

SAFETY EVALUATION REPORT

DATE: November 12, 2019

DOCKET: 040-08903

LICENSEE: Homestake Mining Company of California

SITE: Grants Reclamation Project

PROJECT MANAGER: Ron Linton

TECHNICAL REVIEWER: George Alexander

SUBJECT: Groundwater Monitoring Plan License Amendment Request

SUMMARY

By letter dated November 20, 2017,¹ the Homestake Mining Company of California (HMC) submitted a license amendment request (LAR) to the U.S. Nuclear Regulatory Commission (NRC) staff for review and approval. In its letter, HMC proposed an update to the groundwater monitoring plan to adjust the compliance monitoring for the groundwater restoration areas at the Grants Reclamation Project (Grants) site, in part, to take into account changes in the restoration program. The NRC staff determined that HMC's proposed request to amend the groundwater monitoring at the Grants site is acceptable. The proposed monitoring well network provides for enhanced monitoring of restoration activities at the site. The NRC staff has reviewed the location of the monitoring wells, and the NRC staff has determined that the proposed wells are reasonably located both within and downgradient of regions of contamination that exceed the groundwater protection standards in the Alluvial, Upper, Middle, and Lower Chinle aquifers. The monitoring wells also appear to be reasonably located in both the mixing and non-mixing zones within the Chinle aquifers. Accordingly, the NRC staff concludes that the proposed monitoring wells listed in Appendix B of this report are adequate for the evaluation of the effectiveness of the groundwater corrective action program.

BACKGROUND

The Grants site is in Cibola County, New Mexico, approximately 5.5 miles north of the Village of Milan. Uranium milling began at the site in 1958 and continued until 1990. A total of 22 million tons of ore were milled at the site using an alkaline leach process. From 1993 to 1995, the mill was decommissioned and demolished. The site has two tailings piles – the Large Tailings Pile (LTP) and Small Tailings Pile (STP) and three evaporation ponds. Five residential areas are located within 2 miles of the site with the nearest (i.e., Murray Acres) located approximately 3,000 feet downgradient from the LTP and STP.

The Grants site is underlain by the San Mateo alluvial aquifer; the Upper, Middle, and Lower Chinle aquifers; and the San Andres-Glorieta (SAG) aquifer. The San Andres limestone and the Glorieta sandstone act as one aquifer as they are hydraulically connected. Groundwater flow in the San Mateo alluvial aquifer beneath the site is generally from north to south and eventually flows into the Rio San Jose alluvial aquifer to the Southwest of the site. However, the

¹ Agencywide Documents and Management System (ADAMS) Accession No. ML18018A102.

groundwater flow near the Grants site has been altered by groundwater restoration activities with significant groundwater collection and injection. Recent groundwater characterization data, including detailed groundwater flow directions in the San Mateo alluvium aquifer, can be found in the 2018 Annual Monitoring Report/Performance Review for HMC's Grants Project² in Figure 4.2-1. Beneath the San Mateo alluvium is the Chinle formation, which consists primarily of massive shale interspersed with sandstone. There are three saturated zones within the Chinle Formation beneath the site – the Upper, Middle, and Lower Chinle aquifers. Groundwater flow in the Chinle aquifers is complex due to all three of the Chinle aquifers subcropping (i.e., intersecting) with the alluvial aquifer in different locations. These subcrop areas are defined as a single Chinle Mixing Zone. Regions of the Chinle saturated zones that are not influenced by the alluvial aquifer are defined as the Upper, Middle, and Lower Chinle Non-Mixing Zones. Two structural faults, identified as the East Fault and West Fault, further complicate groundwater flow near the site. Both faults trend northeast/southwest and are identified in Figure 1.1-1 of the 2018 Annual Monitoring Report/Performance Review for HMC's Grants Project. The SAG aquifer lies beneath the Chinle Formation. Groundwater Protection Standards have been established for the Alluvial Aquifer, Chinle Mixing Zone, Upper Chinle Non-Mixing Zone, Middle Chinle Non-Mixing Zone, and the Lower Chinle Non-Mixing Zone.

