HOMESTAKE
Grants Project

Homestake Mining Company of California

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20 August 2018

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ATTN: Mr. Kurt Vollbrecht
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PO Box 5469
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RE: Semi-Annual Environmental Monitoring Report for Period January-June 2018, In Accordance with Nuclear Regulatory Commission Docket No. 40-8903, License No. SUA 1471, and New Mexico Environmental Department DP-200 Ground Water Discharge Plan

Dear Sirs:

Pursuant to US Nuclear Regulatory Commission Regulation 10 CFR 40.65, Part 20, and in accordance with the applicable provisions stipulated in ground water discharge permit DP-200 issued by the New Mexico Environmental Department, please find enclosed copies of the subject Semi-Annual Environmental Report for the first half of 2018 (January-June) for Homestake's Grants Reclamation Project.

Thank you for your time and attention on this matter. If you or anyone on your staff has any questions, please contact me at the Grants office at 505.287.4456, extension 34, or call me directly on my cell phone at 505.290.2187.

Respectfully,

Thomas P. Wohlford

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HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project

SEMI-ANNUAL
ENVIRONMENTAL MONITORING REPORT

Reporting Period
January- June 2018

U.S. Nuclear Regulatory Commission License SUA-1471
State of New Mexico DP-200

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1.0 INTRODUCTION

This Semi-Annual Environmental Monitoring Report summarizes effluent monitoring data recorded for Homestake Mining Company of California - Grants Project (Homestake) from January through June 2018. The submittal of this report to the appropriate Nuclear Regulatory Commission (NRC) Regional Office and State of New Mexico within 60 days after January 1, and July 1 for each year of operation is required for all uranium mill facilities pursuant to 10 CFR Part 40.65. The monitoring data and the report format have been selected by Homestake representatives to satisfy the requirements of 10 CFR Part 40.65 and Discharge Permit No. 200, dated September 18, 2014

Homestake's monitoring and surveillance program for radioactive effluent releases have been designed to ensure the project's compliance with 10 CFR Part 40, and Part 20 U.S. NRC Standards for Protection Against Radiation and closely approximates programs as described in NRC's Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills. Some effluent monitoring activities differ from those presented in the Regulatory Guide 4.14 as required by Homestake's Radioactive Materials License (SUA-1471).

Recontouring reclamation activities began in September 1993 and mill demolition commenced in late October 1993 and was completed December 10, 1995. A mill decommissioning completion report was submitted in February 1996 and approved by the NRC on January 28, 1999. The large tailings pile (LTP) has been re-contoured and covered with an interim cover on the top and radon barrier on the outslopes. Bedding and erosion protection was placed on the outslopes after placement of the radon barrier. Soil cleanup verification of the off-pile contaminated soil (windblown tailings) is complete; the completion report was submitted December 18, 1995 and approved by the NRC on January 29, 1999.

A summary of the operations of groundwater treatment technologies, as required by DP-200 is provided in Section 3.0.

Homestake's groundwater monitoring program, as outlined in license Condition No. 35, continued throughout the report period. The requirements set forth in Condition No. 35 include the reporting of both radiological and non-radiological water quality parameters for specified wells, as well as the documentation of water injection and collection volumes of the groundwater cleanup system. The performance review of the corrective action program is submitted annually as a separate document and contains the groundwater monitoring information for January 1 through December 31 of each year. In order to meet NRC's requirement for semi-annual reporting, groundwater-monitoring data for the point-of-compliance (POC) wells, pond monitoring wells DD, DD2 and X and background well P are included in this report. It should be noted that while the POC wells will eventually be used to demonstrate groundwater restoration, they are not currently representative of off-site groundwater quality conditions.

2.0 ENVIRONMENTAL MONITORING PROGRAMS

The monitoring requirements for the site are summarized in Table 2-1, Table 2-2, and Table 2-3 attached. Details of the monitoring program are discussed in the following sections:

2.1 Air Particulate Monitoring

Homestake continuously samples total suspended particulate at seven locations around the reclamation site (see Figure 1). Those locations identified as HMC-1, HMC-1A, HMC-2 and HMC-3 are areas at the property boundary expected to have the highest predictable concentrations of airborne radioactive particulate. The predominant wind direction is from the southwest; accordingly, HMC-1, HMC-2 and HMC-3 are generally located down wind from Homestake's reclamation activities. HMC-1A is northeast of EP-3 located north of the mill site. The location identified as HMC-6 represents background conditions for air particulates and is located due west of the large tailings pile at the western most side of the property boundary. Locations HMC-4 and HMC-5 are site proximal to the nearest residences. HMC-7 is a blank Whatman filter that is analyzed as a lab and filter manufacturer quality check sample.

Homestake uses Sierra Instruments Model #305-200 High Volume Air Samplers (or equivalent) to continuously sample the ambient air at the locations shown in Figure 1. The samples are collected on 8-inch by 10-inch Whatman glass fiber filters (or equivalent), which are changed weekly or more frequently as required by dust loading. Energy Laboratories, Inc. (ELI) analyzes the collected samples quarterly for Natural Uranium, Radium-226, Thorium-230 and Vanadium. Air sampling flow volumes are recorded by HMC and the data are reported to ELI for calculation of average radionuclide concentrations in air particulates.

The results of environmental air particulate monitoring for 1st half 2018 are provided in Attachment 1.

2.2 Radon Gas Monitoring

Radon-222 gas concentrations in ambient outdoor air are monitored on a continuous basis at the nine locations identified in Figure 1. The background location for radon gas is HMC #16, located northwest of the site. Rapidos high-sensitivity track-etch passive radon monitors (PRM) from Radonova (a division of Landauer), or equivalent, are used to continuously monitor radon gas at each sampling location. Homestake personnel place new PRMs quarterly at the monitoring locations and the exposed detectors are retrieved and returned to the vendor for analysis. The PRM detectors measure radon gas concentrations in ambient outdoor air by exposing a special alpha-particle sensitive plastic chip mounted inside a chamber with a membrane filter on one end that is permeable to air and radon gas, but not to dust or solid phase particulate radionuclides. Radon-222 gas from ambient air diffuses through the membrane, and the subsequent decay of radon gas inside the chamber causes imprint tracks on the alpha-sensitive plastic chip that can be enhanced by a chemical etching process and counted after collection. The radon gas concentration is calculated by determining the number of tracks per unit area of the plastic chip. The semi-annual average results are presented in Attachment 2.

2.3 Effluent and Radon Flux Monitoring

Regulations in 10 CFR 40.65 require licensees to estimate and report the quantities of principal radionuclides released to unrestricted areas in gaseous effluents every six months.

Radon-222 was the only gaseous-phase effluent radionuclide released to unrestricted areas in 2018. The principal sources of radon-222 at the site are the large tailings pile (LTP) and Small Tailings Pile (STP). Radon-222 releases from components of the water treatment system (the Reverse Osmosis [RO] building and evaporation ponds) are insignificant relative to those of the LTP and STP.

Annual flux measurements for calendar year 2018 were made in two separate deployments, consisting of 100 canisters per deployment. The first 100 canister measurements were made on the top of the LTP on May 8-9, 2018. The second 100 canister measurements were made on the STP on May 15-16, 2018. These deployments were conducted in accordance with the methods proposed in HMC's response to the NRC's recent notice of violation (NOV) regarding an average radon flux rate from the LTP that exceeded the 20 pCi/m^2-s standard given in 10 CFR 40, Appendix A (ERG, 2017 and NRC, 2017). The Radon Flux report is provided in Attachment 3. Average Rn-222 flux values of 51.3 and 12.7 picocuries per square meter per second ($pCi\ m^{-2}\ s^{-1}$) for the LTP and STP, respectively were measured in 2018 (Attachment 3).

On April 20, 2017, the NRC issued a notice of violation for the manner in which average radon flux was measured and calculated for 2015 (The 2016 annual flux report, dated January 2017, observed previously existing protocols pending NRC resolution of a regulatory decision on these matters). On April 24-26, 2017 the NRC conducted an onsite inspection, and in associated discussions indicated that side slopes of the LTP, upon which final cover was completed in 1995 (including flux measurements followed by placement of final erosion control material), cannot be used for annual flux estimates unless new flux measurements on the side slopes are conducted. NRC indicated that 100 annual measurements across the top of the LTP, and calculation of the arithmetic mean of the 100 measurements, would be an acceptable approach to meet the requirements of License Condition 36(E) with respect to the LTP. This protocol was observed for the 2018 measurements as detailed in the Annual Radon Flux Report (Attachment 3).

With respect to the STP, the evaporation pond (EP1) is an operational facility as EP1 operations and disposal of additional materials in the STP will continue. Since the STP is still operational, it can be broken into regions in accordance with EPA Method 115, with the pond being one region of zero flux (28.7 acres), and the remaining areas (earthen surfaces) representing a second region (26 acres). Section 2.1.7 of EPA Method 115 provides an explicit mathematical formula for area-weighted averaging of various regions to determine the overall weighted average flux for the entire pile. Under Method 115, calculation of effluent release of radon from the STP for 2018 was based on the flux measurement data noted above (100 flux measurements), and a calculated overall area-weighted average flux for the two regions as follows (excerpted from EPA Method 115):

(b) The mean radon flux for the total uranium mill tailings pile shall be calculated as follows.

$$J_s = \frac{J_1A_1 + J_2A_2 + \ldots + J_iA_i}{A_t}$$

where:

J_s = Mean flux for the total pile (pCi/m²-s)
J_i = Mean flux measured in region i (pCi/m²-s)
A_i = Area of region i (m²)
A_t = Total area of the pile (m²)

Based on the above information and 2018 flux monitoring results, the calculated average radon flux effluent value for the LTP in 2018 is 51.3 pCi/m²-s as reported in the 2018 Annual Radon Flux Report (Attachment 3). With respect to the STP, the arithmetic mean flux for the earthen region of the pile (105,272 m^2 area) was 12.7 pCi/m²-sec. The area of EP1 is approximately 116,204 m^2, and this pond area was assigned a value of zero flux. The overall area-weighted average radon flux for the STP was calculated as follows:

STP Radon Flux = [(26.7 pCi/m^2-s)(105,272 m^2) + (0 pCi/m^2-s)(116,204 m^2)] / (221,148 m^2)
= 12.7 pCi/m^2-s

Based on the measured/calculated 2018 average flux values (51.3 and 12.7 pCi m^{-2} s^{-1} for the LTP and STP, respectively), along with the approximate areal extent of the applicable surfaces including the top of the LTP (≈ 106 acres) and the entire STP (≈ 54.7 acres), the radon emissions from the tailings piles in 2018 are calculated to be 694 Ci and 88.7 Ci respectively. For the first half semiannual reporting period only, effluent radon releases are assumed equivalent to half of these values, or 347 Ci and 44.4 Ci for the LTP and STP respectively.

3.0 OPERATIONS

3.1 Flow Rates

The monthly influent totals to each of the evaporation ponds are presented in Table 3.1-1 for the first half of 2018. Inputs to Evaporation Pond 2 were RO brine, zeolite regeneration, tailings sumps, and transfers from the collection pond. Transfers from Evaporation Pond 2 to Evaporation Pond 1 and transfers from Evaporation Pond 1 to Evaporation Pond 3 are presented in this table as well. The influent into the collection ponds was from well 802, and miscellaneous flow from the RO plant which includes any diverted flow, flow from the RO sumps, backwash from the microfiltration system, and blow down from the clarifiers. The freeboard measurements taken from the evaporation and collection ponds are tabulated in Table 3.1-2. The readings on the West Collection Pond are taken as either overflowing (O/F) into the East Collection Pond via a spillway or not overflowing (Not O/F). The leak detection volumes pumped for from Evaporation Ponds 2 and 3 are presented in Tables 3.1-3 through 3.1-5. These

three tables give the gallons per day per acre (GPD/AC) with values that exceed 775 GPD/AC highlighted in blue.

The tailings sump volume, collection and injection totals for the Large Tailings Pile are presented in Table 3.1-6. Injection into the LTP ceased in July 2015. The monthly collection totals broken out by aquifer and restoration area are shown in Table 3.1-7. The monthly injection totals broken out by aquifer and area are presented in Table 3.1-8. The On-Site, South Off-Site, and North Off-site injection water is a combination of San Andres water, zeolite treated water, and RO Product water. The monthly totals for the low concentration and in-situ injectate are presented in Table 3.1-9, which were not operated in the first half of 2018. The low concentration re-injection ceased operation in July of 2016.

Table 3.1-10 presents the influent totals for the active treatment systems. The inflow to the RO plant averaged 435 gpm in the first half of 2018 while the inputs to the 300 zeolite and 1200 zeolite cells were 58 and 203, respectively. Table 3.1-11 presents the total volumes of treated effluent. It also presents the regeneration and brine effluents that were discharged into Evaporation Pond 2 from the treatment systems. The fresh water injection totals from each of the three restoration areas are also presented in this table.

3.2 Reversal Wells

The depth to water measurements for the Reversal Wells are presented in Table 3.2-1. Water levels in alluvial well S5 have been used in place of well S1 for the S1-S2 reversal pair due to the effects of the nearby S injection line on water levels in well S1. Because the operation of the S injection line results in water level changes in both S1 and S2, it is necessary to monitor water levels in well S5 which is closer to the collection area in order to effectively monitor gradient reversal.

3.3 Pond and Pipeline Maintenance

No liner repair work was done in the 1st half of 2018. Slumps in the berms of Evaporation Pond 1 were found during an inspection in early 2017 and a relining of Evaporation Pond 1 is planned in 2019.
During this semi-annual reporting period, the following significant pond and pipeline maintenance activities were performed:

- Water lines servicing the B and L well fields were replaced in January with larger lines to increase production from these areas;
- Existing evaporator water lines were removed in evaporation ponds #1, #2, and #3 in April in preparation for installation of new evaporators;
- Beginning in May, new evaporators were installed in evaporation ponds #1 and #2 to enhance evaporation. Automated controls were also installed to specify operating times and limit/stop operation based on wind speed and/or temperature.

There were no discharges from conveyance pipelines to non-authorized areas during this time period.

3.4 Well Drilling and Closures

Two new San Andres wells (Deep Well #1R and Deep Well #2R) were drilled on-site during the period from January through June of 2018 as indicated in Table 3.4-1. In addition, former San Andres well #928 was plugged and abandoned in January 2018.

3.5 Facilities Inspections and Maintenance

Facilities, structures, contaminated fluid pipelines, equipment, diversion structures and diversion channels associated with groundwater treatment, and drainages were inspected during the period from January through June of 2018. Minor surface water erosion piping was identified originating on top of the LTP and down the southern side after the site received over one inch of rainfall in a five-hour period on May 21. The erosional subsurface piping channel was backfilled and the ground surface recontoured to direct runoff towards the surface runoff piping features installed for that purpose.

In addition, the following significant maintenance activities were performed:

- In January, berm repairs were made around ponds and zeolite beds to repair rill erosion. In addition, Curlex (an erosional control blanket) was placed on the northern berm on evaporation pond #1;
- Wind-blown sand from the former 100-acre southern pivot land application area was identified in the Rio San Jose channel and was excavated on June 13-14 to allow free drainage should any occur;
- Additional zeolite sand was added to the cells of the 1200 zeolite system to replace sand removed by wind scour in June 2018. After the addition and leveling of the sand, zeolite rock was placed on top of the sand to prevent future wind erosion.

4.0 WATER QUALITY MONITORING

4.1 Groundwater Quality Monitoring

Table 2-2 outlines the water quality sampling frequency and parameters monitored. In addition, the volumes of water injected and recovered as part of the ground-water cleanup program are monitored on a weekly frequency and the rates documented. A performance review report is submitted by March 31 of each year according to License Condition 35E. The groundwater monitoring data for the POC wells, as required to comply with 10 CFR 40.65, are reported in Tables 4.1-1 through 4.1-6. Two samples from background well P were collected in the first half of 2018 and are presented in Table 4.1-4. The water quality of the Point of Compliance (POC) wells is currently being restored and therefore the reported levels are not representative of steady state aquifer conditions at the present time. The concentration levels are therefore not compared to 10 CFR 20 effluent limits. A hydraulic barrier forces the water in the aquifer near these POC wells to move in the direction of the collection wells where the water is withdrawn and treated. Due to these conditions water level data on these wells are also not reflective of steady state conditions, and therefore are not reported here.

4.2 Pond Water Quality Monitoring

Table 4.2-1 presents the water quality data associated with the collection and evaporation ponds. The water quality data for the Evaporation Pond alluvial monitoring wells are presented in Table 4.2-2. This table highlights the concentrations that exceed the alluvial site standards in blue. The sulfate concentrations naturally exceed the site standard in wells DD and DD2. The TDS in well DD also exceeds the site standard. The uranium concentrations in well DD2 naturally exceed the alluvial site standard as they have since this well was drilled. The molybdenum and uranium concentrations exceeded the site standard in well DD on 4/30/18 but these values are not representative of the groundwater conditions at well DD, as indicated by the two samples collected after this sample. The 4/30/18 is likely a sample from some other well. Total concentrations for manganese, selenium, molybdenum and uranium are presented for the ponds and are generally fairly similar to the dissolved concentrations. Table 4 from the Discharge Permit DP-200 requests uranium activity as one of the analytes for monitoring but is not included because it is a calculated value from the uranium concentrations.

4.3 Treated Water Quality Monitoring

Table 4.3-1 presents the effluent water quality analysis from the Post Treatment Tank (SP2). The SP2 sample is collected after mixing of the RO product, zeolite treated and fresh water. This table also shows that all of the SP2 concentrations in the first half of 2018 were less than all of the alluvial site standards for each of these samples with the exception of two molybdenum values and one uranium value in March and April. The laboratory minimum detection concentration with a less than sign was used for the radium and thorium values when not detected at the minimum detectable concentration.

Table 4.3-2 presents the treated water quality data for the RO product (SP1) and the zeolite treated water (300Z, 1200Z Trains 1 & 2, and 1200Z Trains 3 & 4) with sample constituent concentrations that exceed the alluvial site standards highlighted in blue. All of the RO product constituent concentrations measured in the first half of 2018 were less than or equal to the corresponding alluvial site standards with the exception of two molybdenum and one uranium values. The molybdenum concentrations for the SP1 on 3/29/18 and 4/25/18 samples and the uranium concentration for 4/25/18 exceeded the standards and resulted in an exceedance in the SP2 sample after the RO product water was mixed with fresh water. An investigation of these two monthly exceedance indicate the LPRO3 was not treating properly and was turned off until the RO membranes are changed. An evaluation of the potential impacts from this exceedance was sent to the NRC on June 3, 2018.
Table 4.3-2 also presents the treated water quality for the zeolite treatment process. In the first half of 2018, zeolite was used to treat Off-site water for uranium in the 300 zeolite system and four trains in the 1200 zeolite systems. The zeolite treated water is monitored for the discharge from the 300 zeolite and Trains 1 & 2 and Trains 3 & 4 from the 1200 systems. None of the uranium concentrations or other site standards were exceeded in the first half of 2018 zeolite samples.

5.0 DIRECT RADIATION

Gamma dose rates are continuously monitored through the use of optically stimulated luminescence (OSL) dosimeter badges placed at each of the eight locations identified in Figure-1. HMC #16 is considered the background location for direct radiation. Each OSL badge consists of an aluminum oxide detector within a plastic holder. The plastic provides adequate protection from weather for these badges to be used out-of-doors. The OSL's are exchanged semi-annually and analyzed by an approved independent laboratory (currently Landauer). The levels of direct environmental radiation are recorded for each of the eight locations. Pertinent sample data are reported in Attachment 4.

6.0 SURFACE CONTAMINATION

The Occupational Monitoring Program requirements are summarized in Table 2-3. The aspects related to contamination control are discussed briefly below.

6.1 Personnel Skin and Clothing

The monitoring of personnel for alpha contamination may be required by the RSO depending on the nature of the work being performed as specified in the Radiation Protection Program (RPP) Manual (HMC, 2018), which may or may not be conducted under a radiation work permit (RWP). No releases of personnel or clothing above administrative limits were reported during this reporting period.

6.2 Survey of Equipment Prior to Release for Unrestricted Use

Equipment surveys are required for all equipment that is to be removed from Restricted Areas as specified in the RPP (HMC, 2018). Standard Operating Procedures are used for these surveys. No releases of contaminated material above NRC release criteria were reported during this reporting period.

7.0 LOWER LIMIT OF DETECTION

Homestake representatives have calculated the Lower Limit of Detection (LLD) for each measurement system, where applicable; to more accurately evaluate concentrations of radioactive material measured in the environment surrounding the mill site. The lower limit of detection is defined in U.S. Nuclear Regulatory Guide 8.30 – Appendix B as the smallest concentration of radioactive material that has a 95% probability of being detected. Radioactive material is "detected" if the value measured on an instrument is high enough to conclude that activity above the system background is probably present. Since the LLD is a function of sample volume, counting efficiency, radiochemical yield, etc., it varies for different sampling and analysis procedures.

