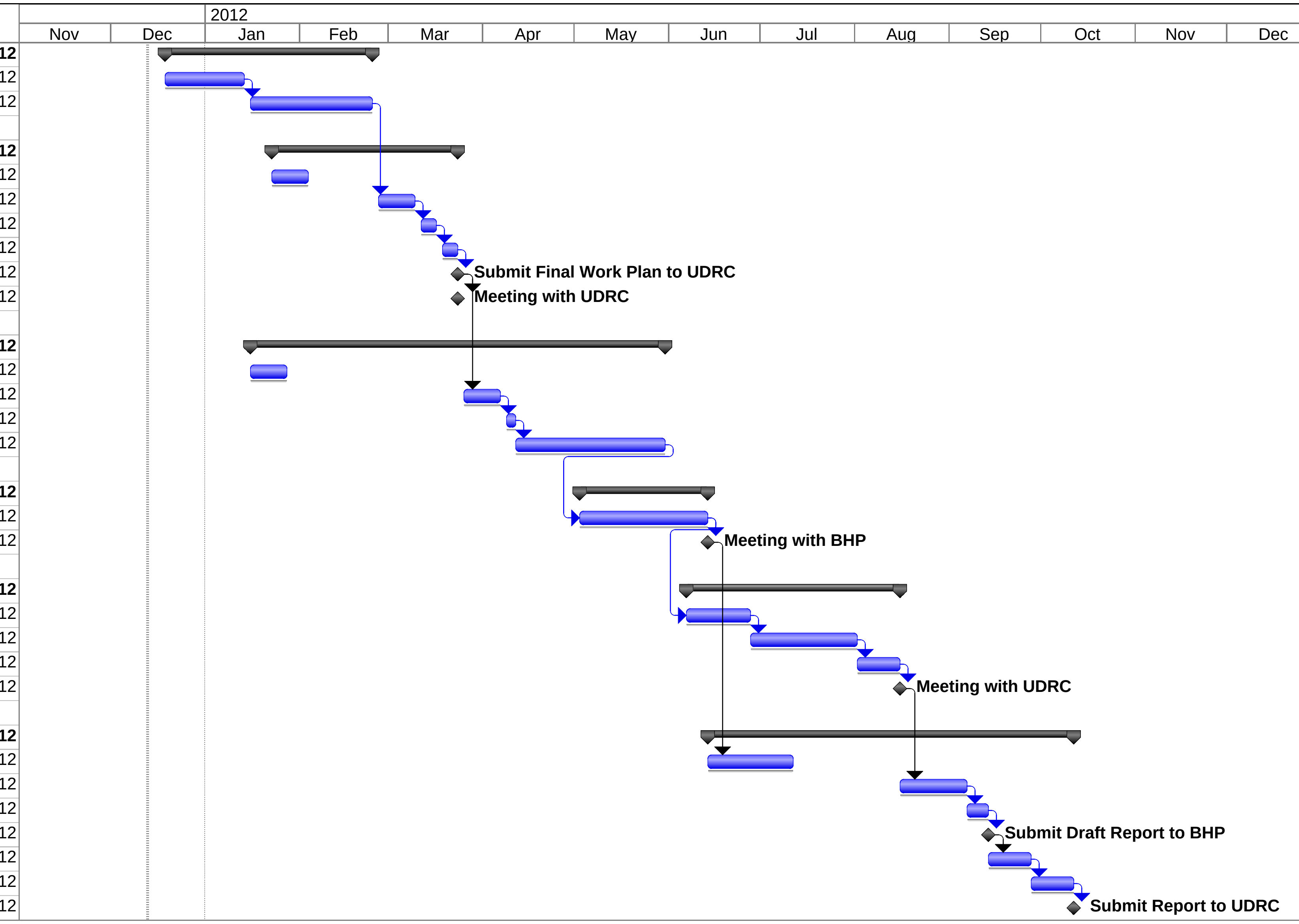
FIGURE 6

GIS\1350.05\2011_Uranium\14Dec2011 NAD27_SP_Utah_So.