The current groundwater monitoring program under License Condition 35 was approved on September 28, 2000, by License Amendment 33.³ The groundwater monitoring program, referred to as Table 2 (8-99), which was submitted on September 29, 1999,⁴ is reproduced in Appendix A of this report. License Condition 35A states:

Implement the groundwater monitoring shown in Table 2 (8-99) submitted September 29, 1999, except that under "Reversal Wells," delete Well KF and replace with Well DZ, and except that well CW2 will remain in the sampling program monitoring annually for G list of parameters, and Cr is to be deleted from the D and F lists of parameters.

Well DD and one additional monitoring well to the middle of the southeast side of EP3 (to be named later) is to be added to the Table list and will be monitored semi-annually for the B and F list of parameters. The additional well is to be installed and monitored quarterly for at least two quarters prior to EP3 becoming operational to determine background water quality for the well.

In NRC's Technical Evaluation Report (TER) dated September 28, 2000,⁵ the NRC staff concluded that the licensee's groundwater monitoring program was sufficient to provide a clear understanding of contaminant movement and Groundwater Corrective Action Plan (CAP) results at the site.

On March 15, 2012, HMC submitted an Updated CAP,⁶ and the NRC staff provided a Request for Additional Information (RAI) on April 30, 2015.⁷ In that RAI, the NRC staff stated that the proposed compliance monitoring plan in the updated CAP did not provide the level of detail necessary to evaluate the performance of the CAP. The request further stated,

² ADAMS Accession Package No. ML19101A370.

³ ADAMS Accession No. ML010160227.

⁴ ADAMS Accession No. ML12291A902.

⁵ ADAMS Accession No. ML010160227.

⁶ ADAMS Accession Package No. ML12205A186.

⁷ ADAMS Accession Package No. ML13360A224.

Criterion 7A of 10 CFR Part 40, Appendix A, requires the licensee to establish and implement a corrective action monitoring program when the groundwater protection standards have been determined to be exceeded. The purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions being implemented by the CAP. The corrective action monitoring program should be a robust monitoring program capable of demonstrating restoration progress and the effectiveness of the CAP within the alluvial aquifer, the Upper, Middle, and Lower Chinle aquifers and their associated mixing zones on an annual basis, both on-site and off-site.

Criterion 7, further states that “Any monitoring program required under this paragraph may be based on existing monitoring programs to the extent the existing programs can meet the stated objective for the program.” The NRC staff considers the proposed compliance monitoring program incapable of meeting the requirements of a corrective action monitoring program and demonstrating the effectiveness of the corrective actions and the annual restoration progress.

The NRC would further state, in that RAI:

Table 7.2.2-1 shall be revised to include a corrective action monitoring program to assess the performance of the groundwater CAP within the alluvial, the Upper, Middle, and Lower Chinle aquifers and their associated mixing zones. This modification will provide an improved understanding of the current locations under groundwater corrective actions for each of the specified aquifers. The designated corrective action monitoring wells will provide a consistent and transparent assessment of the year-to-year performance of the CAP. The proposed corrective action monitoring program should result in a level of detail already provided in the Annual Monitoring Report and Performance Review submitted to the NRC on an annual basis. The NRC staff believes that the additional monitoring program is required to fulfill the regulatory requirements of Criterion 7A and would satisfy the requirement for additional monitoring wells in License Condition 35B.

To address, in part, NRC staff's comments regarding the requirement to implement a monitoring program to assess the groundwater corrective actions, HMC proposed updating the groundwater monitoring plan in the LAR. The proposed update to the groundwater monitoring plan also accounts for changes in the restoration program and problematic wells. Groundwater restoration for the Grants site are separated into three areas: On-Site, South Off-Site, and North Off-Site restoration areas, as shown in Figure 1-1 of the LAR. Sections 2.1 to 2.4 of the LAR describe the monitoring wells that will be used to monitor water quality and restoration in the Alluvial, Upper Chinle, Middle Chinle, and Lower Chinle aquifers, respectively. Figures 2-2 to 2-5 of the LAR provide the location of the proposed compliance monitoring wells and areas of contamination exceeding the site standards for the Alluvial, Upper Chinle, Middle Chinle, and Lower Chinle Aquifers, respectively. These wells, which are listed in Appendix B of this report, are intended to be used to demonstrate groundwater restoration at the Grants site relative to site standards. As discussed in the LAR, these wells have already been installed and are currently being sampled. Appendix C of this report includes the proposed list of parameters to be monitored, laboratory methods of analysis, detection limits, and units for each parameter. In