For the individual measurement systems for which Homestake calculates LLDs, the following formula is utilized:

$$LLD = \frac{3+4.66\ S_b}{3.7\ E\ 4\ EvY \exp(-\lambda t)}$$

Where:

LLD	is the lower limit of detection (microcuries per milliliter [µCi/ml]);
S_b	is the standard deviation of the instrument background counting rate (counts per second);
3.7 E 4	is the number of disintegrations per second per microcurie;
E	is the counting efficiency (counts per disintegration);
v	is the sample volume (ml);
Y	is the fractional radiochemical yield (when applicable);
λ	is the radioactive decay constant for the particular radionuclide; and;
t	is the elapsed time between sample collection and counting

The value of S_b used in the calculation of the LLD for a particular measurement system will be based on the actual observed variance of the instrument background counting rate. The laboratory has been instructed to report the LLD for each measurement considering all of the parameters associated with the measurement system and the sample size.

The vendor laboratory that performed the analyses reported herein has documented that the LLD for air and water samples will meet or exceed the requirements in Regulatory Guide 4.14. This assumes a minimum water sample size of 1 liter and an air sample volume of 2 E 9 ml. Landauer (vendor lab) reports the LLD for radon-222. The LLDs for the constituents are:

Ra-226, Th-230 in air	1 E-16 µCi/ml
Rn-222 in air	30 pCi(d/l)
U-nat in air	1 E-16 µCi/ml
U-rad in water	2 E-10 µCi/ml
Ra-226, Th-230 in water	2 E-10 µCi/ml

Uranium is analyzed by ICP-MS methods by the current vendor laboratory. In order to determine the LLD, the laboratory has performed the analysis on a blank sample many times and uses the standard deviation of these background measurements to calculate the LLD. This LLD is specified for all analyses as long as the sample size or volume meets the minimum value.

8.0 DATA SUMMARY AND CONCLUSIONS

The summaries of Homestake's effluent monitoring program included in this submittal contain data for each of the regulated parameters released to unrestricted areas. DP-200 and 10 CFR Part 40.65 requires that Homestake submit effluent release monitoring data to the State of New Mexico and

the NRC within 60 days of the end of the six-month period ending January 1 and July 1 of each year. Homestake is submitting this report to satisfy the regulatory requirements cited above. The attachments included in this report summarize the results of the effluent monitoring activities conducted by Homestake and pertinent to the required monitoring time period.

The data collected in many of Homestake's effluent monitoring programs can be readily compared to 10 CFR Part 20 Appendix B values, not for determinations of public dose, but as a qualitative benchmark indicator for identifying effluent levels or trends that could pose a concern in terms of compliance with public dose limits given in 10 CFR 20.1301. During the report period, Homestake has not exceeded 10 CFR Part 20 values in any of their effluents covered by this report. The ground water standards for uranium and/or molybdenum were exceeded at POC wells D1 and S4 showing that additional restoration is needed in these areas. Some site standards are also exceeded in pond monitoring wells DD and DD2 as they have been historically due to natural concentrations in this upgradient area. Two molybdenum and one uranium concentrations exceeded the standards for the SP2 monitoring site as discussed earlier.

9.0 REFERENCES

Environmental Restoration Group, Inc. (ERG). 2017. Proposal to address radon flux NOV for the LTP (NRC Docket No. 040-08903/2016-001 License No. SUA-1471). In: Reply to Notice of Violation, Docket No. 040-08903/2016-001, License No. SUA-1471 [Submitted to NRC by Homestake Mining Company of California (HMC) on September 13, 2017].

Homestake Mining Company of California (HMC). 2018. Radiation Protection Program Manual, Revision 0. Homestake Grants Reclamation Project, Cibola County, New Mexico. January.

U.S. Nuclear Regulatory Commission (NRC). 2017. NRC Inspection Report 040-08903/2016-001 and Notice of Violation. April 20, 2017.

Table 2-1
Environmental Monitoring Program Excluding Groundwater Monitoring

Table 2-1 - Environmental Monitoring Program Excluding Groundwater Monitoring

Type of Sample	Number	Locations	Method	Frequency	Analytical Parameters
AIR Particulates	4	HMC-1, HMC-1A, HMC-2, HMC-3 at or near the site boundary in sectors that have the highest predicted concentrations of radioactive airborne particulates.	Continuous (High Vol.)	Weekly filter change or more frequently as required. Samples composited and analyzed quarterly.	Natural Uranium, Radium-226, Thorium-230 Vanadium
	2	HMC-4, HMC-5 at site boundary nearest occupied residences	Continuous (High Vol.)	Weekly filter change, or more frequently as required. Samples composited and analyzed quarterly.	Natural Uranium, Radium-226, Thorium-230 Vanadium
	1	HMC-6 background location	Continuous (High Vol.)	Weekly filter change, or more frequently as required. Samples composited and analyzed quarterly.	Natural Uranium, Radium-226, Thorium-230 Vanadium
Radon Gas	9	Locations described in Air - Particulates & HMC-7 on S boundary, HMC-1A near Evaporation Pond (EP-3), & HMC-16 as a background	Continuous Track-etch	Quarterly	Rn-222
DIRECT RADIATION	8	Locations described in Air - Particulates & HMC-16 as a background	OSL	Semi-Annual	Gamma Exposure Rate

Table 2-2
Groundwater Monitoring Program (8-99, as modified by Amendment 34)

Table 2-2 Groundwater Monitoring Program (8-99 as modified by Amendment 34)

Well Number	Parameters to be Monitored	Frequency of Monitoring
#1 & #2 Deepwells	D	Annually
Broadview Acres Wells 446, SUB1, SUB2, SUB3	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 B, BA, KZ, DZ, 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, SO_4, Cl, HCO_3, CO_3, Na, Ca, Mg, K, NO_3, U, Se, Mo, Ra-226
D = Ca, Mg, K, Na, HCO_3, CO_3, Cl, SO_4, pH, TDS, Al, As, Ba, Cd, Co, Cu, CN, F, Fe, Pb, Mn, Hg, Mo, Ni, NO_3 as N, Se, Ag, Zn, U, Filtered Ra-226
F = V, Ra-228, Th-230
G = Water Level, SO_4, U, Se, TDS, Mo

Table 2-3
Occupational Monitoring Program (6-00)

Table 2-3 Occupational Monitoring Program (6-00)

Type of Sample	Number	Locations	Method	Frequency	Analytical Parameters
Lapel Personal Air Sample	As required by RWP	As required by RWP (2 L/min or equivalent)	HP-1	As required by RWP	Alpha, U-Nat
Lapel Personal Air Sampler Calibration	As required by RWP	N/A	HP-1	As required by RWP	Flow rate
Release of Equipment	As required by RWP	Potentially Contaminated Equipment and Materials	HP-4	As required by RWP	Alpha, beta gamma
ALARA	N/A	As required by RPA	HP-6	N/A	As required by RPA
Respiratory Protection	As required by RWP	As required by RWP	HP-7	N/A	N/A
Bioassay	As required by RWP	As required by RWP	HP-8 after mill decommissioning; termination	Baseline, Semi-annual	U-Nat in urine
Instrument Calibration	Variable	Radiation Detection Instruments in use	HP-10	Annually	N/A
Personnel Gamma (OSL)	Variable	Personnel	HP-11	Quarterly	Gamma
Personnel Contamination	As required by RWP	As required by RWP	HP-12	As required by RWP	Alpha
Radiation Protection Training	As required	Mill Site taught by RPA (certified individual) subjects as per Reg Guide 8.31	HP-14 for people working with groundwater or physical work with tailings sand/ slimes	Initial & annual refresher	Training Class & Written Test

HP-# = Homestake procedure number; RPA = Radiation Protection Administrator;
RWP = Radiation Work Permit; OSL = Optically Stimulated Luminescence dosimeter

Tables 3.1-1 through 3.1-11
Flow Rates

Table 3.1-1. Evaporation and Collection Pond Monthly Influent Totals

Evap Pond 1

January	Interval Gallons
Transfer EP-2 to EP-1	0

February	Interval Gallons
Transfer EP-2 to EP-1	0

March	Interval Gallons
Transfer EP-2 to EP-1	0

April	Interval Gallons
Transfer EP-2 to EP-1	0

May	Interval Gallons
Transfer EP-2 to EP-1	0

June	Interval Gallons
Transfer EP-2 to EP-1	23,449,000

Evap Pond 2

January	Interval Gallons
R.O. Flow to Evaporation Ponds	3,678,328
Tailings Sumps	415,590
Tailings Pile	0
Zeolite Regeneration & Overflow	0
E Coll Pond to EP-2	856,680
February	**Interval Gallons**
R.O. Flow to Evaporation Ponds	1,148,643
Tailings Sumps	381,350
Tailings Pile	200
Zeolite Regeneration & Overflow	0
E Coll Pond to EP-2	0
March	**Interval Gallons**
R.O. Flow to Evaporation Ponds	1,883,271
Tailings Sumps	357,300
Tailings Pile	0
Zeolite Regeneration & Overflow	0
E Coll Pond to EP-2	0
April	**Interval Gallons**
R.O. Flow to Evaporation Ponds	4,448,646
Tailings Sumps	450,770
Tailings Pile	0
Zeolite Regeneration & Overflow	0
E Coll Pond to EP-2	0
May	**Interval Gallons**
R.O. Flow to Evaporation Ponds	4,465,470
Tailings Sumps	398,460
Tailings Pile	0
Zeolite Regeneration & Overflow	4,306,900
E Coll Pond to EP-2	2,003,416
June	**Interval Gallons**
R.O. Flow to Evaporation Ponds	4,383,690
Tailings Sumps	349,440
Tailings Pile	0
Zeolite Regeneration & Overflow	2,387,320
E Coll Pond to EP-2	970,712

Evap Pond 3

January	Interval Gallons
Transfer EP-1 to EP-3	0

February	Interval Gallons
Transfer EP-1 to EP-3	0

March	Interval Gallons
Transfer EP-1 to EP-3	0

April	Interval Gallons
Transfer EP-1 to EP-3	0

May	Interval Gallons
Transfer EP-1 to EP-3	0

June	Interval Gallons
Transfer EP-1 to EP-3	0

Collection Ponds

January	Interval Gallons
Miscellanous RO and Clarifier Flow	2,014,921
Tailings Sumps	0
802	170

February	Interval Gallons
Miscellanous RO and Clarifier Flow	870,588
Tailings Sumps	0
802	17,810

March	Interval Gallons
Miscellanous RO and Clarifier Flow	731,975
Tailings Sumps	0
802	120,200

April	Interval Gallons
Miscellanous RO and Clarifier Flow	1,002,628
Tailings Sumps	0
802	145,720

May	Interval Gallons
Miscellanous RO and Clarifier Flow	2,223,497
Tailings Sumps	0
802	123,400

June	Interval Gallons
Miscellanous RO and Clarifier Flow	1,577,854
Tailings Sumps	0
802	94,780

Table 3.1-2. Evaporation and Collection Pond Weekly Freeboard Measurements (feet)

	EP1	EP2	EP3A	EP3B	W Coll	E Coll
1/1/2018	4.1	6.9	-	-	O/F	4.25
1/8/2018	4.7	5.78	5.8	5.9	O/F	4.58
1/15/2018	4.2	5.45	-	-	O/F	4.3
1/22/2018	5	5.18	5.1	5	O/F	4
1/29/2018	5	5.15	5.2	5.15	O/F	3.5
2/5/2018	4.5	5.06	5.5	5	O/F	3.72
2/12/2018	4.6	5.13	5.2	5.15	O/F	3.9
2/20/2018	4.6	4.98	5.55	5	O/F	3.86
2/26/2018	4.97	5.03	5.5	5.3	O/F	3.82
3/5/2018	4.7	4.77	5.4	5.35	O/F	3.9
3/12/2018	6	4.78	5.25	5.3	O/F	3.87
3/19/2018	5.5	4.72	5.4	5.35	O/F	3.9
3/26/2018	5.5	4.72	5.45	5.45	O/F	4.1
4/2/2018	6	4.97	5.55	5.5	O/F	3.6
4/9/2018	6	4.65	5.8	5.65	O/F	3.7
4/16/2018	5.75	4.5	5.8	5.75	O/F	3.61
4/23/2018	5.75	4.44	5.95	5.95	O/F	3.7
4/30/2018	6	4.43	6	6	O/F	3.6
5/7/2018	6.5	4.25	6.3	6.3	O/F	4.54
5/14/2018	7	3.9	6.4	6.3	O/F	3.6
5/21/2018	6.5	3.3	6.45	6.3	O/F	4.6
5/28/2018	7.5	2.92	6.5	6.5	O/F	4.5
6/4/2018	6	4.1	6.65	6.55	O/F	4.49
6/11/2018	3.8	5.2	6.88	6.82	O/F	4.21
6/18/2018	3.5	6.63	6.89	6.81	O/F	4.15
6/25/2018	3.8	6.41	7.2	7.1	O/F	4.09

Note: O/F = Overflowing to East Collection.
Not O/F = Not Overflowing to East Collection.

Table 3.1-3. Evaporation Pond 2 Leak Detection

Date	No. 1			No. 2			No. 3			No. 4			No. 5		
	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC
Previous Reading	108,170			795,900			324,630			1,054,720			351,380		
1/1/2018	108,170	0	0	795,900	0	0	324,630	0	0	1,054,960	240	10	351,380	0	0
1/8/2018	108,170	0	0	795,900	0	0	324,630	0	0	1,056,300	1,340	54	351,380	0	0
1/15/2018	108,170	0	0	795,900	0	0	324,630	0	0	1,057,270	970	39	351,380	0	0
1/22/2018	108,170	0	0	825,560	29,660	**1,345**	330,840	6,210	232	1,058,350	1,080	44	351,380	0	0
1/29/2018	108,170	0	0	825,560	0	0	330,840	0	0	1,058,350	0	0	351,380	0	0
2/5/2018	108,170	0	0	825,560	0	0	330,840	0	0	1,058,350	0	0	351,380	0	0
2/12/2018	108,170	0	0	825,580	20	1	330,840	0	0	1,058,350	0	0	351,380	0	0
2/20/2018	108,170	0	0	825,580	0	0	330,840	0	0	1,058,350	0	0	351,380	0	0
2/26/2018	108,170	0	0	825,580	0	0	330,840	0	0	1,058,350	0	0	351,380	0	0
3/5/2018	108,170	0	0	825,580	0	0	330,840	0	0	1,058,350	0	0	351,380	0	0
3/12/2018	108,170	0	0	825,590	10	0	330,840	0	0	1,059,400	1,050	42	351,380	0	0
3/19/2018	108,170	0	0	847,570	21,980	**997**	330,840	0	0	1,059,410	10	0	351,380	0	0
3/26/2018	108,170	0	0	847,580	10	0	330,840	0	0	1,059,410	0	0	351,380	0	0
4/2/2018	108,170	0	0	847,870	290	13	330,840	0	0	1,059,410	0	0	351,380	0	0
4/9/2018	108,170	0	0	922,000	74,130	**3,362**	330,840	0	0	1,059,410	0	0	351,380	0	0
4/16/2018	108,170	0	0	976,560	54,560	**2,474**	331,460	620	23	1,059,410	0	0	351,380	0	0
4/23/2018	108,170	0	0	1,046,870	70,310	**3,189**	363,210	31,750	**1,187**	1,059,410	0	0	351,380	0	0
4/30/2018	108,170	0	0	1,071,910	25,040	**1,136**	363,210	0	0	1,059,410	0	0	351,380	0	0
5/7/2018	108,170	0	0	1,102,120	30,210	**1,370**	363,210	0	0	1,059,410	0	0	351,380	0	0
5/14/2018	108,170	0	0	1,102,150	30	1	363,210	0	0	1,059,410	0	0	351,380	0	0
5/21/2018	108,170	0	0	1,102,160	10	0	363,220	10	0	1,059,410	0	0	351,380	0	0
5/28/2018	108,170	0	0	1,102,160	0	0	364,100	880	33	1,059,410	0	0	351,380	0	0
6/4/2018	108,170	0	0	1,102,180	20	1	364,110	10	0	1,059,410	0	0	351,380	0	0
6/11/2018	108,170	0	0	1,102,200	20	1	364,100	-10	0	1,059,410	0	0	351,380	0	0
6/18/2018	108,170	0	0	1,102,200	0	0	364,100	0	0	1,059,410	0	0	351,380	0	0
6/25/2018	108,170	0	0	1,102,300	100	5	364,100	0	0	1,059,410	0	0	351,380	0	0

NOTE: Totalizer readings that result in minor positive or negative volumes should not be given any significance. No.4 Sump was installed backwards in early October and corrected in
GPD/AC = Gallons per day per acre; those that exeed 775 are in bold.

Table 3.1-4. Evaporation Pond 3A Leak Detection

Cell A Sumps	A-1			A-2			A-3			A-4			A-5		
	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC
Previous Reading	70			229,220			303,160			29,990			336,400		
1/1/2018															
1/8/2018	70			229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
1/15/2018															
1/22/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
1/29/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
2/5/2018	70	0	0	229,220	0	0	303,160	0	0	29,980	-10	-1	336,400	0	0
2/12/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	10	1	336,400	0	0
2/20/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
2/26/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
3/5/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
3/12/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
3/19/2018	70	0	0	229,220	0	0	303,160	0	0	29,990	0	0	336,400	0	0
3/26/2018	70	0	0	229,230	10	1	303,160	0	0	29,990	0	0	336,400	0	0
4/2/2018	70	0	0	229,240	10	1	303,160	0	0	29,990	0	0	336,400	0	0
4/9/2018	70	0	0	229,240	0	0	303,160	0	0	29,990	0	0	336,400	0	0
4/16/2018	70	0	0	229,240	0	0	303,160	0	0	29,990	0	0	336,400	0	0
4/23/2018	70	0	0	229,240	0	0	303,160	0	0	29,990	0	0	336,400	0	0
4/30/2018	70	0	0	229,240	0	0	303,160	0	0	29,990	0	0	336,400	0	0
5/7/2018	70	0	0	229,250	10	1	303,160	0	0	29,990	0	0	336,400	0	0
5/14/2018	70	0	0	229,250	0	0	303,160	0	0	29,990	0	0	336,400	0	0
5/21/2018	70	0	0	229,250	0	0	303,160	0	0	29,990	0	0	336,400	0	0
5/28/2018	70	0	0	229,250	0	0	303,160	0	0	29,990	0	0	336,400	0	0
6/4/2018	70	0	0	229,250	0	0	303,160	0	0	29,990	0	0	336,400	0	0
6/11/2018	70	0	0	229,250	0	0	303,160	0	0	29,990	0	0	336,400	0	0
6/18/2018	70	0	0	229,250	0	0	303,160	0	0	29,990	0	0	336,400	0	0
6/25/2018	70	0	0	229,250	0	0	303,160	0	0	29,990	0	0	336,400	0	0

NOTE: Totalizer readings that result in minor positive or negative volumes should not be given any significance
GPD/AC = Gallons per day per acre; those that exeed 775 are in bold.