FIGURE 7. SCHEDULE
SUPPLEMENTAL SITE ASSESSMENT TO ADDRESS OUT OF COMPLIANCE STATUS AT TREND WELLS RL-1 AND EF-8
LISBON FACILITY
RIO ALGOM MINING LLC

ID	Task Name	Duration	Start	Finish
1	**TASK 1 - CONDUCT PHASE 1 GROUNDWATER MODELING**	**50 days**	**Mon 12/19/11**	**Fri 2/24/12**
2	Construct Model	20 days	Mon 12/19/11	Fri 1/13/12
3	Conduct Sensitivity Analysis/Develop Final Field Program	30 days	Mon 1/16/12	Fri 2/24/12
4				
5	**TASK 2 - PREPARE FINAL WORK PLAN**	**45 days**	**Mon 1/23/12**	**Fri 3/23/12**
6	Prepare Well Installation and Testing Specifications	10 days	Mon 1/23/12	Fri 2/3/12
7	Prepare Draft Final Work Plan	10 days	Mon 2/27/12	Fri 3/9/12
8	BHP Review	5 days	Mon 3/12/12	Fri 3/16/12
9	Prepare Final Draft Document	5 days	Mon 3/19/12	Fri 3/23/12
10	Submit Final Work Plan to UDRC	0 days	Fri 3/23/12	Fri 3/23/12
11	Meeting with UDRC	0 days	Fri 3/23/12	Fri 3/23/12
12				
13	**TASK 3 - CONDUCT FIELD PROGRAM**	**98 days**	**Mon 1/16/12**	**Wed 5/30/12**
14	Geophysical Surveys	10 days	Mon 1/16/12	Fri 1/27/12
15	Prepare for Field Work	10 days	Mon 3/26/12	Fri 4/6/12
16	Mobilize to Site	3 days	Mon 4/9/12	Wed 4/11/12
17	Drilling/Well Construction/Development/Testing	35 days	Thu 4/12/12	Wed 5/30/12
18				
19	**TASK 4 - EVALUATE FIELD DATA**	**30 days**	**Thu 5/3/12**	**Wed 6/13/12**
20	Evaluate Testing and Analytical Data	30 days	Thu 5/3/12	Wed 6/13/12
21	Meeting with BHP	0 days	Wed 6/13/12	Wed 6/13/12
22				
23	**TASK 5 - CONDUCT PHASE 2 GROUNDWATER MODELING**	**50 days**	**Thu 6/7/12**	**Wed 8/15/12**
24	Revise Groundwater Model	15 days	Thu 6/7/12	Wed 6/27/12
25	Conduct Sensitivity Analysis	25 days	Thu 6/28/12	Wed 8/1/12
26	Evaluate Remedy/Develop New Alternate Concentration Limits (ACLs)	10 days	Thu 8/2/12	Wed 8/15/12
27	Meeting with UDRC	0 days	Wed 8/15/12	Wed 8/15/12
28				
29	**TASK 6 - PREPARE REPORT**	**86 days**	**Thu 6/14/12**	**Thu 10/11/12**
30	Prepare Summary of Field Program	20 days	Thu 6/14/12	Wed 7/11/12
31	Prepare Summary of Modeling and ACLs	16 days	Thu 8/16/12	Thu 9/6/12
32	Complete Draft Report	5 days	Fri 9/7/12	Thu 9/13/12
33	Submit Draft Report to BHP	0 days	Thu 9/13/12	Thu 9/13/12
34	BHP Review	10 days	Fri 9/14/12	Thu 9/27/12
35	Incorporate Comments/Revise Report	10 days	Fri 9/28/12	Thu 10/11/12
36	Submit Report to UDRC	0 days	Thu 10/11/12	Thu 10/11/12



Project: Fig 7 - SSA Schedule
Date: Tue 12/13/11

Task	Progress	Summary	External Tasks	Deadline
Split	Milestone	Project Summary	External Milestone	

MONTGOMERY & ASSOCIATES