response to an NRC RAI comment dated September 28, 2018,⁸ HMC provided specific proposed changes to License Condition 35A by letter dated October 18, 2018.⁹ By correspondence dated July 31, 2019,¹⁰ HMC provided updates to Tables 2-1 and 2-2 of the November 17, 2017, submission and that were discussed in the October 18, 2018, response to NRC RAI. By correspondence dated October 8, 2019,¹¹ HMC provided an update to Table 2-1 of the November 17, 2017, submission, and included a copy of Table 2-2 that was updated on July 31, 2019. The October 8, 2019, update changed one well reference from Deep #2@ to Deep #2R since well Deep #2R was installed during the review period. The NRC staff evaluation and proposed license changes are provided below.

NRC STAFF EVALUATION

The NRC staff approves HMC's proposed request to amend the groundwater monitoring at the Grants site. The proposed groundwater compliance monitoring network expands the number of compliance wells from 33 to 107, not including the collection and injection wells. HMC removed two wells from the network where well access is restricted by current property owners, and four wells were exchanged with other wells to better define groundwater conditions. The proposed network also updates the coverage of monitoring for the restoration areas, as shown in Figures 2-2, 2-3, 2-4, and 2-5 of the LAR. As discussed in the LAR, the proposed groundwater compliance monitoring wells were already part of the monitoring network and are currently being sampled. In review of the location of the monitoring wells, the NRC staff has determined that the proposed wells are reasonably located both within and downgradient of regions of contamination that exceed the groundwater protection standards in the Alluvial, Upper, Middle, and Lower Chinle aquifers. The monitoring wells also appear to be reasonably located in both the mixing and non-mixing zones within the Chinle aquifers. Accordingly, the NRC staff concludes that the proposed monitoring wells listed in Appendix B of this report are adequate for the evaluation of the effectiveness of the corrective action program.

In addition, the licensee is not proposing to change the analytes in the monitoring program for the wells completed in the alluvial aquifer, the Upper Chinle, Middle Chinle, or Lower Chinle aquifers. However, the licensee proposed 19 analytes for 4 SAG wells (i.e., Deep #1R, Deep #2R, 943M, and 951R) versus 31 analytes previously for the 2 SAG well (i.e., Deep #1 and Deep #2). The analytes that were proposed to be removed from the SAG wells are Al, As, Ba, Cd, Co, Cu, CN, F, Fe, Pb, Mn, Hg, Ni, Ag, and Zn. The NRC staff determined that the proposed list of analytes (i.e., water level, pH, total dissolved solids, sulfate, chloride, bicarbonate, carbonate, Na, Ca, Mg, K, nitrate, U, Se, Mo, Ra-226, V, Ra-228, Th-230) is acceptable, because the proposed list of analytes includes the primary indicator species (e.g., Total Dissolved Solids (TDS), NO₃, SO₄, and Cl). Furthermore, the proposed list of analytes for the SAG wells includes the primary contaminants of concern that have exceeded the groundwater protection standards in the overlying aquifers.

By letter dated September 28, 2018, the NRC staff requested additional information on HMC's groundwater monitoring strategy to consolidate the groundwater monitoring well network as groundwater remediation is completed. As stated in 10 CFR Part 40, Appendix A, Criterion 7A, "[t]he purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions." Groundwater restoration activities have the potential to decrease

⁸ ADAMS Accession No. ML18214A218.

⁹ ADAMS Accession No. ML18298A019.

¹⁰ ADAMS Accession No. ML19219A477.