Table 3.1-5. Evaporation Pond 3B Leak Detection

Cell B Sumps	B-1			B-2			B-3			B-4			B-5		
	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC	Reading	Gallons	GPD/AC
Previous Reading	30,970			463,770			1,263,680			83,630			366,050		
1/1/2018															
1/8/2018	30,970	0	0	470,900	2,130	59	1,388,340	124,660	3,451	83,630	0	0	366,050	0	0
1/15/2018															
1/22/2018	30,970	0	0	475,950	5,050	140	1,388,340	0	0	83,630	0	0	370,130	4,080	113
1/29/2018	30,970	0	0	475,950	0	0	1,388,340	0	0	83,630	0	0	399,810	29,680	1,643
2/5/2018	30,970	0	0	475,950	0	0	1,388,340	0	0	83,630	0	0	419,890	20,080	1,112
2/12/2018	30,970	0	0	475,950	0	0	1,388,340	0	0	83,630	0	0	440,330	20,440	1,132
2/20/2018	38,580	7,610	421	475,950	0	0	1,388,340	0	0	129,750	46,120	2,554	443,780	3,450	191
2/26/2018	40,610	2,030	112	475,950	0	0	1,388,340	0	0	176,380	46,630	2,582	443,780	0	0
3/5/2018	40,610	0	0	480,210	4,260	236	1,403,970	15,630	865	208,870	32,490	1,799	443,780	0	0
3/12/2018	40,610	0	0	482,400	2,190	121	1,412,190	8,220	455	233,750	24,880	1,378	443,780	0	0
3/19/2018	40,620	10	1	484,400	2,000	111	1,412,190	0	0	238,480	4,730	262	443,780	0	0
3/26/2018	40,630	10	1	486,190	1,790	99	1,412,200	10	1	246,050	7,570	419	443,780	0	0
4/2/2018	40,640	10	1	488,970	2,780	154	1,412,210	10	1	249,390	3,340	185	443,780	0	0
4/9/2018	40,650	10	1	492,080	3,110	172	1,412,210	0	0	254,720	5,330	295	443,790	10	1
4/16/2018	40,650	0	0	494,480	2,400	133	1,412,220	10	1	260,980	6,260	347	443,790	0	0
4/23/2018	40,650	0	0	496,440	1,960	109	1,412,220	0	0	264,100	3,120	173	443,790	0	0
4/30/2018	40,650	0	0	498,330	1,890	105	1,412,220	0	0	267,400	3,300	183	443,790	0	0
5/7/2018	40,650	0	0	499,800	1,470	81	1,412,220	0	0	270,650	3,250	180	443,790	0	0
5/14/2018	40,650	0	0	501,630	1,830	101	1,412,220	0	0	273,140	2,490	138	443,790	0	0
5/21/2018	40,670	20	1	504,310	2,680	148	1,414,640	2,420	134	279,900	6,760	374	443,790	0	0
5/28/2018	47,700	7,030	389	508,620	4,310	239	1,414,850	210	12	285,300	5,400	299	443,790	0	0
6/4/2018	51,750	4,050	224	508,620	0	0	1,415,020	170	9	286,450	1,150	64	443,790	0	0
6/11/2018	52,970	1,220	68	508,620	0	0	1,415,020	0	0	286,450	0	0	443,800	10	1
6/18/2018	52,980	10	1	508,620	0	0	1,415,020	0	0	286,470	20	1	443,800	0	0
6/25/2018	52,980	0	0	508,620	0	0	1,415,030	10	1	286,480	10	1	447,800	4,000	221

NOTE: Totalizer readings that result in minor positive or negative volumes should not be given any significance.
GPD/AC = Gallons per day per acre; those that exeed 775 are in bold.
= Pump Maintenance; pumps off line.

Table 3.1-6. Monthly Tailings Collection and Injection Totals

	Sumps (gallons)	Dewatering (gallons)	Injection (gallons)
January	415,590	0	0
February	381,350	0	0
March	357,300	0	0
April	450,770	0	0
May	398,460	0	0
June	349,440	0	0

Table 3.1-7. Monthly Collection Totals by Aquifer and Area (gallons)

	On-Site Collection			South Off-Site Collection				North Off-Site Collection
	Alluvial	Upper Chinle	Middle Chinle	Alluvial	Upper Chinle	Middle Chinle	Lower Chinle	Alluvial
January	12,630,230	7,104,420	1,784,000	12,516,675	0	3,384,325	0	11,647,000
February	5,632,940	3,897,370	1,386,700	3,786,170	0	894,830	0	9,068,000
March	6,507,748	4,366,100	1,260,400	-9,120	0	-7,880	0	230,000
April	11,559,775	8,123,141	1,831,500	18,650	0	-32,650	0	67,000
May	10,652,423	6,046,611	1,426,800	2,443,868	0	1,050,780	0	5,030,000
June	14,240,773	6,531,619	799,400	4,152,930	0	3,153,070	0	1,250,000

Table 3.1-8. Monthly Injection Totals by Aquifer and Area (gallons)

	On-Site Injection			South Off-Site Injection				North Off-Site Injection
	Alluvial	Upper Chinle	Middle Chinle	Alluvial	Upper Chinle	Middle Chinle	Lower Chinle	Alluvial
January	31,884,160	879,230	10,500	11,107,656	0	949,870	0	21,528,600
February	8,591,232	105,400	83,260	6,535,490	0	686,010	0	13,423,200
March	1,828,608	118,880	138,680	4,374,040	0	290,560	0	12,833,400
April	6,165,952	1,102,339	187,470	6,403,377	0	1,036,123	0	14,135,100
May	4,369,856	1,104,080	142,970	5,314,215	0	860,285	0	9,741,000
June	13,766,592	548,390	103,060	5,119,005	0	1,117,695	0	13,740,700

Table 3.1-9. Monthly Totals of Low-concentration and In-situ Injectate (gallons)

	L well Collection for Reinjection	*In-situ* Injection
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0

Table 3.1-10. Treatment System Influents Monthly Totals (gallons)

	300 GPM Zeolite	1200 GPM Zeolite	RO Plant
January	4,172,100	26,835,000	23,273,568
February	0	13,523,400	11,884,192
March	573,835	10,540	13,205,218
April	3,829,848	-40	23,512,636
May	3,291,648	4,306,900	19,821,514
June	3,176,993	8,123,200	23,691,574

Table 3.1-11. Treatment System Effluent and Fresh Water Monthly Totals (gallons)

	Treatment Systems				Fresh Water Injection		
	Zeolite		RO Plant				
	Treated	Regeneration	Treated	Brine	On-Site	South Off-Site	North Off-Site
January	31,007,100	0	17,580,319	3,678,328	8,490,303	3,969,299	4,518,734
February	13,523,400	0	9,864,961	1,148,643	6,108,210	2,151,891	3,999,899
March	584,375	0	10,589,972	1,883,271	4,734,157	3,025,362	10,130,481
April	3,829,808	0	18,061,362	4,448,646	6,885,942	2,956,931	6,696,127
May	3,291,648	4,306,900	13,132,547	4,465,470	5,621,003	2,749,825	4,338,172
June	8,912,873	2,387,320	17,730,030	4,383,690	6,505,118	1,397,003	3,077,878

Table 3.2-1
Reversal Wells

Table 3.2-1. Depth to Water in Reversal Wells

Well Name	B	BA	DZ	KZ	S2	S5	SM	SN	SO	SP
MP Elev.	6570.9	6571.58	6590.53	6571.72	6573.72	6574.69	6578.74	6579.26	6578.79	6578.66
1/1/2018	35.65	38.83	53.17	33.19	38.01	42.86	40.27	40.49	41.03	41
1/8/2018	35.95	33.26	54.8	34	37.1	42.72	40.24	40.4	40.93	40.98
1/15/2018	36.67	39.58	48.10	34.64	37.18	43.78	40.91	41.15	41.70	41.73
1/22/2018	35.80	37.56	47.21	33.74	40.07	42.70	40.18	40.35	40.87	40.01
1/29/2018	35.84	37.62	52.45	33.80	37.04	42.60	40.10	40.27	40.75	40.75
2/5/2018	35.60	37.10	51.90	34.20	37.00	42.50	40.10	40.15	40.70	40.50
2/12/2018	36.00	37.51	51.64	34.20	37.20	42.25	40.10	40.20	40.81	40.74
2/20/2018	36.15	37.70	51.48	34.24	37.22	42.40	40.13	40.22	40.85	40.75
2/26/2018	36.22	37.25	51.48	34.12	37.38	42.14	40.25	40.31	41.01	40.71
3/5/2018	37.41	36.34	51.36	34.51	37.84	42.69	40.51	40.60	41.29	41.04
3/12/2018	36.51	37.66	48.10	34.67	40.88	43.15	40.96	40.88	41.20	41.45
3/19/2018	36.42	37.52	51.62	34.51	37.98	42.97	40.79	40.78	41.61	42.86
3/26/2018	36.44	36.52	51.84	34.45	37.48	32.29	40.74	40.59	42.08	41.21
4/2/2018	36.41	37.80	52.69	34.35	38.05	43.10	40.85	40.86	41.69	41.42
4/9/2018	36.73	37.70	51.32	34.60	38.22	43.00	41.05	41.03	41.87	41.70
4/16/2018	36.70	37.60	51.05	34.45	38.38	43.19	41.10	41.09	41.95	41.66
4/23/2018	36.85	38.78	53.21	33.96	38.47	43.47	41.30	40.81	42.08	41.80
4/30/2018	36.98	38.59	51.75	34.10	38.45	43.20	41.25	40.69	42.05	41.82
5/7/2018	40.76	38.65	55.02	35.31	39.24	23.06	41.64	41.86	42.86	42.02
5/14/2018	40.63	41.44	51.56	38.33	42.39	45.36	46.91	45.18	47.36	47.69
5/21/2018	43.04	42.76	52.4	39.49	39.55	44.69	42.75	42.1	42.98	39.84
5/28/2018	37.10	39.20	54.29	34.15	38.98	43.90	41.88	41.30	42.61	42.25
6/4/2018	36.91	39.21	53.96	34.34	38.81	44.02	41.74	41.65	42.6	42.31
6/11/2018	37.68	39.41	49.41	34.42	37.73	44	43.81	43.76	42.64	43.64
6/18/2018	37.1	39.6	54.72	34.04	38.7	44.03	41.9	41.85	42.6	42.94
6/25/2018	37.4	39.95	54.8	34.25	38.84	43.95	43.95	41.46	42.6	42.5

Table 3.4-1
Wells Drilled and Abandoned

Table 3.4-1. Wells Drilled and Abandoned

Well Name	Restoration Area
Deep Well #1R	On-Site
Deep Well #2R	On-Site

Wells Abandoned

Well Name	Restoration Area
928	North of LTP

Table 4.1-1
Water Quality Analysis for Well D1

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18030240-003
Client Sample ID: D1

Report Date: 03/15/18
Collection Date: 03/05/18 09:49
Date Received: 03/08/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
007 Chloride	150	mg/L		1		E300.0	03/14/18 00:31 / ljl
108 Sulfate	697	mg/L	D	2		E300.0	03/14/18 00:31 / ljl
PHYSICAL PROPERTIES							
010 Solids, Total Dissolved TDS @ 180 C	1660	mg/L	D	20		A2540 C	03/09/18 11:57 / jeu
METALS, DISSOLVED							
036 Molybdenum	2.56	mg/L		0.03		E200.8	03/12/18 15:20 / eli-b
040 Selenium	0.052	mg/L		0.005		E200.8	03/12/18 15:20 / eli-b
015 Uranium	1.75	mg/L		0.0003		E200.8	03/12/18 15:20 / eli-b
244 Uranium Precision (±)	0.283	mg/L		0.00005		E200.8	03/12/18 15:20 / eli-b
113 Uranium, Activity	1.2E-06	uCi/mL		2.0E-10		E200.8	03/12/18 15:20 / eli-b
114 Uranium, Activity precision (±)	1.9E-07	uCi/mL		3.0E-11		E200.8	03/12/18 15:20 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18030669-007
Client Sample ID: D1

Revised Date: 04/23/18
Report Date: 04/05/18
Collection Date: 03/22/18 08:45
Date Received: 03/23/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
175 Alkalinity, Total as CaCO3	356	mg/L		5		A2320 B	03/25/18 00:10 / mvr
206 Carbonate as CO3	<5	mg/L		5		A2320 B	03/25/18 00:10 / mvr
505 Bicarbonate as HCO3	434	mg/L		5		A2320 B	03/25/18 00:10 / mvr
007 Chloride	165	mg/L		1		E300.0	03/28/18 01:19 / ljl
031 Fluoride	0.4	mg/L	D	0.2		E300.0	03/28/18 01:19 / ljl
108 Sulfate	769	mg/L	D	2		E300.0	03/28/18 01:19 / ljl
001 Calcium	183	mg/L		1		E200.7	03/28/18 18:23 / eli-b
002 Magnesium	43	mg/L		1		E200.7	03/28/18 18:23 / eli-b
003 Potassium	4	mg/L		1		E200.7	03/28/18 18:23 / eli-b
004 Sodium	335	mg/L		1		E200.7	03/28/18 18:23 / eli-b
NON-METALS							
072 Organic Carbon, Dissolved (DOC)	1.3	mg/L		0.5		A5310 C	03/28/18 17:21 / dmb
Sulfide	0.006	mg/L	JH	0.04		A4500-S D	03/29/18 12:23 / eli-b
NUTRIENTS							
310 Nitrogen, Nitrate+Nitrite as N	1.48	mg/L		0.01		E353.2	03/26/18 15:23 / dmb
138 Nitrogen, Ammonia as N	<0.05	mg/L		0.05		A4500-NH3 G	03/27/18 11:51 / dmb
METALS, DISSOLVED							
022 Aluminum	0.0012	mg/L	J	0.03		E200.8	03/28/18 15:09 / eli-b
032 Iron	0.007	mg/L	J	0.02		E200.8	03/28/18 15:09 / eli-b
034 Manganese	0.003	mg/L		0.001		E200.8	03/28/18 15:09 / eli-b
036 Molybdenum	2.66	mg/L		0.001		E200.8	03/28/18 15:09 / eli-b
069 Phosphorus	<0.1	mg/L		0.1		E200.7	04/18/18 15:11 / eli-b
040 Selenium	0.061	mg/L		0.001		E200.8	03/28/18 15:09 / eli-b
080 Silica	23.9	mg/L		0.2		E200.8	03/28/18 15:09 / eli-b
015 Uranium	1.97	mg/L		0.0003		E200.8	03/28/18 15:09 / eli-b
042 Vanadium	0.003	mg/L	J	0.01		E200.8	03/28/18 15:09 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

Table 4.1-2
Water Quality Analysis for Well DD

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18020133-004
Client Sample ID: DD_20180202

Report Date: 03/05/18
Collection Date: 02/02/18 07:45
Date Received: 02/06/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
007 Chloride	72	mg/L		1		E300.0	02/09/18 16:05 / ljl
108 Sulfate	2050	mg/L	D	4		E300.0	02/09/18 16:05 / ljl
PHYSICAL PROPERTIES							
010 Solids, Total Dissolved TDS @ 180 C	3410	mg/L	D	40		A2540 C	02/07/18 18:48 / mvr
METALS, DISSOLVED							
036 Molybdenum	<0.03	mg/L		0.03		E200.8	02/09/18 23:39 / eli-b
040 Selenium	0.089	mg/L		0.005		E200.8	02/09/18 23:39 / eli-b
015 Uranium	0.113	mg/L		0.0003		E200.8	02/09/18 23:39 / eli-b
244 Uranium Precision (±)	0.0183	mg/L		0.00005		E200.8	02/09/18 23:39 / eli-b
113 Uranium, Activity	7.7E-08	uCi/mL		2.0E-10		E200.8	02/09/18 23:39 / eli-b
114 Uranium, Activity precision (±)	1.2E-08	uCi/mL		3.0E-11		E200.8	02/09/18 23:39 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18030669-009
Client Sample ID: DD

Revised Date: 04/23/18
Report Date: 04/05/18
Collection Date: 03/21/18 13:00
Date Received: 03/23/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS								
175	Alkalinity, Total as CaCO3	244	mg/L		5		A2320 B	03/25/18 00:26 / mvr
206	Carbonate as CO3	<5	mg/L		5		A2320 B	03/25/18 00:26 / mvr
505	Bicarbonate as HCO3	297	mg/L		5		A2320 B	03/25/18 00:26 / mvr
007	Chloride	77	mg/L		1		E300.0	03/28/18 01:56 / ljl
031	Fluoride	0.5	mg/L	D	0.5		E300.0	03/28/18 01:56 / ljl
108	Sulfate	2230	mg/L	D	4		E300.0	03/28/18 01:56 / ljl
001	Calcium	485	mg/L		1		E200.7	03/28/18 18:31 / eli-b
002	Magnesium	112	mg/L		1		E200.7	03/28/18 18:31 / eli-b
003	Potassium	7	mg/L		1		E200.7	03/28/18 18:31 / eli-b
004	Sodium	399	mg/L		1		E200.7	03/28/18 18:31 / eli-b
NON-METALS								
072	Organic Carbon, Dissolved (DOC)	2.4	mg/L		0.5		A5310 C	03/28/18 18:30 / dmb
	Sulfide	0.006	mg/L	JH	0.04		A4500-S D	03/29/18 12:23 / eli-b
NUTRIENTS								
310	Nitrogen, Nitrate+Nitrite as N	12.5	mg/L	D	0.1		E353.2	03/26/18 15:26 / dmb
138	Nitrogen, Ammonia as N	0.014	mg/L	J	0.05		A4500-NH3 G	03/27/18 11:53 / dmb
METALS, DISSOLVED								
022	Aluminum	0.002	mg/L	J	0.03		E200.8	03/28/18 15:20 / eli-b
032	Iron	0.003	mg/L	J	0.02		E200.8	03/28/18 15:20 / eli-b
034	Manganese	0.415	mg/L		0.001		E200.8	03/28/18 15:20 / eli-b
036	Molybdenum	0.005	mg/L		0.001		E200.8	03/28/18 15:20 / eli-b
069	Phosphorus	<0.4	mg/L	D	0.4		E200.7	03/28/18 18:31 / eli-b
040	Selenium	0.082	mg/L		0.001		E200.8	03/28/18 15:20 / eli-b
080	Silica	15.8	mg/L		0.2		E200.8	03/28/18 15:20 / eli-b
015	Uranium	0.112	mg/L		0.0003		E200.8	03/28/18 15:20 / eli-b
042	Vanadium	<0.01	mg/L		0.01		E200.8	03/28/18 15:20 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18050055-002
Client Sample ID: DD

Report Date: 05/30/18
Collection Date: 04/30/18 10:52
Date Received: 05/01/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
175 Alkalinity, Total as CaCO3	322	mg/L		5		A2320 B	05/02/18 11:59 / ljl
206 Carbonate as CO3	<5	mg/L		5		A2320 B	05/02/18 11:59 / ljl
505 Bicarbonate as HCO3	392	mg/L		5		A2320 B	05/02/18 11:59 / ljl
007 Chloride	139	mg/L		1		E300.0	05/03/18 15:01 / ljl
108 Sulfate	728	mg/L	D	2		E300.0	05/03/18 15:01 / ljl
001 Calcium	198	mg/L		0.5		E200.7	05/05/18 11:25 / eli-b
003 Potassium	3.7	mg/L	D	0.7		E200.7	05/09/18 01:31 / eli-b
004 Sodium	316	mg/L		0.5		E200.7	05/07/18 19:57 / eli-b
PHYSICAL PROPERTIES							
009 pH	7.33	s.u.	H	0.01		A4500-H B	05/02/18 11:29 / ljl
pH Measurement Temp	17	°C				A4500-H B	05/02/18 11:29 / ljl
010 Solids, Total Dissolved TDS @ 180 C	1700	mg/L	D	20		A2540 C	05/02/18 15:19 / mvr
NUTRIENTS							
310 Nitrogen, Nitrate+Nitrite as N	1.2	mg/L		0.1		E353.2	05/03/18 11:07 / dmb
METALS, DISSOLVED							
034 Manganese	0.002	mg/L		0.001		E200.8	05/04/18 23:53 / eli-b
036 Molybdenum	1.57	mg/L		0.001		E200.8	05/04/18 23:53 / eli-b
040 Selenium	0.050	mg/L		0.001		E200.8	05/04/18 23:53 / eli-b
015 Uranium	1.50	mg/L		0.0003		E200.8	05/04/18 23:53 / eli-b
244 Uranium Precision (±)	0.243	mg/L		0.00005		E200.8	05/04/18 23:53 / eli-b
113 Uranium, Activity	1.0E-06	uCi/mL		2.0E-10		E200.8	05/04/18 23:53 / eli-b
114 Uranium, Activity precision (±)	1.6E-07	uCi/mL		3.0E-11		E200.8	05/04/18 23:53 / eli-b
042 Vanadium	<0.01	mg/L		0.01		E200.8	05/04/18 23:53 / eli-b
RADIONUCLIDES, DISSOLVED							
045 Radium 226	0.2	pCi/L				E903.0	05/14/18 10:51 / arh
245 Radium 226 precision (±)	0.1	pCi/L				E903.0	05/14/18 10:51 / arh
Radium 226 MDC	0.2	pCi/L				E903.0	05/14/18 10:51 / arh
256 Radium 226 altu	2.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
258 Radium 226 altu precision (±)	1.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
Radium 226 altu MDC	2.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
057 Radium 228	1.2	pCi/L				RA-05	05/08/18 09:11 / plj
257 Radium 228 precision (±)	0.6	pCi/L				RA-05	05/08/18 09:11 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	05/08/18 09:11 / plj
359 Radium 228 altu	1.0E-09	uCi/mL				RA-05	05/08/18 09:11 / plj
360 Radium 228 altu precision (±)	6.0E-10	uCi/mL				RA-05	05/08/18 09:11 / plj
Radium 228 altu MDC	1.0E-09	uCi/mL				RA-05	05/08/18 09:11 / plj
048 Thorium 230	0.3	pCi/L				E908.0	05/23/18 08:42 / cnh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18050055-002
Client Sample ID: DD