¹¹ ADAMS Accession No. ML19281C055.

contaminant concentrations in the short term, followed by a subsequent increase in contaminant concentrations (i.e., rebound) after the cessation of restoration activities. Accordingly, a monitoring period may be established after the cessation of restoration activities to demonstrate complete restoration of the aquifer(s). The LAR did not provide discussion on the strategy to consolidate the groundwater monitoring well network after groundwater restoration has been completed in areas with contamination nor did it include discussion of a proposed monitoring period after the cessation of corrective actions. Accordingly, additional information was requested by NRC staff on September 28, 2018, regarding Homestake's proposed consolidation strategy and restoration monitoring period.

By letter dated October 18, 2018, HMC responded to the NRC staff's RAI comment:

HMC plans to monitor the compliance wells in an area where the restoration is deemed to be completed at a quarterly frequency for two years after cessation of corrective action to verify stability of the water quality. The samples will be analyzed for all site standard constituents. An evaluation of the stability of the groundwater quality in the restored area will be conducted. This evaluation of the groundwater quality stability will include a determination if these compliance monitoring wells can be removed from the groundwater monitoring program. Presently, the seven wells in the Western Portion of the North Off-Site Wells are being sampled at a quarterly frequency for two years for all alluvial groundwater site standard constituents. An evaluation is expected to be conducted and submitted in 2020 to determine if these wells should be removed from the compliance monitoring program.

The NRC staff has determined that HMC's suggested monitoring program after the cessation of corrective actions is acceptable, which is consistent with New Mexico Environment Department's (NMED) requirements found in Title 20, Environmental Protection, Chapter 6, Water Quality, Part 2, Ground and Surface Water Protection, Section 20.6.2.4103, Abatement Standards and Requirements. However, the monitoring program for individual wells after the cessation of corrective actions may need to be considered on a case-by-case basis in some instances. For example, the removal of downgradient monitoring wells in an area where restoration activities have ceased might not be justified if upgradient restoration activities are affecting the downgradient wells. In response to HMC's proposed 5-spot injection pattern, the NRC staff discussed in a letter dated April 2, 2019,¹² that HMC's restoration activities appear to be unbalanced in that more water was being injected into the subsurface than collected, which would result in dilution. For compliance wells to be removed from the license, HMC would need to demonstrate that if there are any upgradient restoration activities, then those restoration activities are not resulting in dilution at these downgradient wells. The NRC staff expects the licensee to continue monitoring all compliance wells as approved in Appendix B and Appendix C of this report, which will be tied to the license SUA-1471 by the licensee's October 8, 2019, submission, until the NRC staff approves a license amendment to remove compliance wells no longer deemed necessary. The NRC staff expects that a network of groundwater monitoring wells, which may be a subset of these compliance monitoring wells, will be established for long-term surveillance. Therefore, not every well that meets the compliance standard in a specific area or aquifer should be removed. A subset of specific wells should be maintained and sampled, possibly at a reduced frequency or for a smaller set of contaminants, with the anticipation that this subset will be used for long-term surveillance when the site eventually is turned over to a long-term custodian for perpetual care and maintenance.

¹² ADAMS Accession Package No. ML19050A016.

In addition, the NRC staff also provides two observations related to monitoring in the Middle Chinle and SAG and HMC's proposed groundwater monitoring consolidation strategy and are discussed below.

First, by letter dated September 28, 2018, the NRC staff requested additional information on HMC's LAR. As part of that RAI, the NRC staff requested additional information to verify that restoration is not needed in the Middle Chinle aquifer to the north of the LTP. In Section 2.3 of the LAR, HMC stated that restoration north of CW17 is not required because these concentrations are natural. Figures 1.1-20 to 1.1-23 in the 2018 Annual Monitoring Report/Performance Review, which are from 1982, 1996, 1999, and 2014, respectively, do not show evidence of contamination exceeding the groundwater protection standards in the Middle Chinle aquifer to the north of the LTP. However, Figure 1.1-24 from the 2018 Annual Monitoring Report/Performance Review shows contamination exceeding the groundwater protection standards to the north of the LTP. Section 6.3.4 of the 2018 Annual Monitoring Report/Performance Review stated that uranium concentrations in the Middle Chinle aquifer, west of the West Fault, northwest of the LTP, naturally exceed 0.18 milligrams per liter (mg/L). The 2018 Annual Monitoring Report/Performance Review further stated that values in several wells have increased above this level from the movement of alluvial water in the subcrop to these wells. By letter dated October 18, 2018, HMC responded to the NRC's September 28, 2018, RAI and provided additional information to support the argument that the observed concentrations are naturally occurring. The NRC staff determined that the low chloride concentrations to the north of the LTP in the Middle Chinle coupled with the relatively stable uranium concentration at Wells CW24 and CW35 support the argument that the concentrations observed at Well CW35 are naturally occurring. Although HMC did not include Well CW35 in the proposed compliance monitoring wells, monitoring data from Well CW35 is included in HMC's Annual Groundwater Monitoring Reports, and the NRC staff will continue to review these data.