Report Date: 05/30/18
Collection Date: 04/30/18 10:52
Date Received: 05/01/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, DISSOLVED								
248	Thorium 230 precision (±)	0.2	pCi/L				E908.0	05/23/18 08:42 / cnh
	Thorium 230 MDC	0.2	pCi/L				E908.0	05/23/18 08:42 / cnh
362	Thorium 230 altu	3.0E-10	uCi/mL				E908.0	05/23/18 08:42 / cnh
363	Thorium 230 altu precision (±)	2.0E-10	uCi/mL				E908.0	05/23/18 08:42 / cnh
	Thorium 230 altu MDC	2.0E-10	uCi/mL				E908.0	05/23/18 08:42 / cnh
DATA QUALITY								
079	Solids, Total Dissolved - Calculated	1600	mg/L				A1030 E	05/10/18 08:54 / tjp
192	A/C Balance	2.40	%				A1030 E	05/10/18 08:54 / tjp
194	Anions	25.6	meq/L				A1030 E	05/10/18 08:54 / tjp
195	Cations	26.9	meq/L				A1030 E	05/10/18 08:54 / tjp
200	TDS Ratio	1.05	unitless				A1030 E	05/10/18 08:54 / tjp

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18060025-001
Client Sample ID: DD

Report Date: 06/25/18
Collection Date: 05/31/18 10:10
Date Received: 06/01/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
175 Alkalinity, Total as CaCO3	260	mg/L		5		A2320 B	06/04/18 15:45 / ljl
206 Carbonate as CO3	<5	mg/L		5		A2320 B	06/04/18 15:45 / ljl
505 Bicarbonate as HCO3	318	mg/L		5		A2320 B	06/04/18 15:45 / ljl
007 Chloride	73	mg/L		1		E300.0	06/05/18 22:24 / ljl
108 Sulfate	2170	mg/L	D	4		E300.0	06/05/18 01:32 / ljl
001 Calcium	485	mg/L	D	0.7		E200.7	06/07/18 15:39 / eli-b
002 Magnesium	112	mg/L		0.5		E200.7	06/07/18 15:39 / eli-b
003 Potassium	7	mg/L	D	1		E200.7	06/07/18 15:39 / eli-b
004 Sodium	402	mg/L	D	2		E200.7	06/07/18 15:39 / eli-b
PHYSICAL PROPERTIES							
009 pH	7.30	s.u.	H	0.01		A4500-H B	06/04/18 12:01 / ljl
pH Measurement Temp	12	°C				A4500-H B	06/04/18 12:01 / ljl
010 Solids, Total Dissolved TDS @ 180 C	3530	mg/L	D	40		A2540 C	06/04/18 15:50 / mvr
NUTRIENTS							
310 Nitrogen, Nitrate+Nitrite as N	13.0	mg/L		0.1		E353.2	06/04/18 11:36 / dmb
METALS, DISSOLVED							
034 Manganese	0.414	mg/L		0.001		E200.8	06/06/18 11:32 / eli-b
036 Molybdenum	0.002	mg/L		0.001		E200.8	06/06/18 11:32 / eli-b
040 Selenium	0.089	mg/L		0.001		E200.8	06/06/18 11:32 / eli-b
015 Uranium	0.104	mg/L		0.0003		E200.8	06/06/18 11:32 / eli-b
244 Uranium Precision (±)	0.0169	mg/L		0.00005		E200.8	06/06/18 11:32 / eli-b
113 Uranium, Activity	7.1E-08	uCi/mL		2.0E-10		E200.8	06/06/18 11:32 / eli-b
114 Uranium, Activity precision (±)	1.1E-08	uCi/mL		3.0E-11		E200.8	06/06/18 11:32 / eli-b
042 Vanadium	<0.01	mg/L		0.01		E200.8	06/06/18 11:32 / eli-b
RADIONUCLIDES, DISSOLVED							
045 Radium 226	0.2	pCi/L	U			E903.0	06/20/18 13:33 / arh
245 Radium 226 precision (±)	0.1	pCi/L				E903.0	06/20/18 13:33 / arh
Radium 226 MDC	0.2	pCi/L				E903.0	06/20/18 13:33 / arh
256 Radium 226 altu	2.0E-10	uCi/mL	U			E903.0	06/22/18 14:47 / dmf
258 Radium 226 altu precision (±)	1.0E-10	uCi/mL				E903.0	06/22/18 14:47 / dmf
Radium 226 altu MDC	2.0E-10	uCi/mL				E903.0	06/22/18 14:47 / dmf
057 Radium 228	2.7	pCi/L				RA-05	06/15/18 14:16 / plj
257 Radium 228 precision (±)	1.0	pCi/L				RA-05	06/15/18 14:16 / plj
Radium 228 MDC	1.5	pCi/L				RA-05	06/15/18 14:16 / plj
359 Radium 228 altu	2.7E-09	uCi/mL				RA-05	06/22/18 14:47 / dmf
360 Radium 228 altu precision (±)	1.0E-09	uCi/mL				RA-05	06/22/18 14:47 / dmf
Radium 228 altu MDC	1.5E-09	uCi/mL				RA-05	06/22/18 14:47 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18060025-001
Client Sample ID: DD

Report Date: 06/25/18
Collection Date: 05/31/18 10:10
Date Received: 06/01/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, DISSOLVED								
048	Thorium 230	0.07	pCi/L	U			E908.0	06/21/18 11:24 / cnh
248	Thorium 230 precision (±)	0.08	pCi/L				E908.0	06/21/18 11:24 / cnh
	Thorium 230 MDC	0.1	pCi/L				E908.0	06/21/18 11:24 / cnh
362	Thorium 230 altu	7.0E-11	uCi/mL	U			E908.0	06/22/18 15:49 / dmf
363	Thorium 230 altu precision (±)	8.0E-11	uCi/mL				E908.0	06/22/18 15:49 / dmf
	Thorium 230 altu MDC	1.0E-10	uCi/mL				E908.0	06/22/18 15:49 / dmf
DATA QUALITY								
079	Solids, Total Dissolved - Calculated	3500	mg/L				A1030 E	06/08/18 13:32 / tla
192	A/C Balance	-2.20	%				A1030 E	06/08/18 13:32 / tla
194	Anions	53.4	meq/L				A1030 E	06/08/18 13:32 / tla
195	Cations	51.1	meq/L				A1030 E	06/08/18 13:32 / tla
200	TDS Ratio	1.02	unitless				A1030 E	06/08/18 13:32 / tla

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18060844-004
Client Sample ID: DD

Report Date: 07/17/18
Collection Date: 06/21/18 07:41
Date Received: 06/22/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS								
175	Alkalinity, Total as CaCO3	270	mg/L		5		A2320 B	06/25/18 13:58 / ljl
206	Carbonate as CO3	<5	mg/L		5		A2320 B	06/25/18 13:58 / ljl
505	Bicarbonate as HCO3	329	mg/L		5		A2320 B	06/25/18 13:58 / ljl
007	Chloride	73	mg/L		1		E300.0	06/26/18 15:00 / ljl
031	Fluoride	0.4	mg/L		0.1		E300.0	06/26/18 15:00 / ljl
108	Sulfate	2120	mg/L	D	4		E300.0	06/26/18 00:42 / ljl
001	Calcium	514	mg/L		1		E200.7	06/27/18 21:45 / eli-b
002	Magnesium	105	mg/L		1		E200.7	06/27/18 21:45 / eli-b
003	Potassium	6	mg/L		1		E200.7	06/27/18 21:45 / eli-b
004	Sodium	370	mg/L		1		E200.7	06/27/18 21:45 / eli-b
NON-METALS								
072	Organic Carbon, Dissolved (DOC)	3.0	mg/L		0.5		A5310 C	06/27/18 01:41 / dmb
	Sulfide	<0.04	mg/L		0.04		A4500-S D	06/27/18 10:11 / eli-b
NUTRIENTS								
310	Nitrogen, Nitrate+Nitrite as N	10.8	mg/L	D	0.1		E353.2	06/25/18 12:17 / dmb
138	Nitrogen, Ammonia as N	0.02	mg/L	J	0.05		A4500-NH3 G	06/29/18 11:58 / dmb
METALS, DISSOLVED								
022	Aluminum	0.003	mg/L	J	0.03		E200.8	07/03/18 17:14 / eli-b
024	Barium	0.008	mg/L	J	0.05		E200.7	06/27/18 21:45 / eli-b
032	Iron	0.006	mg/L	J	0.02		E200.8	07/03/18 17:14 / eli-b
034	Manganese	0.52	mg/L	D	0.01		E200.7	06/27/18 21:45 / eli-b
036	Molybdenum	0.001	mg/L		0.001		E200.8	07/11/18 10:33 / eli-b
069	Phosphorus	<0.4	mg/L	D	0.4		E200.7	06/27/18 21:45 / eli-b
040	Selenium	0.089	mg/L		0.001		E200.8	07/03/18 17:14 / eli-b
080	Silica	17.5	mg/L	D	0.8		E200.7	06/27/18 21:45 / eli-b
015	Uranium	0.109	mg/L		0.0003		E200.8	07/03/18 17:14 / eli-b
042	Vanadium	<0.01	mg/L		0.01		E200.8	07/05/18 19:10 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

Table 4.1-3
Water Quality Analyses for Well DD2

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18020133-005
Client Sample ID: DD2_20180202

Report Date: 03/05/18
Collection Date: 02/02/18 07:20
Date Received: 02/06/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
007 Chloride	68	mg/L		1		E300.0	02/09/18 16:23 / ljl
108 Sulfate	1570	mg/L	D	4		E300.0	02/09/18 16:23 / ljl
PHYSICAL PROPERTIES							
010 Solids, Total Dissolved TDS @ 180 C	2640	mg/L	D	20		A2540 C	02/07/18 18:48 / mvr
METALS, DISSOLVED							
036 Molybdenum	<0.03	mg/L		0.03		E200.8	02/09/18 23:42 / eli-b
040 Selenium	<0.005	mg/L		0.005		E200.8	02/09/18 23:42 / eli-b
015 Uranium	0.219	mg/L		0.0003		E200.8	02/09/18 23:42 / eli-b
244 Uranium Precision (±)	0.0354	mg/L		0.00005		E200.8	02/09/18 23:42 / eli-b
113 Uranium, Activity	1.5E-07	uCi/mL		2.0E-10		E200.8	02/09/18 23:42 / eli-b
114 Uranium, Activity precision (±)	2.4E-08	uCi/mL		3.0E-11		E200.8	02/09/18 23:42 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18050055-003
Client Sample ID: DD2

Report Date: 05/30/18
Collection Date: 04/30/18 10:25
Date Received: 05/01/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
175 Alkalinity, Total as CaCO3	282	mg/L		5		A2320 B	05/02/18 12:07 / ljl
206 Carbonate as CO3	<5	mg/L		5		A2320 B	05/02/18 12:07 / ljl
505 Bicarbonate as HCO3	344	mg/L		5		A2320 B	05/02/18 12:07 / ljl
007 Chloride	67	mg/L		1		E300.0	05/03/18 15:20 / ljl
108 Sulfate	1490	mg/L	D	4		E300.0	05/03/18 15:20 / ljl
001 Calcium	368	mg/L		0.5		E200.7	05/05/18 11:29 / eli-b
003 Potassium	6	mg/L	D	1		E200.7	05/09/18 01:42 / eli-b
004 Sodium	353	mg/L	D	1		E200.7	05/07/18 20:01 / eli-b
PHYSICAL PROPERTIES							
009 pH	7.11	s.u.	H	0.01		A4500-H B	05/02/18 11:32 / ljl
pH Measurement Temp	17	°C				A4500-H B	05/02/18 11:32 / ljl
010 Solids, Total Dissolved TDS @ 180 C	1710	mg/L	D	20		A2540 C	05/02/18 15:19 / mvr
NUTRIENTS							
310 Nitrogen, Nitrate+Nitrite as N	<0.1	mg/L		0.1		E353.2	05/03/18 11:09 / dmb
METALS, DISSOLVED							
034 Manganese	2.46	mg/L		0.001		E200.8	05/04/18 23:57 / eli-b
036 Molybdenum	0.006	mg/L		0.001		E200.8	05/04/18 23:57 / eli-b
040 Selenium	<0.001	mg/L		0.001		E200.8	05/04/18 23:57 / eli-b
015 Uranium	0.210	mg/L		0.0003		E200.8	05/04/18 23:57 / eli-b
244 Uranium Precision (±)	0.0339	mg/L		0.00005		E200.8	05/04/18 23:57 / eli-b
113 Uranium, Activity	1.4E-07	uCi/mL		2.0E-10		E200.8	05/04/18 23:57 / eli-b
114 Uranium, Activity precision (±)	2.3E-08	uCi/mL		3.0E-11		E200.8	05/04/18 23:57 / eli-b
042 Vanadium	<0.01	mg/L		0.01		E200.8	05/04/18 23:57 / eli-b
RADIONUCLIDES, DISSOLVED							
045 Radium 226	0.6	pCi/L				E903.0	05/14/18 10:51 / arh
245 Radium 226 precision (±)	0.2	pCi/L				E903.0	05/14/18 10:51 / arh
Radium 226 MDC	0.2	pCi/L				E903.0	05/14/18 10:51 / arh
256 Radium 226 altu	6.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
258 Radium 226 altu precision (±)	2.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
Radium 226 altu MDC	2.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
057 Radium 228	1.9	pCi/L				RA-05	05/08/18 09:11 / plj
257 Radium 228 precision (±)	0.7	pCi/L				RA-05	05/08/18 09:11 / plj
Radium 228 MDC	1.1	pCi/L				RA-05	05/08/18 09:11 / plj
359 Radium 228 altu	2.0E-09	uCi/mL				RA-05	05/08/18 09:11 / plj
360 Radium 228 altu precision (±)	7.0E-10	uCi/mL				RA-05	05/08/18 09:11 / plj
Radium 228 altu MDC	1.0E-09	uCi/mL				RA-05	05/08/18 09:11 / plj
048 Thorium 230	0.07	pCi/L	U			E908.0	05/23/18 08:42 / cnh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18050055-003
Client Sample ID: DD2

Report Date: 05/30/18
Collection Date: 04/30/18 10:25
Date Received: 05/01/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, DISSOLVED								
248	Thorium 230 precision (±)	0.09	pCi/L				E908.0	05/23/18 08:42 / cnh
	Thorium 230 MDC	0.1	pCi/L				E908.0	05/23/18 08:42 / cnh
362	Thorium 230 altu	7.0E-11	uCi/mL	U			E908.0	05/23/18 08:42 / cnh
363	Thorium 230 altu precision (±)	9.0E-11	uCi/mL				E908.0	05/23/18 08:42 / cnh
	Thorium 230 altu MDC	1.0E-10	uCi/mL				E908.0	05/23/18 08:42 / cnh
DATA QUALITY								
079	Solids, Total Dissolved - Calculated	2500	mg/L				A1030 E	05/10/18 08:55 / tjp
192	A/C Balance	3.10	%				A1030 E	05/10/18 08:55 / tjp
194	Anions	38.6	meq/L				A1030 E	05/10/18 08:55 / tjp
195	Cations	41.0	meq/L				A1030 E	05/10/18 08:55 / tjp
200	TDS Ratio	0.67	unitless				A1030 E	05/10/18 08:55 / tjp

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

Table 4.1-4
Water Quality Analyses for Well P

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18030729-001
Client Sample ID: P

Report Date: 04/17/18
Collection Date: 03/22/18 08:24
Date Received: 03/26/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS								
175	Alkalinity, Total as CaCO3	194	mg/L		5		A2320 B	03/27/18 16:48 / mvr
206	Carbonate as CO3	<5	mg/L		5		A2320 B	03/27/18 16:48 / mvr
505	Bicarbonate as HCO3	236	mg/L		5		A2320 B	03/27/18 16:48 / mvr
007	Chloride	51	mg/L		1		E300.0	03/29/18 02:11 / ljl
108	Sulfate	1030	mg/L	D	2		E300.0	03/29/18 02:11 / ljl
001	Calcium	234	mg/L		0.5		E200.7	03/29/18 18:17 / eli-b
002	Magnesium	47.4	mg/L		0.5		E200.7	03/29/18 18:17 / eli-b
003	Potassium	4.9	mg/L	D	0.7		E200.7	03/29/18 18:17 / eli-b
004	Sodium	253	mg/L	D	1		E200.7	03/29/18 18:17 / eli-b
PHYSICAL PROPERTIES								
009	pH	7.62	s.u.	H	0.01		A4500-H B	03/27/18 09:48 / jeu
010	Solids, Total Dissolved TDS @ 180 C	1820	mg/L	D	20		A2540 C	03/28/18 11:28 / jeu
NUTRIENTS								
310	Nitrogen, Nitrate+Nitrite as N	5.0	mg/L		0.1		E353.2	04/02/18 11:19 / dmb
METALS, DISSOLVED								
036	Molybdenum	<0.03	mg/L		0.03		E200.8	03/29/18 16:39 / eli-b
040	Selenium	0.131	mg/L		0.005		E200.8	03/29/18 16:39 / eli-b
015	Uranium	0.0260	mg/L		0.0003		E200.8	03/29/18 16:39 / eli-b
244	Uranium Precision (±)	0.00420	mg/L		0.00005		E200.8	03/29/18 16:39 / eli-b
113	Uranium, Activity	1.8E-08	uCi/mL		2.0E-10		E200.8	03/29/18 16:39 / eli-b
114	Uranium, Activity precision (±)	2.9E-09	uCi/mL		3.0E-11		E200.8	03/29/18 16:39 / eli-b
RADIONUCLIDES, DISSOLVED								
045	Radium 226	0.3	pCi/L				E903.0	04/10/18 08:26 / arh
245	Radium 226 precision (±)	0.2	pCi/L				E903.0	04/10/18 08:26 / arh
	Radium 226 MDC	0.2	pCi/L				E903.0	04/10/18 08:26 / arh
256	Radium 226 altu	3.0E-10	uCi/mL				E903.0	04/10/18 08:26 / arh
258	Radium 226 altu precision (±)	2.0E-10	uCi/mL				E903.0	04/10/18 08:26 / arh
	Radium 226 altu MDC	2.0E-10	uCi/mL				E903.0	04/10/18 08:26 / arh
DATA QUALITY								
079	Solids, Total Dissolved - Calculated	1800	mg/L				A1030 E	04/16/18 16:55 / tla
192	A/C Balance	-0.66	%				A1030 E	04/16/18 16:55 / tla
194	Anions	27.1	meq/L				A1030 E	04/16/18 16:55 / tla
195	Cations	26.7	meq/L				A1030 E	04/16/18 16:55 / tla
200	TDS Ratio	1.02	unitless				A1030 E	04/16/18 16:55 / tla

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18050055-004
Client Sample ID: P

Report Date: 05/30/18
Collection Date: 04/30/18 09:37
Date Received: 05/01/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS								
175	Alkalinity, Total as CaCO3	202	mg/L		5		A2320 B	05/02/18 12:15 / ljl
206	Carbonate as CO3	<5	mg/L		5		A2320 B	05/02/18 12:15 / ljl
505	Bicarbonate as HCO3	246	mg/L		5		A2320 B	05/02/18 12:15 / ljl
007	Chloride	49	mg/L		1		E300.0	05/03/18 15:39 / ljl
108	Sulfate	988	mg/L	D	2		E300.0	05/03/18 15:39 / ljl
001	Calcium	241	mg/L		0.5		E200.7	05/05/18 11:41 / eli-b
003	Potassium	5.2	mg/L	D	0.7		E200.7	05/09/18 01:46 / eli-b
004	Sodium	267	mg/L		0.5		E200.7	05/07/18 20:05 / eli-b
PHYSICAL PROPERTIES								
010	Solids, Total Dissolved TDS @ 180 C	1830	mg/L	D	20		A2540 C	05/05/18 17:06 / mvr
NUTRIENTS								
310	Nitrogen, Nitrate+Nitrite as N	5.0	mg/L		0.1		E353.2	05/03/18 11:10 / dmb
METALS, DISSOLVED								
036	Molybdenum	0.002	mg/L		0.001		E200.8	05/05/18 00:02 / eli-b
040	Selenium	0.125	mg/L		0.001		E200.8	05/05/18 00:02 / eli-b
015	Uranium	0.0267	mg/L		0.0003		E200.8	05/05/18 00:02 / eli-b
244	Uranium Precision (±)	0.00432	mg/L		0.00005		E200.8	05/05/18 00:02 / eli-b
113	Uranium, Activity	1.8E-08	uCi/mL		2.0E-10		E200.8	05/05/18 00:02 / eli-b
114	Uranium, Activity precision (±)	2.9E-09	uCi/mL		3.0E-11		E200.8	05/05/18 00:02 / eli-b
042	Vanadium	<0.01	mg/L		0.01		E200.8	05/05/18 00:02 / eli-b
RADIONUCLIDES, DISSOLVED								
045	Radium 226	0.4	pCi/L				E903.0	05/14/18 10:51 / arh
245	Radium 226 precision (±)	0.2	pCi/L				E903.0	05/14/18 10:51 / arh
	Radium 226 MDC	0.2	pCi/L				E903.0	05/14/18 10:51 / arh
256	Radium 226 altu	4.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
258	Radium 226 altu precision (±)	2.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
	Radium 226 altu MDC	2.0E-10	uCi/mL				E903.0	05/27/18 15:02 / sec
057	Radium 228	1.8	pCi/L				RA-05	05/08/18 09:11 / plj
257	Radium 228 precision (±)	0.8	pCi/L				RA-05	05/08/18 09:11 / plj
	Radium 228 MDC	1.0	pCi/L				RA-05	05/08/18 09:11 / plj
359	Radium 228 altu	2.0E-09	uCi/mL				RA-05	05/08/18 09:11 / plj
360	Radium 228 altu precision (±)	8.0E-10	uCi/mL				RA-05	05/08/18 09:11 / plj
	Radium 228 altu MDC	1.0E-09	uCi/mL				RA-05	05/08/18 09:11 / plj
048	Thorium 230	0.05	pCi/L	U			E908.0	05/23/18 08:42 / cnh
248	Thorium 230 precision (±)	0.09	pCi/L				E908.0	05/23/18 08:42 / cnh
	Thorium 230 MDC	0.1	pCi/L				E908.0	05/23/18 08:42 / cnh
362	Thorium 230 altu	5.0E-11	uCi/mL	U			E908.0	05/23/18 08:42 / cnh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18050055-004
Client Sample ID: P

Report Date: 05/30/18
Collection Date: 04/30/18 09:37
Date Received: 05/01/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, DISSOLVED								
363	Thorium 230 altu precision (±)	9.0E-11	uCi/mL				E908.0	05/23/18 08:42 / cnh
	Thorium 230 altu MDC	1.0E-10	uCi/mL				E908.0	05/23/18 08:42 / cnh
DATA QUALITY								
079	Solids, Total Dissolved - Calculated	1700	mg/L				A1030 E	05/10/18 08:55 / tjp
192	A/C Balance	2.36	%				A1030 E	05/10/18 08:55 / tjp
194	Anions	26.4	meq/L				A1030 E	05/10/18 08:55 / tjp
195	Cations	27.6	meq/L				A1030 E	05/10/18 08:55 / tjp
200	TDS Ratio	1.05	unitless				A1030 E	05/10/18 08:55 / tjp

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

Table 4.1-5
Water Quality Analyses for Well S4

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18030669-010
Client Sample ID: S4

Revised Date: 04/23/18
Report Date: 04/05/18
Collection Date: 03/22/18 11:15
Date Received: 03/23/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
175 Alkalinity, Total as CaCO3	412	mg/L		5		A2320 B	03/25/18 00:34 / mvr
206 Carbonate as CO3	<5	mg/L		5		A2320 B	03/25/18 00:34 / mvr
505 Bicarbonate as HCO3	503	mg/L		5		A2320 B	03/25/18 00:34 / mvr
007 Chloride	206	mg/L		1		E300.0	03/28/18 17:21 / ljl
031 Fluoride	0.3	mg/L	D	0.2		E300.0	03/28/18 17:21 / ljl
108 Sulfate	787	mg/L	D	2		E300.0	03/28/18 17:21 / ljl
001 Calcium	249	mg/L		1		E200.7	03/28/18 18:47 / eli-b
002 Magnesium	63	mg/L		1		E200.7	03/28/18 18:47 / eli-b
003 Potassium	5	mg/L		1		E200.7	03/28/18 18:47 / eli-b
004 Sodium	290	mg/L		1		E200.7	03/28/18 18:47 / eli-b
NON-METALS							
072 Organic Carbon, Dissolved (DOC)	0.6	mg/L		0.5		A5310 C	03/28/18 18:44 / dmb
Sulfide	<0.04	mg/L	H	0.04		A4500-S D	03/29/18 12:23 / eli-b
NUTRIENTS							
310 Nitrogen, Nitrate+Nitrite as N	0.77	mg/L		0.01		E353.2	03/26/18 15:27 / dmb
138 Nitrogen, Ammonia as N	<0.05	mg/L		0.05		A4500-NH3 G	03/27/18 11:54 / dmb
METALS, DISSOLVED							
022 Aluminum	<0.03	mg/L		0.03		E200.8	03/28/18 15:23 / eli-b
032 Iron	0.02	mg/L		0.02		E200.8	03/28/18 15:23 / eli-b
034 Manganese	<0.001	mg/L		0.001		E200.8	03/28/18 15:23 / eli-b
036 Molybdenum	0.291	mg/L		0.001		E200.8	03/28/18 15:23 / eli-b
069 Phosphorus	<0.4	mg/L	D	0.4		E200.7	03/28/18 18:47 / eli-b
040 Selenium	0.021	mg/L		0.001		E200.8	03/28/18 15:23 / eli-b
080 Silica	26.4	mg/L		0.2		E200.8	03/28/18 15:23 / eli-b
015 Uranium	0.141	mg/L		0.0003		E200.8	03/28/18 15:23 / eli-b
042 Vanadium	<0.01	mg/L		0.01		E200.8	03/28/18 15:23 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

Table 4.1-6
Water Quality Analyses for Well X

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18020666-007
Client Sample ID: X

Report Date: 03/12/18
Collection Date: 02/26/18 13:35
Date Received: 02/28/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
007 Chloride	133	mg/L		1		E300.0	03/02/18 23:26 / ljl
108 Sulfate	654	mg/L	D	2		E300.0	03/02/18 23:26 / ljl
PHYSICAL PROPERTIES							
010 Solids, Total Dissolved TDS @ 180 C	1390	mg/L	D	20		A2540 C	02/28/18 17:45 / mvr
METALS, DISSOLVED							
036 Molybdenum	0.07	mg/L		0.03		E200.8	03/02/18 16:21 / eli-b
040 Selenium	0.019	mg/L		0.005		E200.8	03/02/18 16:21 / eli-b
015 Uranium	0.0392	mg/L		0.0003		E200.8	03/02/18 16:21 / eli-b
244 Uranium Precision (±)	0.00632	mg/L		0.00005		E200.8	03/02/18 16:21 / eli-b
113 Uranium, Activity	2.7E-08	uCi/mL		2.0E-10		E200.8	03/02/18 16:21 / eli-b
114 Uranium, Activity precision (±)	4.3E-09	uCi/mL		3.0E-11		E200.8	03/02/18 16:21 / eli-b
CLIENT PROVIDED FIELD PARAMETERS							
109 Field pH	8.16	s.u.				FIELD	02/26/18 13:35 / tjp

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18030669-008
Client Sample ID: X

Revised Date: 04/23/18
Report Date: 04/05/18
Collection Date: 03/22/18 10:10
Date Received: 03/23/18
Matrix: Aqueous

Analyses		Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS								
175	Alkalinity, Total as CaCO3	231	mg/L		5		A2320 B	03/25/18 00:18 / mvr
206	Carbonate as CO3	<5	mg/L		5		A2320 B	03/25/18 00:18 / mvr
505	Bicarbonate as HCO3	282	mg/L		5		A2320 B	03/25/18 00:18 / mvr
007	Chloride	136	mg/L		1		E300.0	03/28/18 01:37 / ljl
031	Fluoride	0.3	mg/L	D	0.2		E300.0	03/28/18 01:37 / ljl
108	Sulfate	631	mg/L	D	2		E300.0	03/28/18 01:37 / ljl
001	Calcium	182	mg/L		1		E200.7	03/28/18 18:27 / eli-b
002	Magnesium	43	mg/L		1		E200.7	03/28/18 18:27 / eli-b
003	Potassium	6	mg/L		1		E200.7	03/28/18 18:27 / eli-b
004	Sodium	205	mg/L		1		E200.7	03/28/18 18:27 / eli-b
NON-METALS								
072	Organic Carbon, Dissolved (DOC)	0.6	mg/L		0.5		A5310 C	03/28/18 17:34 / dmb
	Sulfide	0.008	mg/L	JH	0.04		A4500-S D	03/29/18 12:23 / eli-b
NUTRIENTS								
310	Nitrogen, Nitrate+Nitrite as N	1.48	mg/L		0.01		E353.2	03/26/18 15:24 / dmb
138	Nitrogen, Ammonia as N	0.016	mg/L	J	0.05		A4500-NH3 G	03/27/18 11:52 / dmb
METALS, DISSOLVED								
022	Aluminum	0.0012	mg/L	J	0.03		E200.8	03/28/18 15:17 / eli-b
032	Iron	0.07	mg/L		0.02		E200.8	03/28/18 15:17 / eli-b
034	Manganese	0.003	mg/L		0.001		E200.8	03/28/18 15:17 / eli-b
036	Molybdenum	0.072	mg/L		0.001		E200.8	03/28/18 15:17 / eli-b
069	Phosphorus	<0.1	mg/L		0.1		E200.7	04/18/18 15:15 / eli-b
040	Selenium	0.013	mg/L		0.001		E200.8	03/28/18 15:17 / eli-b
080	Silica	12.2	mg/L		0.2		E200.8	03/28/18 15:17 / eli-b
015	Uranium	0.0447	mg/L		0.0003		E200.8	03/28/18 15:17 / eli-b
042	Vanadium	0.008	mg/L	J	0.01		E200.8	03/28/18 15:17 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040200-001
Client Sample ID: X

Report Date: 04/17/18
Collection Date: 04/04/18 11:22
Date Received: 04/05/18
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
007 Chloride	126	mg/L		1		E300.0	04/07/18 04:54 / ijl
108 Sulfate	575	mg/L	D	2		E300.0	04/07/18 04:54 / ijl
PHYSICAL PROPERTIES							
009 pH	7.38	s.u.	H	0.01		A4500-H B	04/06/18 11:33 / jeu
010 Solids, Total Dissolved TDS @ 180 C	1280	mg/L		10		A2540 C	04/06/18 14:13 / jeu
METALS, DISSOLVED							
036 Molybdenum	0.07	mg/L		0.03		E200.8	04/09/18 18:21 / eli-b
040 Selenium	0.013	mg/L		0.005		E200.8	04/09/18 18:21 / eli-b
015 Uranium	0.0412	mg/L		0.0003		E200.8	04/09/18 18:21 / eli-b
244 Uranium Precision (±)	0.00665	mg/L		0.00005		E200.8	04/09/18 18:21 / eli-b
113 Uranium, Activity	2.8E-08	uCi/mL		2.0E-10		E200.8	04/09/18 18:21 / eli-b
114 Uranium, Activity precision (±)	4.5E-09	uCi/mL		3.0E-11		E200.8	04/09/18 18:21 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
H - Analysis performed past recommended holding time.

Table 4.2- 1
Lined Pond Water Quality

Table 4.2-1. Lined Pond Water Quality

Sample Point Name	Date	Temp (deg.C)	pH (f) (std. units)	Conductivity (micromhos/cm)	CO3 (mg/l)	Ca (mg/l)	Cl (mg/l)	HCO3 (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	SO4 (mg/l)	TDS (mg/l)	NO3 (mg/l)
arameter Code		12	109	51	6	1	7	5	2	3	4	8	10	39
E Coll Pond	4/9/18	16.80	8.89	7469			449					3370	6050	
Evap Pond 1	2/8/18	15.80	9.53	38520			3380					24900	45300	
	4/9/18	15.70	9.25	48060			4020					30900	56000	
Evap Pond 2	2/8/18	15.80	9.26	19120			1260					9900	18500	
	4/9/18	15.00	9.08	21370			1540					12300	21100	
Evap Pond 3-A	2/8/18	14.50	9.58	94740			37200					15000	113000	
	4/16/18			112300			49800					25700	131000	
Evap Pond 3-B	2/8/18	15.90	9.65	70820			16500					20600	80100	
	4/16/18			129300			18200					35800	99900	
W Coll Pond	4/9/18	16.40	8.75	7323			451					3380	5840	

f = field measurement
t = analyte, total

Table 4.2-1. Lined Pond Water Quality, cont.

Sample Point Name	Date	Mn(t) (mg/l)	Se (mg/l)	Se (t) (mg/l)	Mo (mg/l)	Mo (t) (mg/l)	Unat (mg/l)	Unat (t) (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	Ra226+ Ra228 (pCi/l)	Th230 (pCi/l)	V (mg/l)
Parameter Code		134	140	140	36	136	15	115	45	57	372	48	42
E Coll Pond	4/9/18		0.51	0.484	13	12.1	6.42	6.13					
Evap Pond 1	2/8/18		0.63	0.67	63.3	113	61.6	67.6					
	4/9/18		0.514	0.335	124	124	80.3	80.6					
Evap Pond 2	2/8/18		0.951	0.984	34.9	46.5	23	23.5					
	4/9/18		1.05	1	48.7	49.9	26	25.6					
Evap Pond 3-A	2/8/18		0.66	0.76	1220	1240	376	386					
	4/16/18		0.79	0.94	1490	1610	455	563					
Evap Pond 3-B	2/8/18		0.37	0.43	550	596	364	372					
	4/16/18		0.38	0.38	534	555	368	363					
W Coll Pond	4/9/18		0.486	0.504	13.3	13.9	6.24	7.38					

f = field measurement
t = analyte, total

Table 4.2- 2
Evaporation Pond Monitoring Wells Water Quality

Table 4.2-2. Evaporation Pond Monitoring Wells Water Quality

Sample Point Name	Date	WL (feet)	Temp (deg.C)	pH (f) (std. units)	Conductivity (micromhos/cm)	CO3 (mg/l)	Ca (mg/l)	Cl (mg/l)	HCO3 (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)
Parameter Code		13	12	109	51	6	1	7	5	2	3	4
Site Standard Qal aquifer								250				
D1	3/5/18	37.33	12.00	8.00	2235			150				
	3/22/18	42.00	12.00	6.88	2352	<5	183	165	434	43	4	335
DD	2/2/18	51.04	12.50	7.45	3491			72				
	3/22/18	78.50	15.90	7.33	3788	<5	485	77	297	112	7	399
	4/30/18	49.54	13.10	7.20	2220	<5	198	139	392		3.7	316
	5/31/18	52.60	15.50	7.48	3811	<5	485	73	318	112	7	402
	6/21/18	47.90	14.30	7.30	3824	<5	514	73	329	105	6	370
DD2	2/2/18	49.34	12.20	7.24	2814			68				
	4/30/18	46.75	13.00	7.04	2994		368	67	344		6	353
P	3/22/18	40.22	12.80	7.56	2082		234	51	236	47.4	4.9	253
	4/30/18	40.07	13.60	7.50	2212		241	49	246		5.2	267
S4	3/22/18	38.95	14.90	6.73	2553		249	206	503	63	5	290
X	2/26/18	31.00	14.50	8.16	1856			133				
	3/22/18	31.07	13.80	7.15	1840	<5	182	136	282	43	6	205
	4/4/18	30.94	14.70	7.45	1611			126				

Concentrations greater than site standards are in **bold.**

f = field measurement

Table 4.2-2. Evaporation Pond Monitoring Wells Water Quality, cont.

Sample Point Name	Date	SO4 (mg/l)	TDS (mg/l)	NO3 (mg/l)	Se (mg/l)	Mo (mg/l)	Unat (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	Ra226+ Ra228 (pCi/l)	Th230 (pCi/l)	V (mg/l)
Parameter Code		8	10	39	40	36	15	45	57	372	48	42
Site Standard Qal aquifer		1500	2734	12	0.32	0.1	0.16			5	0.3	0.02
D1	3/5/18	697	1660		0.052	**2.56**	**1.75**					
	3/22/18	769		1.5	0.061	**2.66**	**1.97**					0.003
DD	2/2/18	**2050**	**3410**		0.089	<0.03	0.11					
	3/22/18	**2230**		**12.5**	0.082	0.01	0.11					<0.01
	4/30/18	728	1700	1.2	0.05	**1.57**	**1.50**	0.2	1.2	1.40	**0.3**	<0.01
	5/31/18	**2170**	**3530**	**13**	0.089	0.002	0.10	<0.2	2.7	<2.9	<0.1	<0.01
	6/21/18	**2120**		10.8	0.089	0.001	0.11					<0.01
DD2	2/2/18	**1570**	2640		<0.005	<0.03	**0.22**					
	4/30/18	1490	1710	<0.1	<0.001	0.01	**0.21**	0.60	1.90	2.50	<0.1	<0.01
P	3/22/18	1030	1820	5	0.131	<0.03	0.03	0.30				
	4/30/18	968	1830	5	0.125	0.002	0.03	0.40	1.80	2.20	<0.1	<0.01
S4	3/22/18	787		<0.05	0.021	**0.291**	0.14					<0.01
X	2/26/18	654	1390		0.019	0.07	0.04					
	3/22/18	631		1.5	0.13	0.07	0.04					0.01
	4/4/18	575			0.13	0.07	0.04					

Concentrations greater than site standards are in **bold**.

f = field measurement

Table 4.3-1
Compliant Water Quality

Table 4.3-1. Compliant Water Quality

Sample Point Name	Date	Temp (deg.C)	pH (f) (std. units)	Conductivity (micromhos/cm)	CO3 (mg/l)	Ca (mg/l)	Cl (mg/l)	HCO3 (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)
Parameter Code		12	109	51	6	1	7	5	2	3	4
Site Standard Qal aquifer							250				
							Post Treatment Tank				
SP2	1/30/2018	16.10	7.60	1643	<5	123	113	108	34.5	5.3	182
	2/26/2018	18.60	7.84	2249	<5	202	194	414	64	12.5	279
	3/29/2018	18.20	7.52	1721	<5	106	123	252	38.7	6.5	180
	4/25/2018	14.2	7.18	1451	<5	99	119	203	36.3	6	175
	5/4/2018	18.4	7.31		<5		187				
	5/10/2018	12.3	7.13	2236	<5	204	194	242	66.3	9.6	242
	5/17/2018	18.1	6.98	1607	<5	124	127	269	42.3	8.1	212
	5/24/2018	17.9	7.35	2115	<5	182	178	425	60.9	9.9	234
	5/31/2018	22.2	6.48	1832	<5	131	126	127	37.4	5.5	160
	6/7/2018	18.4	6.81	1607	<5	121	122	170	34.9	6.4	192
	6/14/2018	20.7	6.68	1615	<5	110	121	200	35.6	6.7	191
	6/21/2018	19.7	7.49	1586	<5	117	118	172	32.3	5.8	173
	6/28/2018	21.3	7.17	1876	<5	161	160	381	51.0	7.6	201

Concentrations greater than site standards are in **bold**.

f = field measurement

Table 4.3-1. Compliant Water Quality, cont.