Second, by letter dated May 10, 2018,¹³ the NRC staff, in coordination with NMED and the U.S. Environmental Protection Agency (EPA), stated that Well 943 should be plugged and abandoned as recommended by HMC in letter dated April 3, 2018,¹⁴ because of leakage into the SAG aquifer. By letter dated July 26, 2018,¹⁵ HMC discussed that Well 943 was abandoned in July 2018 and proposed additional groundwater monitoring of the SAG to be included in HMC's LAR. The proposed groundwater compliance monitoring well in HMC's LAR, includes four SAG wells: Deep #1R, Deep #2R, Well 943M, and Well 951R. HMC proposed in the July 26, 2018, letter to add four more SAG monitoring wells: 806R, 949, 955, and 991 to provide additional monitoring of potential contamination from Well 943. However, by letter dated January 24, 2019,¹⁶ the NRC staff, in coordination with NMED and the EPA, determined that none of these wells are adequate to monitor contamination from Well 943, stating:

Specifically, the NRC staff has determined that additional information is needed to demonstrate that any contamination from Well 943 is not capable of posing a substantial present or potential hazard to human health or the environment. This could be demonstrated by additional monitoring of the SAG downgradient from

¹³ ADAMS Accession No. ML18120A331.

¹⁴ ADAMS Accession No. ML18117A230.

¹⁵ ADAMS Accession No. ML18236A552.

¹⁶ ADAMS Accession No. ML19002A503.

Well 943 and/or an analysis demonstrating that contamination from Well 943 is not risk significant.

The NRC staff, in coordination with NMED and the EPA, will continue to evaluate information provided by HMC regarding contamination stemming from Well 943.

A draft of this NRC evaluation was provided to EPA, NMED, Department of Energy and the New Mexico Office of State Engineer for comment. The NRC staff received a comment from NMED staff requesting that several SAG wells, 806R, 949, 955, and 991, be added to the monitoring network. The NRC staff responded that the licensee doesn't have regular access for these wells which would preclude them from being added to the licensed monitoring network.¹⁷ However, the NRC staff has determined that HMC should continue to attempt to monitor these wells when they have access.

RECOMMENDED LICENSE CHANGES

35. The licensee shall implement a groundwater compliance monitoring program to assess the performance of the groundwater restoration program. This program is separate from the requirements in License Condition 15. The Licensee shall:

A. Implement the groundwater monitoring shown in Tables 2-1 and 2-2 of the Groundwater Monitoring Plan submitted by the licensee dated November 20, 2017 (ML18018A102), as updated by the licensee in correspondence dated October 8, 2019 (ML19281C055).

B. Unchanged

C. Unchanged

D. Unchanged

E. Unchanged

The NRC staff provided the draft license condition 35A language to the licensee. The licensee agreed with the proposed change in correspondence dated October 22, 2019.¹⁸

ENVIRONMENTAL REVIEW

Background

The Statements of Consideration – *Discussion and Finding* (49 FR 9352, March 12, 1984) states the following:

Some requests for amendment to these types of licenses are administrative, organizational or procedural in nature or involve changes in process operations and equipment which do not result in any significant adverse incremental impacts to the environment from the licensed activity. Implementation of these minor or routine types of changes do no significantly alter the previously evaluated environmental impacts

¹⁷ ADAMS Accession No. ML19305B058.