Sample Point Name	Date	SO4 (mg/l)	TDS (mg/l)	NO3 (mg/l)	Se (mg/l)	Mo (mg/l)	Unat (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	Ra226+ Ra228 (pCi/l)	Th230 (pCi/l)	V (mg/l)
Parameter Code		8	10	39	40	36	15	45	57	372	48	42
Site Standard Qal aquifer		1500	2734	12	0.32	0.1	0.16			5	0.3	0.02
Post Treatment Tank												
SP2	1/30/2018	607	1170	1.5	0.019	0.01	0.03	<0.2	<2.3	<2.5	<0.1	<0.01
	2/26/2018	698	1690	1.7	0.009	0.01	0.02	0.4	<1.9	<2.3	<0.2	<0.01
	3/29/2018	441	1060	1.4	0.019	**0.24**	0.04	<0.2	<1.9	<2.1	<0.1	<0.01
	4/25/2018	456	1040	1.3	0.186	**0.28**	**0.19**	0.2	<1.8	<2.0	<0.1	<0.01
	5/4/2018	628	1570		0.007	<0.03	0.02					
	5/10/2018	665	1630	1.8	0.007	0.01	0.01	0.3	<2.4	<2.7	<0.1	<0.01
	5/17/2018	440	1070	1.5	0.006	0.01	0.02	0.4	2.2	2.60	<0.1	<0.01
	5/24/2018	571	1490	1.6	0.006	0.005	0.01	0.3	<1.9	<2.2	<0.1	<0.01
	5/31/2018	542	1100	1.9	0.014	0.006	0.04	0.3	<1.7	<2.0	<0.2	<0.01
	6/7/2018	534	1120	1.7	0.015	0.008	0.01	<0.2	3.6	<3.8	<0.2	<0.01
	6/14/2018	515	1140	1.7	0.013	0.010	0.01	0.2	<2.0	<2.2	<0.2	<0.01
	6/21/2018	515	1130	1.6	0.014	0.012	0.01	0.4	<2.3	<2.7	<0.1	<0.01
	6/28/2018	513	1360	1.5	0.005	0.003	0.01	0.5	<1.9	<2.4	0.009	<0.01

Concentrations greater than site standards are in bold.

f = field measurement

Table 4.3-2
Treated Water Quality

Table 4.3-2. Treated Water Quality

Sample Point Name	Date	Temp (deg.C)	pH (f) (std. units)	Conductivity (micromhos/cm)	CO3 (mg/l)	Ca (mg/l)	Cl (mg/l)	HCO3 (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)
Parameter Code		12	109	51	6	1	7	5	2	3	4
Site Standard Qal aquifer							250				
						RO Product					
RO SP1	1/30/2018	16.3	7.71	4253	<5	<1	4	7	<0.5	<0.5	8
	2/26/2018	17.6	7.57	1613	<5	21	5	<5	6.7	1.2	35
	3/29/2018	17.9	7.29	3782	<5	4	24	<5	3.8	<0.5	69
	4/25/2018	14.2	6.83	4348	<5	2	25	26	4.2	<0.5	87
	5/4/2018	17.2	5.2	3784			5				
	5/10/2018	20.5	5	6037	<5	<1	13	<5	<0.5	<0.5	15
	5/17/2018	16.8	5.37	9098	<5	<1	10	11	<0.5	<0.5	18
	5/24/2018	17.4	4.86	4203	<5	<1	9	6	<0.5	<0.5	10
	5/31/2018	19	5.4	1134	<5	<1	15	14	<0.5	<0.5	17
	6/7/2018	21.8	6.58	1591	<5	120	123	170	34.9	6.2	191
	6/14/2018	20.3	6.58	1616							
	6/21/2018	17.5	5.61	1083	<5	<0.5	12	13	<0.5	<0.5	19.3
	6/28/2016	22.4	7.21	1928	<5	164	163	408	51.5	7.6	205
						Zeolite Treated Water					
300Z	1/4/2018	19.8	6.41	2611	<5	198	161	49	53.7	4.9	228
	1/9/2018	17.8	6.12	2165	<5	201	160	55	53.9	5.4	241
	1/16/2018	15.4	5.99	1540	<5	209	161	55	55	6.1	246
	4/25/2018	14.1	5.75	2647	<5	250	201	59	68.3	9	321
	4/27/2018	16.2	6.07	2710	<5		201				
	5/1/2018	18.2	5.82	2711	<5	271	190	32	69.4	7.3	278
	5/8/2018	20.5	6.19	2440	<5	207	179	41	55.8	7.5	276
	5/15/2018				<5	184	172	69	45.4	9.6	410
	5/22/2018	14.4	7.01	1976	<5	148	119	79	31.5	6.3	263
1200Z Trains 1&2	1/4/2018	19	5.37	2213	<5	163	150	<5	13.5	7.6	265
	1/9/2018	17.6	5.46	2228	<5	173	156	27	45.4	6.8	270
	1/16/2018	17	6.02	2240	<5	188	151	74	48.3	7.5	268
	1/23/2018	14.7	6.4	2243	<5	211	171	80	56.6	6.9	262
	1/30/2018	15.9	6.34	2286	<5	209	170	87	55.8	6.9	257
	2/7/2018	12.1	6.52	2324	<5	219	178	78	58	7.5	262
	2/11/2018	11.8	6.62	2320	<5	218	173	80	59.3	7	249
	5/31/2018	19.2	3.44	2474	<5	191	172	<5	46.4	7.3	245
	6/5/2018				<5	172	163	<5	38.2	9.7	324
	6/12/2018	22	5.57	2542	<5	175	164	45	37.8	8.7	342
	6/18/2018				<5	165	171	52	44.4	9.6	353
1200Z Trains 3&4	1/4/2018	18.2	6.49	2321	<5	169	147	65	43.1	7.2	291
	1/9/2018	17.7	6.05	2316	<5	166	152	77	41.3	7.7	316
	1/16/2018	17.5	5.98	2255	<5	165	153	60	42.3	7.5	312
	1/23/2018	14.7	6.38	2240	<5	185	160	60	51.4	6.2	278
	1/30/2018	18.9	6.41	2208	<5	188	158	61	50.6	6.3	268
	2/7/2018	12.7	7.28	2224	<5	195	167	62	51	6.8	270
	2/11/2018	7.25	7.25	2264	<5	201	162	59	53.2	6	254

Concentrations greater than site standards are in **bold**.

f = field measurement

Table 4.3-2. Treated Water Quality, cont.

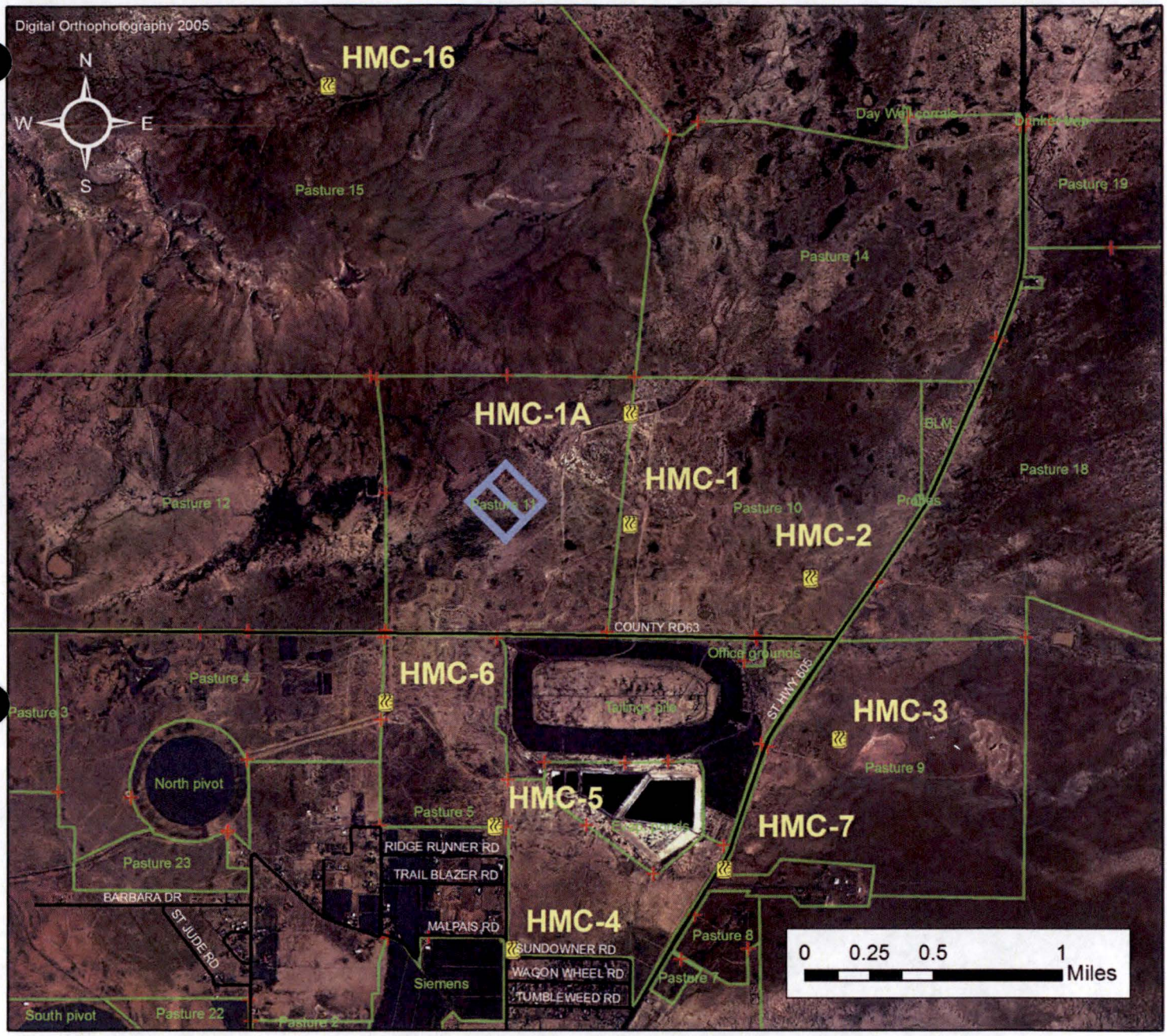
Sample Point Name	Date	SO4 (mg/l)	TDS (mg/l)	NO3 (mg/l)	Se (mg/l)	Mo (mg/l)	Unat (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	Ra226+ Ra228 (pCi/l)	Th230 (pCi/l)	V (mg/l)
Parameter Code		8	10	39	40	36	15	45	57	372	48	42
Site Standard Qal aquifer		1500	2734	12	0.32	0.1	0.16			5	0.3	0.02
							RO Product					
RO SP1	1/30/2018	5	30	0.4	<0.001	0.018	0.0083	<0.2	<2.5	<2.7	<0.2	<0.01
	2/26/2018	6	27	0.5	0.002	0.015	0.003	<0.2	<1.9	<2.1	<0.1	<0.01
	3/29/2018	126	234	0.8	0.031	**0.455**	0.0525	<0.2	1.9	<2.1	<0.1	<0.01
	4/25/2018	139	286	0.7	0.03	**0.58**	**0.398**	<0.2	<1.7	<1.9	<0.1	<0.01
	5/4/2018	5	35		<0.005	<0.03	0.0073					
	5/10/2018	8	43	1.4	0.001	0.016	0.0064	<0.2	<2.7	<2.9	<0.1	<0.01
	5/17/2018	4	47	0.9	<0.001	0.013	0.0092	0.2	<2.2	<2.4	<0.2	<0.01
	5/24/2018	3	33	0.5	<0.001	0.012	0.0035	<0.2	<1.8	<2.0	<0.2	0.2
	5/31/2018	3	58	1.4	<0.001	0.013	0.008	<0.3	<2.0	<2.3	<0.2	<0.01
	6/7/2018	536	1120	1.7	0.015	0.008	0.0087	<0.2	3.6	<3.8	<0.2	<0.01
	6/14/2018											
	6/21/2018	14	65	1.1	0.003	0.062	0.0281	0.2	<2.8	<3.1	<0.1	<0.01
	6/28/2016	523	1350	1.5	0.005	0.003	0.0124	0.4	<1.7	<2.1	<0.2	<0.01
							Zeolite Treated Water					
300Z	1/4/2018	1000	1760	2.2	0.032	0.017	0.0194	<0.2	<1.4	<1.6	<0.2	<0.01
	1/9/2018	960	1730	2	0.033	0.02	0.033	<0.2	<2.3	<2.5	<0.2	<0.01
	1/16/2018	1020	1810	2.2	0.03	0.013	0.0317	0.2	<2.0	<2.2	<0.1	<0.01
	4/25/2018	1260	2250	3.2	0.049	0.053	0.0868	<0.2	<1.6	<1.8	<0.1	<0.01
	4/27/2018	1260	2290		0.046	0.05	0.0488					
	5/1/2018	1210	2270	3.3	0.046	0.021	0.0229	0.2	<1.5	<1.7	<0.1	<0.01
	5/8/2018	1070	1930	2.1	0.029	0.029	0.016	<0.2	<1.8	<2.0	<0.2	<0.01
	5/15/2018	1190	2090	2.6	0.049	0.02	0.0178	0.3	<2.2	<2.5	<0.1	<0.01
	5/22/2018	795	1510	1.2	0.034	0.017	0.0333	0.4	<2.3	<2.7	<0.2	<0.01
1200Z Trains 1&2	1/4/2018	964	1700	2.4	0.04	0.006	0.0276	<0.2	<1.3	<1.5	<0.2	<0.01
	1/9/2018	984	1730	2.4	0.039	0.007	0.0153	0.2	<2.2	<2.4	<0.2	<0.01
	1/16/2018	934	1750	2.2	0.034	0.015	0.0145	0.1	<1.7	<1.8	<0.2	<0.01
	1/23/2018	1010	1810	2.4	0.037	0.016	0.0304	<0.2	2.5	<2.7	<0.2	<0.01
	1/30/2018	1030	1830	2.3	0.034	0.019	0.0551	0.3	<1.9	<2.2	0.2	<0.01
	2/7/2018	1060	1880	2.1	0.035	0.017	0.0718	0.2	<1.5	<1.7	<0.2	<0.01
	2/11/2018	1110	1960	2	0.032	0.017	0.0592	0.2	<1.8	<2.0	<0.1	<0.01
	5/31/2018	1120	1840	2.6	0.041	<0.001	0.0755	<0.2	<1.7	<1.9	0.2	<0.01
	6/5/2018	1010	1840	2.6	0.042	0.004	0.0201	<0.2	<2.0	<2.2	<0.2	<0.01
	6/12/2018	1060	1940	2.6	0.046	0.011	0.0045	0.2	<2.1	<2.3	<0.1	<0.01
	6/18/2018	1130	1980	2.5	0.041	0.005	0.0041	0.2	<2.3	<2.5	<0.2	<0.01
1200Z Trains 3&4	1/4/2018	981	1750	2.2	0.042	0.004	0.0281	<0.2	<1.5	<1.7	<0.2	<0.01
	1/9/2018	999	1760	2.1	0.044	0.004	0.0437	0.2	<2.3	<2.5	<0.1	<0.01
	1/16/2018	980	1760	2	0.037	0.007	0.0565	0.2	<1.9	<2.1	0.3	<0.01
	1/23/2018	980	1760	2.3	0.036	0.007	0.0808	<0.2	<1.1	<1.3	0.2	<0.01
	1/30/2018	981	1780	2.4	0.035	0.01	0.104	<0.2	<1.9	<2.1	<0.1	<0.01
	2/7/2018	1000	1770	2.2	0.037	0.011	0.157	0.2	1.9	2.1	<0.2	<0.01
	2/11/2018	1060	1810	2.3	0.032	0.007	0.11	<0.2	<1.9	<2.1	<0.3	<0.01

Concentrations greater than site standards are in **bold.**

f = field measurement

Figure 1 – Monitoring & Sampling Locations

FIGURE 1 : HMC Air Monitoring & Sampling Locations - Grants, NM



Location ID	Sampling Unit	Northing	Easting
HMC-1	Hi-Vol Particulate (Air), Track-Etch Cup (Radon), OSL Badge (Gamma)	1547458.8	491370.5
HMC-1A	Hi-Vol Particulate (Air), Track-Etch Cup (Radon), OSL Badge (Gamma)	1549715.8	491387.7
HMC-2	Hi-Vol Particulate (Air), Track-Etch Cup (Radon), OSL Badge (Gamma)	1546349.5	495053.2
HMC-3	Hi-Vol Particulate (Air), Track-Etch Cup (Radon), OSL Badge (Gamma)	1543048.7	495640.5
HMC-4	Hi-Vol Particulate (Air), Track-Etch Cup (Radon), OSL Badge (Gamma)	1538751.1	488918.0
HMC-5	Hi-Vol Particulate (Air), Track-Etch Cup (Radon), OSL Badge (Gamma)	1541268.4	488546.3
HMC-6	Hi-Vol Particulate (Air), Track-Etch Cup (Radon), OSL Badge (Gamma)	1543813.1	486297.3
HMC-7	Track-Etch Cup (Radon)	1540395.7	493293.8
HMC-16	Track-Etch Cup (Radon), OSL Badge (Gamma)	1556470.5	485135.1

Location
Road
Gate
EP-3
Fence Line
Section Line

HOMESTAKE

Attachment 1
High Volume Air Sampling Results
(Second half of 2017)

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ANALYTICAL SUMMARY REPORT

May 28, 2018

Homestake Mining Co
Hwy 605
Grants, NM 87020

Work Order: C18040358 Quote ID: C5150 - Hi-Vol Filters

Project Name: Grants

Energy Laboratories, Inc. Casper WY received the following 8 samples for Homestake Mining Co on 4/10/2018 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C18040358-001	HMC-1	03/30/18 00:00	04/10/18	Filter	Metals by ICP/ICPMS, Total Composite of two or more samples Client Provided Field Parameters Metals, Total Digestion, Total Metals Digestion, Total Metals, Radiochemistry Radiochemistry Air Filter Compliance Calculations RAD-AIR, Routine Radiological Reports RAD Alternate Unit Reporting Air Filters Radium 226 Thorium, Isotopic
C18040358-002	HMC-1A	03/30/18 00:00	04/10/18	Filter	Same As Above
C18040358-003	HMC-2	03/30/18 00:00	04/10/18	Filter	Same As Above
C18040358-004	HMC-3	03/30/18 00:00	04/10/18	Filter	Same As Above
C18040358-005	HMC-4	03/30/18 00:00	04/10/18	Filter	Same As Above
C18040358-006	HMC-5	03/30/18 00:00	04/10/18	Filter	Same As Above
C18040358-007	HMC-6	03/30/18 00:00	04/10/18	Filter	Same As Above
C18040358-008	HMC-7	03/30/18 00:00	04/10/18	Filter	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Homestake Mining Co
Project: Grants
Work Order: C18040358

Report Date: 05/28/18

CASE NARRATIVE

Tests associated with analyst identified as ELI-H were subcontracted to Energy Laboratories, 3161 E.Lyndale Ave., Helena, MT, EPA Number MT00945.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-001
Client Sample ID: HMC-1

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/19/18 12:55 / eli-h
METALS, IN AIR							
Uranium	7.6E-11	mg/L		2.1E-14		SW6020	04/19/18 12:55 / eli-h
Uranium, Activity	5.1E-17	uCi/mL		1.4E-20		SW6020	04/19/18 12:55 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	2.7E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	1.0E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	9.1E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	4.8E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 precision (±)	2.8E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 MDC	4.1E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	3.9	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	1.5	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.3	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	0.68	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.39	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.58	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	7.3	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	3.0E-03	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	2.0E-02	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	6.0E-02	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.42e8	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-1

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-001	^{nat}U	5E-17	N/A	N/A	1E-16	9E-14	6E-02
First Quarter 2018	^{230}Th	5E-18	3E-18	4E-18	1E-16	3E-14	2E-02
Air Volume in mLs	^{226}Ra	3E-17	1E-17	9E-18	1E-16	9E-13	3E-03
1.42E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-002
Client Sample ID: HMC-1A

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/19/18 12:57 / eli-h
METALS, IN AIR							
Uranium	5.6E-11	mg/L		2.1E-14		SW6020	04/19/18 12:57 / eli-h
Uranium, Activity	3.8E-17	uCi/mL		1.4E-20		SW6020	04/19/18 12:57 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	2.7E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	1.0E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	9.1E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	9.6E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 precision (±)	1.8E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 MDC	2.5E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	3.9	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	1.5	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.3	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	1.4	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.27	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.37	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	5.5	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	3.0E-03	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	3.0E-02	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	4.0E-02	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.46e8	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-1A

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-002	^{nat}U	4E-17	N/A	N/A	1E-16	9E-14	4E-02
First Quarter 2018	^{230}Th	1E-17	2E-18	3E-18	1E-16	3E-14	3E-02
Air Volume in mLs	^{226}Ra	3E-17	1E-17	9E-18	1E-16	9E-13	3E-03
1.46E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-003
Client Sample ID: HMC-2

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/19/18 12:59 / eli-h
METALS, IN AIR							
Uranium	7.4E-11	mg/L		2.1E-14		SW6020	04/19/18 12:59 / eli-h
Uranium, Activity	5.0E-17	uCi/mL		1.4E-20		SW6020	04/19/18 12:59 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	2.6E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	1.1E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	9.9E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	8.1E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 precision (±)	1.5E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 MDC	4.0E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	3.7	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	1.5	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.4	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	1.2	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.22	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.58	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	7.2	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	3.0E-03	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	3.0E-02	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	6.0E-02	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.44e8	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-2

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-003	^{nat}U	5E-17	N/A	N/A	1E-16	9E-14	6E-02
First Quarter 2018	^{230}Th	8E-18	2E-18	4E-18	1E-16	3E-14	3E-02
Air Volume in mLs	^{226}Ra	3E-17	1E-17	1E-17	1E-16	9E-13	3E-03
1.44E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-004
Client Sample ID: HMC-3

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/19/18 13:01 / eli-h
METALS, IN AIR							
Uranium	1.4E-10	mg/L		2.1E-14		SW6020	04/19/18 13:01 / eli-h
Uranium, Activity	9.2E-17	uCi/mL		1.4E-20		SW6020	04/19/18 13:01 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	2.5E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	9.7E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	8.7E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	1.1E-17	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 precision (±)	2.1E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 MDC	4.0E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	3.5	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	1.4	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.2	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	1.6	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.30	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.56	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	13.1	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	3.0E-03	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	4.0E-02	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	1.0E-01	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.42e8	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-3

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-004	^{nat}U	9E-17	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2018	^{230}Th	1E-17	2E-18	4E-18	1E-16	3E-14	4E-02
Air Volume in mLs	^{226}Ra	2E-17	1E-17	9E-18	1E-16	9E-13	3E-03
1.42E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-005
Client Sample ID: HMC-4

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.17	mg/filter		0.10		SW6020	04/19/18 13:18 / eli-h
METALS, IN AIR							
Uranium	1.4E-10	mg/L		2.2E-14		SW6020	04/19/18 13:18 / eli-h
Uranium, Activity	9.7E-17	uCi/mL		1.5E-20		SW6020	04/19/18 13:18 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	4.5E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	1.4E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	9.1E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	1.8E-17	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 precision (±)	3.4E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 MDC	3.9E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	6.3	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	1.9	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.3	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	2.5	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.48	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.55	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	13.6	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	5.0E-03	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	6.0E-02	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	1.1E-01	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.40e8	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-4