¹⁸ ADAMS Accession No. ML19297D526.

associated with the licensed operation, taking into account construction impacts, types and amounts of effluents released by the operation, occupational exposure of employees, or potential accidents. Furthermore, these amendments do not affect the scope or nature of the licensed activity.

Categorical Exclusion

The categorical exclusion in 10 CFR 51.22(c)(11) applies to the issuance of amendments to materials licenses issued for the possession and use of source material for uranium milling. Furthermore, in order for the 10 CFR 51.22(c)(11) categorical exclusion to apply, the proposed action must meet the criteria listed in 10 CFR 51.22(c)(11)(i)-(iv). An analysis of these provisions is provided below.

- (a) 10 CFR 51.22(c)(11)(i) - There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The proposed action would not involve any changes to effluents. The proposed action is to change the designation of several monitoring wells to compliance monitoring wells and to take into account changes in the restoration program and problematic wells. Therefore, there is no significant change in the types or increase in the amounts of effluents that may be released offsite.

- (b) 10 CFR 51.22(c)(11)(ii) - There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed action would not involve any significant changes to public or occupational radiation exposures. The same wells that are currently being monitored will continue to be monitored, only the designation of the wells has changed. Therefore, there is no significant increase in individual or cumulative occupational radiation exposure.

- (c) 10 CFR 51.22(c)(11)(iii) - There is no significant construction impact.

The proposed action would not involve any construction activities. Therefore, there is no significant construction impact.

- (d) 10 CFR 51.22(c)(11)(iv) – There is no significant increase in the potential for or consequences from radiological accidents.

The proposed action is to change the designation of several monitoring wells to compliance monitoring wells and to take into account changes in the restoration program and problematic wells. Therefore, there is no significant increase in the potential for or consequences from radiological accidents.

This proposed action meets all of the provisions in 10 CFR 51.22(c)(11). The NRC staff has determined that the change requested to the groundwater monitoring plan meets the eligibility for the categorical exclusion set forth in 10 CFR 51.22(c)(11) and is a category of actions that does not result in any significant effect, either individually or cumulatively, on the human environment. Therefore, the preparation of an environmental assessment or environmental impact statement is not required.

Agencies and Persons Consulted

The NRC staff has determined that the proposed action will not affect listed species or critical habitat. Therefore, no further consultation is required under Section 7 of the Endangered Species Act. Likewise, the NRC staff has determined that the proposed action is not the type of activity that has the potential to cause effects on historic properties. Therefore, in accordance with 36 CFR 800.3(a)(1), no further obligation is required under Section 106 of the National Historic Preservation Act.

Conclusion

X	1. The action is a CATX and requires no further environmental review.
	2. The action is a CATX but requires additional documentation; see Section 2.1, NUREG-1748. Attach documentation.
	3. The action requires an Environmental Assessment.
	4. The action requires an Environmental Impact Statement.

Appendix A

NRC's Revised TABLE 2 (8-99)

Well Number	Parameters to be Monitored	Frequency of Monitoring
#1 & 2 Deep Wells	D	Annually
Broadview Acres Wells 446, SUB1, SUB2, SUB 3	G	Annually
Felice Acres Wells 490, 492, 493, 494	G	Annually
Murray Acres Wells 802, 844	G	Annually
Pleasant Valley Wells 688, 846	G	Annually
Regional Wells 920, 942	G	Annually
Site Monitoring Wells F, FB, GH, MO, CW2	G	Annually
Collection System Wells	Total Volume	Monthly
Injection System Wells	Total Volume	Monthly
Reversal Wells Water B, BA, KZ, KF, SO, SP, S1, S2	Water Level	Weekly
Point of Compliance Wells D1, X, S4	B, F	Annually
Background Well P	B	Annually

B: Water Level, pH, TDS, SO₄.Cl, HCO₃, CO₃, Na, Ca, Mg, K, NO₃, U, Se, Mo, Ra-226