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-005	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2018	^{230}Th	2E-17	3E-18	4E-18	1E-16	3E-14	6E-02
Air Volume in mLs	^{226}Ra	4E-17	1E-17	9E-18	1E-16	9E-13	5E-03
1.40E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-006
Client Sample ID: HMC-5

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.16	mg/filter		0.10		SW6020	04/19/18 13:21 / eli-h
METALS, IN AIR							
Uranium	1.5E-10	mg/L		2.1E-14		SW6020	04/19/18 13:21 / eli-h
Uranium, Activity	1.0E-16	uCi/mL		1.4E-20		SW6020	04/19/18 13:21 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	4.8E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	1.4E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	9.1E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	2.2E-17	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 precision (±)	4.1E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 MDC	3.2E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	6.8	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	2.0	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.3	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	3.1	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.59	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.45	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	14.4	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	5.0E-03	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	7.0E-02	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	1.1E-01	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.42e8	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-5

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-006	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
First Quarter 2018	^{230}Th	2E-17	4E-18	3E-18	1E-16	3E-14	7E-02
Air Volume in mLs	^{226}Ra	5E-17	1E-17	9E-18	1E-16	9E-13	5E-03
1.42E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-007
Client Sample ID: HMC-6

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.11	mg/filter		0.10		SW6020	04/19/18 13:23 / eli-h
METALS, IN AIR							
Uranium	7.0E-11	mg/L		2.1E-14		SW6020	04/19/18 13:23 / eli-h
Uranium, Activity	4.7E-17	uCi/mL		1.4E-20		SW6020	04/19/18 13:23 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	5.1E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	1.7E-17	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	9.5E-18	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	1.6E-17	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 precision (±)	3.0E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
Thorium 230 MDC	4.8E-18	uCi/mL				E908.0	04/26/18 12:37 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	7.4	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	2.5	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.4	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	2.3	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.44	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.69	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	6.8	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	6.0E-03	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	5.0E-02	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	5.0E-02	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.45e8	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-6

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-007	^{nat}U	5E-17	N/A	N/A	1E-16	9E-14	5E-02
First Quarter 2018	^{230}Th	2E-17	3E-18	5E-18	1E-16	3E-14	5E-02
Air Volume in mLs	^{226}Ra	5E-17	2E-17	9E-18	1E-16	9E-13	6E-03
1.45E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18040358-008
Client Sample ID: HMC-7

Report Date: 05/28/18
Collection Date: 03/30/18
Date Received: 04/10/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	04/19/18 13:25 / eli-h
METALS, IN AIR							
Uranium	0.00034	mg/L		3.0E-06		SW6020	04/19/18 13:25 / eli-h
Uranium, Activity	2.3E-10	uCi/mL		2.1E-12		SW6020	04/19/18 13:25 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	3.0E-09	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 precision (±)	1.4E-09	uCi/mL				E903.0	04/23/18 14:23 / arh
Radium 226 MDC	1.5E-09	uCi/mL				E903.0	04/23/18 14:23 / arh
Thorium 230	2.3E-10	uCi/mL	U			E908.0	05/01/18 12:49 / cnh
Thorium 230 precision (±)	2.7E-10	uCi/mL				E908.0	05/01/18 12:49 / cnh
Thorium 230 MDC	4.6E-10	uCi/mL				E908.0	05/01/18 12:49 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	3.0	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 precision (±)	1.4	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Radium 226 MDC	1.5	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230	0.23	pCi/Filter	U			RADCALC	05/22/18 13:14 / sec
Thorium 230 precision (±)	0.27	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Thorium 230 MDC	0.46	pCi/Filter				RADCALC	05/22/18 13:14 / sec
Uranium, Activity	0.23	pCi/Filter		0.20		RADCALC	05/22/18 13:14 / sec
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	3.3E+05	%				RADCALC	05/22/18 13:18 / sec
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	05/22/18 13:18 / sec
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, % of EFF	7.6E+05	%				RADCALC	05/22/18 13:18 / sec
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, % of EFF	2.6E+05	%				RADCALC	05/22/18 13:18 / sec
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	05/22/18 13:18 / sec
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	05/22/18 13:18 / sec
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1	L				FIELD	03/30/18 00:00 / sec

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-7

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18040358-008	^{nat}U	2E-18	N/A	N/A	1E-16	9E-14	2E-03
First Quarter 2018	^{230}Th	2E-18	2E-18	3E-18	1E-16	3E-14	5E-03
Air Volume in mLs	^{226}Ra	2E-17	1E-17	1E-17	1E-16	9E-13	2E-03
1.43E+11							

Air Volumes on this page based on average of quarterly set; accompanying standard report uses a 1 L default volume.

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226

Day for Lead-210

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Report Date: 05/04/18
Project: Grants
Work Order: C18040358

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: 51470
Lab ID: LCS-51470		Laboratory Control Sample				Run: TENNELEC-3_180416B				04/23/18 14:23
Radium 226		84.4	pCi/L		88	80	120			
Lab ID: MB-51470	3	Method Blank				Run: TENNELEC-3_180416B				04/23/18 14:23
Radium 226		0.2	pCi/L							U
Radium 226 precision (±)		0.2	pCi/L							
Radium 226 MDC		0.3	pCi/L							
Lab ID: C18040358-001AMS		Sample Matrix Spike				Run: TENNELEC-3_180416B				04/23/18 14:23
Radium 226		6.07E-07	pCi/L		87	70	130			
Lab ID: C18040358-001AMSD		Sample Matrix Spike Duplicate				Run: TENNELEC-3_180416B				04/23/18 14:23
Radium 226		6.65E-07	pCi/L		95	70	130	9.0	20	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants

Report Date: 05/04/18
Work Order: C18040358

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0										Batch: 51470
Lab ID: LCS-51470		Laboratory Control Sample				Run: EGG-ORTEC_180418B				04/26/18 12:37
Thorium 230		51.3	pCi/L		109	80	120			
Lab ID: C18040358-006AMS		Sample Matrix Spike				Run: EGG-ORTEC_180418B				04/26/18 12:37
Thorium 230		1.40E-06	pCi/L		104	70	130			
Lab ID: C18040358-006AMSD		Sample Matrix Spike Duplicate				Run: EGG-ORTEC_180418B				04/26/18 12:37
Thorium 230		1.51E-06	pCi/L		111	70	130	7.5	20	
Lab ID: C18040358-008ADUP	3	Sample Duplicate				Run: EGG-ORTEC_180418B				04/26/18 12:37
Thorium 230		0.344	pCi/L					40	20	UR
Thorium 230 precision (±)		0.369	pCi/L							
Thorium 230 MDC		0.623	pCi/L							
- The Sample and the Duplicate are both below the MDC. The RPD is acceptable.										
Lab ID: MB-51470	3	Method Blank				Run: EGG-ORTEC_180418B				04/26/18 12:37
Thorium 230		0.1	pCi/L							U
Thorium 230 precision (±)		0.2	pCi/L							
Thorium 230 MDC		0.3	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Report Date: 05/28/18
Project: Grants
Work Order: C18040358

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Analytical Run: SUB-H134050	
Lab ID: ICV	2	Initial Calibration Verification Standard							04/19/18 11:03	
Uranium		0.0569	mg/L	0.00030	95	90	110			
Vanadium		0.0600	mg/L	0.0010	100	90	110			
Method: SW6020									Batch: H_41210	
Lab ID: MB-51406		Method Blank				Run: SUB-H134050			04/19/18 11:32	
Uranium		3E-05	mg/L	3E-06						
Lab ID: H18040082-001ADIL		Serial Dilution				Run: SUB-H134050			04/19/18 11:36	
Uranium		2.65E-10	mg/L	1.5E-10		0	0	3.0	20	
Lab ID: LCS2-51406		Laboratory Control Sample				Run: SUB-H134050			04/19/18 11:42	
Uranium		0.0980	mg/L	3.0E-06	93	70	130			
Lab ID: LFB-51406		Laboratory Fortified Blank				Run: SUB-H134050			04/19/18 11:44	
Uranium		0.0492	mg/L	3.0E-06	103	80	120			
Lab ID: C18030804-001A		Serial Dilution				Run: SUB-H134050			04/19/18 12:27	
Uranium		7.73E-08	mg/L	1.1E-08		0	0		20	N
Lab ID: LFB-51410		Laboratory Fortified Blank				Run: SUB-H134050			04/19/18 12:36	
Uranium		0.0491	mg/L	3.0E-06	103	80	120			
Lab ID: H18040270-001ADIL		Serial Dilution				Run: SUB-H134050			04/19/18 12:53	
Uranium		6.91E-11	mg/L	1.5E-10		0	0		20	
Lab ID: LFB-51470		Laboratory Fortified Blank				Run: SUB-H134050			04/19/18 13:06	
Uranium		0.0487	mg/L	3.0E-06	103	80	120			
Lab ID: H18040270-001AMS		Sample Matrix Spike				Run: SUB-H134050			04/19/18 13:08	
Uranium		0.0554	mg/L	3.0E-06	117	75	125			
Lab ID: MB-51410		Method Blank				Run: SUB-H134050			04/19/18 12:23	
Uranium		3E-05	mg/L	3E-06						
Lab ID: LCS2-51410		Laboratory Control Sample				Run: SUB-H134050			04/19/18 12:34	
Uranium		0.102	mg/L	3.0E-06	97	70	130			
Method: SW6020									Batch: H_41556	
Lab ID: MB-51472		Method Blank				Run: SUB-H134050			04/19/18 12:49	
Vanadium		ND	mg/filter	0.0007						
Lab ID: H18040270-001ADIL		Serial Dilution				Run: SUB-H134050			04/19/18 12:53	
Vanadium		0.014	mg/filter	0.10		0	0		10	N
Lab ID: LCS2-51472		Laboratory Control Sample				Run: SUB-H134050			04/19/18 13:04	
Vanadium		0.093	mg/filter	0.10	88	70	130			
Lab ID: LFB-51472		Laboratory Fortified Blank				Run: SUB-H134050			04/19/18 13:06	
Vanadium		0.049	mg/filter	0.10	104	75	125			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.
N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants

Report Date: 05/28/18
Work Order: C18040358

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020										Batch: H_41556
Lab ID: H18040270-001AMS	Sample Matrix Spike					Run: SUB-H134050				04/19/18 13:08
Vanadium		0.062	mg/filter	0.10	101	75	125			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

Work Order Receipt Checklist

Homestake Mining Co

C18040358

Login completed by: Dorian Quis
Reviewed by: Kasey Vidick
Reviewed Date: 4/11/2018

Date Received: 4/10/2018
Received by: mvr
Carrier name: NDA

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Applicable ☑
Container/Temp Blank temperature:	n/a°C		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

Page _____ of _____

PLEASE PRINT (Provide as much information as possible.)

Company Name: Homestake Mining Company

Project Name, PWS, Permit, Etc.: GRANTS

Sample Origin State:

EPA/State Compliance: Yes ☐ No ☐

Report Mail Address (Required): P.O. Box 98, Grants NM, 87020

Contact Name: Kyle Martinez

Phone/Fax: 1-505-287-4456 ext. 29

Cell:

Sampler: (Please Print)

☐ No Hard Copy Email:

Invoice Contact & Phone: TR# 178223588457343037

Purchase Order:

Quote/Bottle Order:

Invoice Address (Required): SAME

☐ No Hard Copy Email:

Special Report/Formats:

☐ DW ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format:_____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids
Vegetation Bioassay Other
DW - Drinking Water

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Total Uranium	Total RA 226	Total TH 230	Total Vanadium	SEE ATTACHED
1 HMC - 1	1rst	Q		X	X	X	X	
2 HMC - 1A				X	X	X	X	
3 HMC - 2	2018			X	X	X	X	
4 HMC - 3				X	X	X	X	
5 HMC - 4	Composite			X	X	X	X	
6 HMC - 5				X	X	X	X	
7 HMC - 6				X	X	X	X	
8 HMC - 7				X	X	X	X	
9								
10								

Standard Turnaround (TAT)

R U S H

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments: See attached Air Volumes C18040358

Shipped by:

Cooler ID(s):

Receipt Temp _____ °C

On Ice: Y N

Custody Seal: On Bottle Y N; On Cooler Y N

Intact Y N

Signature Match Y N

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Kyle Martinez	4-5-18				

Sample Disposal: Return to Client: _____ Lab Disposal: _____

Received by Laboratory: Meyn Nelson 4/10/18 10:30 MR

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

2018 1st QTR

Total Sampling Volume for Quarter (mL)							
1	1A	2	3	4	5	6	7
1.42E+11	1.46E+11	1.44E+11	1.42E+11	1.40E+11	1.42E+11	1.45E+11	n/a

ENERGY LABORATORIES
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www.energylab.com
Billings, MT 800.735.4489 • Casper, WY 888.235.0515
Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

ANALYTICAL SUMMARY REPORT

August 15, 2018

Homestake Mining Co
Hwy 605
Grants, NM 87020

Work Order: C18070373 Quote ID: C5150 - Hi-Vol Filters

Project Name: Grants

Energy Laboratories, Inc. Casper WY received the following 8 samples for Homestake Mining Co on 7/11/2018 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C18070373-001	HMC-1	06/30/18 00:00	07/11/18	Filter	Metals by ICP/ICPMS, Total Composite of two or more samples Client Provided Field Parameters Metals, Total Digestion, Total Metals Digestion, Total Metals, Radiochemistry Radiochemistry Air Filter Compliance Calculations RAD-AIR, Routine Radiological Reports RAD Alternate Unit Reporting Air Filters Radium 226 Thorium, Isotopic
C18070373-002	HMC-1A	06/30/18 00:00	07/11/18	Filter	Same As Above
C18070373-003	HMC-2	06/30/18 00:00	07/11/18	Filter	Same As Above
C18070373-004	HMC-3	06/30/18 00:00	07/11/18	Filter	Same As Above
C18070373-005	HMC-4	06/30/18 00:00	07/11/18	Filter	Same As Above
C18070373-006	HMC-5	06/30/18 00:00	07/11/18	Filter	Same As Above
C18070373-007	HMC-6	06/30/18 00:00	07/11/18	Filter	Same As Above
C18070373-008	HMC-7	06/30/18 00:00	07/11/18	Filter	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Homestake Mining Co
Project: Grants
Work Order: C18070373

Report Date: 08/15/18

CASE NARRATIVE

Tests associated with analyst identified as ELI-H were subcontracted to Energy Laboratories, 3161 E.Lyndale Ave., Helena, MT, EPA Number MT00945.

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-001
Client Sample ID: HMC-1

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.10	mg/filter		0.10		SW6020	07/24/18 15:46 / eli-h
METALS, IN AIR							
Uranium	1.7E-10	mg/L				SW6020	07/24/18 16:27 / eli-h
Uranium, Activity	1.2E-16	uCi/mL				SW6020	07/24/18 16:27 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	4.9E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	1.5E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	1.5E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	9.5E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	1.8E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	2.7E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	7.0	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	2.2	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.1	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	1.4	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	0.26	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.39	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	16.4	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	5.0E-03	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	3.0E-02	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	1.3E-01	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	142000000	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: August 15, 2018

SAMPLE ID: HMC-1

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-001	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
Second Quarter 2018	^{230}Th	1E-17	2E-18	3E-18	1E-16	3E-14	3E-02
Air Volume in mLs	^{226}Ra	5E-17	2E-17	1E-17	1E-16	9E-13	5E-03
1.42E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-002
Client Sample ID: HMC-1A

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.11	mg/filter		0.10		SW6020	07/24/18 15:50 / eli-h
METALS, IN AIR							
Uranium	1.4E-10	mg/L				SW6020	07/24/18 16:29 / eli-h
Uranium, Activity	9.5E-17	uCi/mL				SW6020	07/24/18 16:29 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	5.3E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	1.7E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	1.4E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	1.7E-17	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	3.2E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	3.0E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	7.5	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	2.4	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.0	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	2.3	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	0.45	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.42	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	13.4	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	6.0E-03	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	6.0E-02	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	1.1E-01	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	141000000	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: August 15, 2018

SAMPLE ID: HMC-1A

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-002	^{nat}U	1E-16	N/A	N/A	1E-16	9E-14	1E-01
Second Quarter 2018	^{230}Th	2E-17	3E-18	3E-18	1E-16	3E-14	6E-02
Air Volume in mLs	^{226}Ra	5E-17	2E-17	1E-17	1E-16	9E-13	6E-03
1.41E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-003
Client Sample ID: HMC-2

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.12	mg/filter		0.10		SW6020	07/24/18 15:52 / eli-h
METALS, IN AIR							
Uranium	2.9E-10	mg/L				SW6020	07/24/18 16:30 / eli-h
Uranium, Activity	2.0E-16	uCi/mL				SW6020	07/24/18 16:30 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	7.8E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	2.3E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	1.7E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	1.6E-17	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	3.0E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	4.0E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	10.4	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	3.0	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.2	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	2.1	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	0.39	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.53	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	26.1	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	9.0E-03	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	5.0E-02	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	2.2E-01	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	133000000	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: August 15, 2018

SAMPLE ID: HMC-2

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-003	^{nat}U	2E-16	N/A	N/A	1E-16	9E-14	2E-01
Second Quarter 2018	^{230}Th	2E-17	3E-18	4E-18	1E-16	3E-14	5E-02
Air Volume in mLs	^{226}Ra	8E-17	2E-17	2E-17	1E-16	9E-13	9E-03
1.33E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-004
Client Sample ID: HMC-3

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.11	mg/filter		0.10		SW6020	07/24/18 15:53 / eli-h
METALS, IN AIR							
Uranium	9.2E-10	mg/L				SW6020	07/24/18 16:32 / eli-h
Uranium, Activity	6.2E-16	uCi/mL				SW6020	07/24/18 16:32 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	6.9E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	2.0E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	1.5E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	1.9E-17	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	3.6E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	2.0E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	9.2	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	2.6	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.0	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	2.5	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	0.48	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.27	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	83.2	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	8.0E-03	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	6.0E-02	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	6.9E-01	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	134000000	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: August 15, 2018

SAMPLE ID: HMC-3

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-004	^{nat}U	6E-16	N/A	N/A	1E-16	9E-14	7E-01
Second Quarter 2018	^{230}Th	2E-17	4E-18	2E-18	1E-16	3E-14	6E-02
Air Volume in mLs	^{226}Ra	7E-17	2E-17	2E-17	1E-16	9E-13	8E-03
1.34E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-005
Client Sample ID: HMC-4

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.44	mg/filter		0.10		SW6020	07/24/18 15:55 / eli-h
METALS, IN AIR							
Uranium	1.5E-09	mg/L				SW6020	07/24/18 16:34 / eli-h
Uranium, Activity	1.0E-15	uCi/mL				SW6020	07/24/18 16:34 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	1.9E-16	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	4.4E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	1.7E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	5.4E-17	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	1.0E-17	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	4.0E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	24.8	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	5.7	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.1	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	6.9	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	1.3	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.51	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	130	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	2.0E-02	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	1.8E-01	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	1.1E+00	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	128000000	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: August 15, 2018

SAMPLE ID: HMC-4

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-005	^{nat}U	1E-15	N/A	N/A	1E-16	9E-14	1E+00
Second Quarter 2018	^{230}Th	5E-17	1E-17	4E-18	1E-16	3E-14	2E-01
Air Volume in mLs	^{226}Ra	2E-16	4E-17	2E-17	1E-16	9E-13	2E-02
1.28E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-006
Client Sample ID: HMC-5

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.17	mg/filter		0.10		SW6020	07/24/18 16:11 / eli-h
METALS, IN AIR							
Uranium	2.7E-09	mg/L				SW6020	07/24/18 16:48 / eli-h
Uranium, Activity	1.8E-15	uCi/mL				SW6020	07/24/18 16:48 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	6.2E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	1.9E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	1.5E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	2.0E-17	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	3.9E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	2.6E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	8.7	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	2.7	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.2	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	2.9	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	0.54	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.37	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	258	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	7.0E-03	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	7.0E-02	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	2.1E+00	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	140000000	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: August 15, 2018

SAMPLE ID: HMC-5

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-006	^{nat}U	2E-15	N/A	N/A	1E-16	9E-14	2E+00
Second Quarter 2018	^{230}Th	2E-17	4E-18	3E-18	1E-16	3E-14	7E-02
Air Volume in mLs	^{226}Ra	6E-17	2E-17	2E-17	1E-16	9E-13	7E-03
1.40E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-007
Client Sample ID: HMC-6

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	0.18	mg/filter		0.10		SW6020	07/24/18 16:13 / eli-h
METALS, IN AIR							
Uranium	3.9E-10	mg/L				SW6020	07/24/18 16:50 / eli-h
Uranium, Activity	2.6E-16	uCi/mL				SW6020	07/24/18 16:50 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	7.1E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	2.2E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	1.6E-17	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	2.3E-17	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	4.3E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	3.2E-18	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	9.5	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	3.0	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.1	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	3.0	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	0.57	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.43	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	35.5	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	8.0E-03	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	8.0E-02	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	2.9E-01	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	134000000	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: August 15, 2018