D: Ca, Mg, K, Na, HCO₃, CO₃, Cl, SO₄, pH, TDS, Al, As, Ba, Cd, Co, Cu, CN, F, Fe, Pb, Mn, Hg, Mo, Ni, NO₃ as N, Se, Ag, Zn, U, Filtered Ra-226

F: V, Ra-228, Th-230

G: Water Level, SO₄, U, Se, TDS, Mo

Appendix B

Table 2-1. Groundwater Monitoring at the Grants Site		
Well	Parameter List Code	Frequency of Monitoring
<i>Alluvial Background Wells</i>		
P, Q, 921	B, F	Annual
<i>Operational Monitoring</i>		
Collection system wells	Total Volume	Monthly
Injection system wells	Total Volume	Monthly
Reversal wells B, BA, KZ, DZ, SM, SN, S2, S5	Water Level	Weekly
<i>San Andres Wells</i>		
Deep #1R, Deep #2R, 943M, 951R	B, F H	Annual Semiannual
<i>Alluvial Compliance Monitoring Wells</i>		
On-Site Monitoring Wells (Evap. Ponds) DD, DD2, X	B, F plus Mn H	Annual Quarterly
Additional On-Site Monitoring Wells 1A, 1K, 639, 802, B11, D1, F, FB, GH, GN, L, L5, K9, M3, MX, MB, MQ, NC, S4, SUB3, T2, T19, T23, T41, T54	B, F	Annual
South Off-Site Wells 490, 497, 540, 631, 643#, 644, 864, 869, Q5, R3, SUB2	B, F	Annual
Section 34 Land application wells 555, 556, 557, 844, 845, 846	B, F	Annual
North Off-Site Wells (includes Section 28 Land application wells) 688, 881, 882, 883, 884, 886, 888, 893, 659, H2A, MR, H55, MO	B, F	Annual
Western Portion of North Off-Site Wells (Includes Section 33 Land application wells) 541, 551, 647, 649, 654, 899, 996	B, F	Annual
<i>Chinle Compliance Monitoring Wells</i>		
Upper Chinle Wells 494, CE2, CE8, CE9, CE15, CF4, CW3, CW13#, CW18, CW25#	B, F	Annual
Middle Chinle Wells 493, ACW, CW17, CW2, CW28, CW45, CW55, CW62, CW76, R3, Y7	B, F	Annual
Lower Chinle Wells CW29, CW32, CW41, CW42, CW43, V6	B, F	Annual

Note: # Monitoring will start after well ceasing to be used for injection

Appendix C

Table 2-2. Site Analytical Suites

Parameter List Code	Included Parameters (Dissolved)	Method	Reporting Limits	Units
B	Water level			
	pH	A4500-HB	0.01	s.u.
	Total dissolved solids (TDS)	A2540 C	20	mg/L
	Sulfate (SO ₄)	E300.0	4	mg/L
	Chloride (Cl)	E300.0	1	mg/L
	Bicarbonate (HCO ₃)	A2320 B	5	mg/L
	Carbonate (CO ₃)	A2320 B	5	mg/L
	Sodium (Na)	E200.7	0.9	mg/L
	Calcium (Ca)	E200.7	0.5	mg/L
	Magnesium (Mg)	E200.7	0.5	mg/L
	Potassium (K)	E200.7	0.5	mg/L
	Nitrate (NO ₃)	E353.2	0.1	mg/L
	Uranium (U)	E200.8	0.0003	mg/L
	Selenium (Se)	E200.8	0.005	mg/L
	Molybdenum (Mo)	E200.8	0.03	mg/L
Radium-226 (Ra-226)	E903.0	Precision Variable	pCi/L	
F	Vanadium (V)	E200.8	0.01	mg/L
	Radium-228 (Ra-228)	RA-05	Precision Variable	pCi/L
	Thorium-230 (Th-230)	E908.0	Precision Variable	pCi/L
H	Water Level			
	TDS	A2540 C	20	mg/L
	SO ₄	E300.0	4	mg/L
	U	E200.8	0.0003	mg/L
	Se	E200.8	0.005	mg/L
	Mo	E200.8	0.03	mg/L
	Cl	E300.0	1	mg/L