SAMPLE ID: HMC-6

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-007	^{nat}U	3E-16	N/A	N/A	1E-16	9E-14	3E-01
Second Quarter 2018	^{230}Th	2E-17	4E-18	3E-18	1E-16	3E-14	8E-02
Air Volume in mLs	^{226}Ra	7E-17	2E-17	2E-17	1E-16	9E-13	8E-03
1.34E+11							

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants
Lab ID: C18070373-008
Client Sample ID: HMC-7

Report Date: 08/15/18
Collection Date: 06/30/18
Date Received: 07/11/18
Matrix: Filter

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL							
Vanadium	<0.10	mg/filter		0.10		SW6020	07/24/18 16:15 / eli-h
METALS, IN AIR							
Uranium	0.00049	mg/L				SW6020	07/24/18 16:52 / eli-h
Uranium, Activity	3.3E-10	uCi/mL				SW6020	07/24/18 16:52 / eli-h
RADIONUCLIDES - IN AIR							
Radium 226	2.3E-09	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 precision (±)	1.3E-09	uCi/mL				E903.0	07/30/18 13:37 / arh
Radium 226 MDC	2.0E-09	uCi/mL				E903.0	07/30/18 13:37 / arh
Thorium 230	1.8E-10	uCi/mL	U			E908.0	08/01/18 17:22 / cnh
Thorium 230 precision (±)	1.5E-10	uCi/mL				E908.0	08/01/18 17:22 / cnh
Thorium 230 MDC	2.4E-10	uCi/mL				E908.0	08/01/18 17:22 / cnh
RADIONUCLIDES - IN AIR - PER FILTER							
Radium 226	2.3	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 precision (±)	1.3	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Radium 226 MDC	2.0	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230	0.18	pCi/Filter	U			RADCALC	08/06/18 15:35 / dmf
Thorium 230 precision (±)	0.15	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Thorium 230 MDC	0.24	pCi/Filter				RADCALC	08/06/18 15:35 / dmf
Uranium, Activity	0.33	pCi/Filter		0.20		RADCALC	08/06/18 15:35 / dmf
RADIOCHEMISTRY AIR FILTER COMPLIANCE							
Radium 226, % of EFF	2.5E+05	%				RADCALC	08/06/18 15:25 / dmf
Radium 226, EFF Week	9.0E-13	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Radium 226, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, % of EFF	5.9E+05	%				RADCALC	08/06/18 15:25 / dmf
Thorium 230, EFF Year	3.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Thorium 230, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, % of EFF	3.7E+05	%				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, EFF Year	9.0E-14	uCi/mL				RADCALC	08/06/18 15:25 / dmf
Uranium Natural, LLD	1.0E-16	uCi/mL				RADCALC	08/06/18 15:25 / dmf
CLIENT PROVIDED FIELD PARAMETERS							
Air Filtering Volume	1.0	L				FIELD	06/30/18 00:00 / ***

*** Field data provided by client

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Homestake Mining Co - Grants
PROJECT: Grants
REPORT DATE: February 7, 2018

SAMPLE ID: HMC-7

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D.+ µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C18070373-008	^{nat}U	2E-18	N/A	N/A	1E-16	9E-14	2E-03
Second Quarter 2018	^{230}Th	2E-18	2E-18	3E-18	1E-16	3E-14	6E-03
Air Volume in mLs	^{226}Ra	2E-17	1E-17	1E-17	1E-16	9E-13	2E-03
1.36E+11							

Air Volumes on this page based on average of quarterly set; accompanying standard report uses a 1 L default volume.

+LLD's are from NRC Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226

Day for Lead-210

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Homestake Mining Co
Project: Grants

Report Date: 07/31/18
Work Order: C18070373

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Analytical Run: ICPMS205-H_180724B
Lab ID: **ICV**	Initial Calibration Verification Standard								07/24/18 13:58
Uranium	0.0547	mg/L	0.00030	91	90	110			
Vanadium	0.0596	mg/L	0.0010	99	90	110			
Method: **SW6020**									Batch: 42379
Lab ID: **MB-51953**	Method Blank				Run: ICPMS205-H_180724B				07/24/18 16:25
Uranium	6E-05	mg/L							
Lab ID: **LCS2-51953**	Laboratory Control Sample				Run: ICPMS205-H_180724B				07/24/18 16:36
Uranium	0.0946	mg/L	1.5E-10	90	85	115			
Lab ID: **LFB-51953**	Laboratory Fortified Blank				Run: ICPMS205-H_180724B				07/24/18 16:38
Uranium	0.0440	mg/L	1.5E-10	93	75	125			
Lab ID: **C18070373-008ADIL**	Serial Dilution				Run: ICPMS205-H_180724B				07/24/18 16:54
Uranium	0.000510	mg/L	1.5E-10		0	0	3.8	20	
Lab ID: **C18070373-008AMS**	Sample Matrix Spike				Run: ICPMS205-H_180724B				07/24/18 16:56
Uranium	0.0455	mg/L	1.5E-10	95	75	125			
Method: **SW6020**									Batch: 42380
Lab ID: **MB-51967**	Method Blank				Run: ICPMS205-H_180724B				07/24/18 15:44
Vanadium	ND	mg/filter	0.0007						
Lab ID: **C18070373-001BDIL**	Serial Dilution				Run: ICPMS205-H_180724B				07/24/18 15:48
Vanadium	0.10	mg/filter	0.10		0	0	1.1	10	
Lab ID: **LCS2-51967**	Laboratory Control Sample				Run: ICPMS205-H_180724B				07/24/18 15:57
Vanadium	0.095	mg/filter	0.10	91	70	130			
Lab ID: **LFB-51967**	Laboratory Fortified Blank				Run: ICPMS205-H_180724B				07/24/18 15:59
Vanadium	0.045	mg/filter	0.10	95	75	125			
Lab ID: **C18070373-001BMS**	Sample Matrix Spike				Run: ICPMS205-H_180724B				07/24/18 16:01
Vanadium	0.15	mg/filter	0.10	96	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants

Report Date: 08/06/18
Work Order: C18070373

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E903.0**										Batch: 51953
Lab ID: **MB-51953**	3	Method Blank				Run: G542M_180723B				07/30/18 13:37
Radium 226		0.2	pCi/L							U
Radium 226 precision (±)		0.3	pCi/L							
Radium 226 MDC		0.4	pCi/L							
Lab ID: **LCS-51953**		Laboratory Control Sample				Run: G542M_180723B				07/30/18 13:37
Radium 226		108	pCi/L		117	80	120			
Lab ID: **C18070373-008AMS**		Sample Matrix Spike				Run: G542M_180723B				07/30/18 13:37
Radium 226		106	pCi/L		111	70	130			
Lab ID: **C18070373-008AMSD**		Sample Matrix Spike Duplicate				Run: G542M_180723B				07/30/18 13:37
Radium 226		82.8	pCi/L		85	70	130	24	20	R

- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than the limit of 2.0.

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants

Report Date: 08/06/18
Work Order: C18070373

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0										Batch: 51953
Lab ID: LCS-51953		Laboratory Control Sample				Run: EGG-ORTEC_180726B				08/01/18 17:22
Thorium 230		47.6	pCi/L		102	80	120			
Lab ID: C18070373-002AMS		Sample Matrix Spike				Run: EGG-ORTEC_180726B				08/01/18 17:22
Thorium 230		1.41E-06	pCi/L		104	70	130			
Lab ID: C18070373-002AMSD		Sample Matrix Spike Duplicate				Run: EGG-ORTEC_180726B				08/01/18 17:22
Thorium 230		1.38E-06	pCi/L		102	70	130	1.8	20	
Lab ID: MB-51953	3	Method Blank				Run: EGG-ORTEC_180726B				08/01/18 17:22
Thorium 230		0.3	pCi/L							U
Thorium 230 precision (±)		0.2	pCi/L							
Thorium 230 MDC		0.3	pCi/L							

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

Work Order Receipt Checklist

Homestake Mining Co

C18070373

Login completed by: Tessa Parke
Reviewed by: Terry Friedlan
Reviewed Date: 7/12/2018

Date Received: 7/11/2018
Received by: kak
Carrier name: Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Applicable ☑
Container/Temp Blank temperature:	23.6°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

Page _____ of _____

PLEASE PRINT (Provide as much information as possible.)

Company Name: HOMESTAKE MINING COMPANY	Project Name, PWS, Permit, Etc.: GRANTS	Sample Origin State:	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address (Required): P.O. BOX 98 GRANTS, NM 87020 ☑ No Hard Copy Email:	Contact Name: KYLE MARTINEZ Phone/Fax: 1 505 287 4456 Cell: EXT #29		Sampler: (Please Print)
Invoice Address (Required): SAME ☐ No Hard Copy Email:	Invoice Contact & Phone: TRACKING #: 1Z 822 358 90 5789 8641	Purchase Order:	Quote/Bottle Order:

Special Report/Formats:
☐ DW ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format: _____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids
Vegetation Bioassay Other
DW - Drinking Water

ANALYSIS REQUESTED

Standard Turnaround (TAT)

R U S H

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Shipped by:

Cooler ID(s):

Receipt Temp _____ °C

On Ice: Y N

Custody Seal On Bottle Y N On Cooler Y N

Intact Y N

Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	TOTAL URANIUM	Ra-226	Th-230	VANADIUM	SEE ATTACHED	Comments:
1	HMC - 1	↑			X	X	X	X		1.42 E+11 mL
2	HMC - 1A	2nd	QTR		X	X	X	X		1.41 E+11 mL
3	HMC - 2	1			X	X	X	X		1.33 E+11 mL
4	HMC - 3	20	18		X	X	X	X		1.34 E+11 mL
5	HMC - 4	1			X	X	X	X		1.28 E+11 mL
6	HMC - 5	COMPOSITE			X	X	X	X		1.40 E+11 mL
7	HMC - 6	↓			X	X	X	X		1.34 E+11 mL
8	HMC - 7	↓			X	X	X	X		N/A E+11 mL
9										
10										

LABORATORY USE ONLY C18070BB

Custody Record MUST be Signed

Relinquished by (print): CHUCK FARR	Date/Time: 7/5/18	Signature:	Received by (print):	Date/Time:	Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Sample Disposal: Return to Client: _____ Lab Disposal: _____			Received by Laboratory:	Date/Time: 7/10/18 9:21	Signature:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.

... www.energylab.com for additional information, downloadable fee schedule, forms, and links.

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2018 2nd QTR

Total Sampling Volume for Quarter (mL)							
1	1A	2	3	4	5	6	7
1.42E+11	1.41E+11	1.33E+11	1.34E+11	1.28E+11	1.40E+11	1.34E+11	n/a

Attachment 2

Radon Gas Monitoring Results

Attachment 2 - Radon Gas Monitoring Results

Track-Etch Passive Survey

Location	Monitoring Period	Rn Concentration (µCi/ml)	Uncertainty - 2 S.D. (µCi/ml)	% EC* (%)	LLD (µCi/ml)
HMC #1(average) N Outer Perimeter	7/5/17 - 01/09/18	8.3E-10	1.9E-10	8.3	3.2E-10
HMC #1-A (average) N Outer Perimeter	7/5/17 - 01/09/18	6.8E-10	1.8E-10	6.8	3.2E-10
HMC #2 (average) NE Outer Perimeter	7/5/17 - 01/09/18	7.7E-10	1.9E-10	7.7	3.2E-10
HMC #3 (average) E Outer Perimeter	7/5/17 - 01/09/18	6.6E-10	1.7E-10	6.6	3.2E-10
HMC #4 (average) S Outer Perimeter	7/5/17 - 01/09/18	7.9E-10	1.9E-10	7.9	3.2E-10
HMC #5 (average) N of Nearest Residence	7/5/17 - 01/09/18	7.4E-10	1.8E-10	7.4	3.2E-10
HMC #6 (average) W of Outer Perimeter	7/5/17 - 01/09/18	6.6E-10	1.7E-10	6.6	3.2E-10
HMC #7 (average) S Boundary	7/5/17 - 01/09/18	7.2E-10	1.8E-10	7.2	3.2E-10
HMC #16 (average) Background	7/5/17 - 01/09/18	3.3E-10	1.4E-10	3.3	3.2E-10

*EC of 1E-8 µCi/ml for radon-222 with daughters removed as given in 10 CFR20, Appendix B, Table 2

Attachment 3
2017 Radon Flux Monitoring Report

Radon Flux Measurements for the HMC Tailings Piles

June 2018

Prepare for:

Homestake Mining Company of California
P. O. Box 98
Grants, New Mexico 87020

Prepared by:

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113

Radon Flux Measurements for the HMC Tailings Piles

1. Introduction

Reclamation activities associated with the Large Tailings Pile (LTP) at the Grants Uranium Mill, owned by Homestake Mining Company of California (HMC), were completed in phases. The pile was contoured in 1994 at which time an interim cover was placed on the top of the pile to control the dispersal of tailings by wind and water erosion. Radon barriers were applied to the north, west, and south side slopes, with completion of the work in 1994. Radon flux measurements were made on these side slopes on October 24-25, 1994. Completion of the placement of radon barrier on the east side slope and aprons occurred just prior to making the radon flux measurements on July 24-25, 1995. An evaporation pond was constructed on the Small Tailings Pile (STP) and an interim cover placed on the remainder of the pile. Radon flux measurements were made on the top of the LTP and the interim cover of the Small Tailings Pile (STP) on August 18-19, 1995.

As part of a request for a license amendment extending the milestones in the NRC License, radon flux measurements were repeated in the areas with interim cover on October 21-22, 2003. This license amendment required HMC to repeat these measurements annually.

In 2017, the U.S. Nuclear Regulatory Commission (NRC) notified HMC (NRC, 2017) that the method historically used for calculating the average radon-222 flux release from the LTP was inconsistent with EPA's Method 115 specifications and could no longer include area-weighted averaging of the radon flux from the LTP's rock-covered side slopes (65% of the LTP surface area, with a radon flux of 3.27 pCi/m^2s, as measured in 1995 prior to placement of a final cap of rock armor for erosion control). With respect to the STP, the previous method for calculating radon flux from STP is consistent with Method 115 specifications on area-weighted averaging of various regions of the pile because the STP is considered an operational tailings pile under NRC definitions.[1]

Annual flux measurements for calendar year 2018 were made in two separate deployments, consisting of 100 canisters per deployment. The first 100 canister measurements were made on the LTP on May 8-9, 2018. The second 100 canister measurements were made on the STP on May 15-16, 2018. These deployments were conducted in accordance with the methods proposed in HMC's response to the NRC's recent notice of violation (NOV) regarding an average radon flux rate from the LTP that exceeded the 20 pCi/m^2s standard given in 10 CFR 40, Appendix A (ERG, 2017 and NRC, 2017). The deployment locations, with location identification (ID) numbers are shown in Figure 1-1. The flux measurement locations design was based on a triangular-grid pattern with randomized start point as generated using the U.S. Department of Energy's statistical design software package Visual Sampling Plan (VSP, 2016).

2. Radon Flux Results

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[1]As indicated in 10 CFR 40, Appendix A, "*Operation* means that a uranium or thorium mill tailings pile or impoundment is being used for the continued placement of byproduct material or is in standby status for such placement. A pile or impoundment is in operation from the day that byproduct material is first placed in the pile or impoundment until the day final closure begins." Since 11e.(2) byproduct material will continue to be disposed in the STP until groundwater restoration is complete, and because the final closure process for the STP has not been initiated, this pile is considered an operational tailings impoundment.

The results of the 200 flux measurements, consisting of 100 canisters on top of the LTP and 100 across all accessible portions of the STP are presented in Figure 2-1, and in tabular form in Appendix A. Per HMC's response to the NRC's radon flux NOV for the LTP (ERG, 2017), canisters were placed on the top of the pile only. The average measured flux from the top of the LTP for calendar year 2018 is 51.3 pCi/m²s, which exceeds the 20 pCi/m²s standard given in 10 CFR 40, Appendix A. This flux compares to an average measured flux on the top of the LTP in 1995 of 42.1 pCi/m²s. Since the STP is considered an operational impoundment, canisters were placed on the side slopes and southern portion of the pile, and area-weighted averaging was used to calculate the average rate of radon emissions from the pile (the evaporation pond area [28.7 acres, or 116,204 m²] was assigned a value of zero radon flux for the calculation, and the side slopes and southern portion area [26.0 acres, or 105,272 m²] were assigned a value of 26.7 pCi/m²s, based on the guidance specified in Method 115). Using Equation 2-1 below, the overall average measured radon flux from the STP for calendar year 2018 is 12.7 pCi/m²s, which meets the flux standard specified in 10 CFR 40 Appendix A.

Equation 2-1:

$$Flux_{STP} = \frac{(0.0\,pCi/m^2sec * 116{,}204\,m^2) + (26.7\,pCi/m^2sec * 105{,}272\,m^2)}{(116{,}204\,m^2 + 105{,}272\,m^2)} = 12.7\,pCi/m^2sec$$

The assumed radon flux for locations that included duplicate sample analysis (same canister analyzed twice) was based on the average of the duplicate analysis results.

Figure 1-1 - Measurement Locations

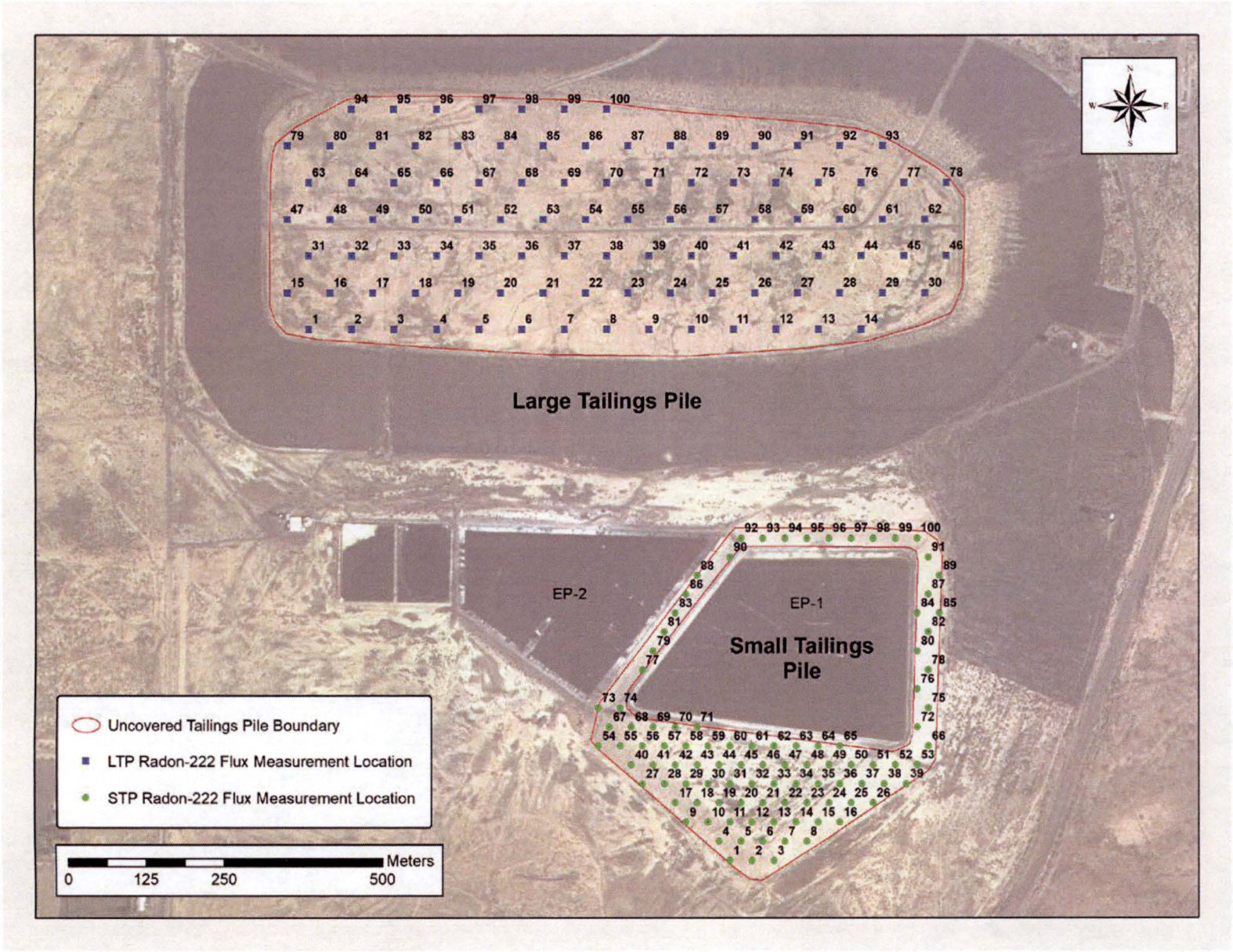
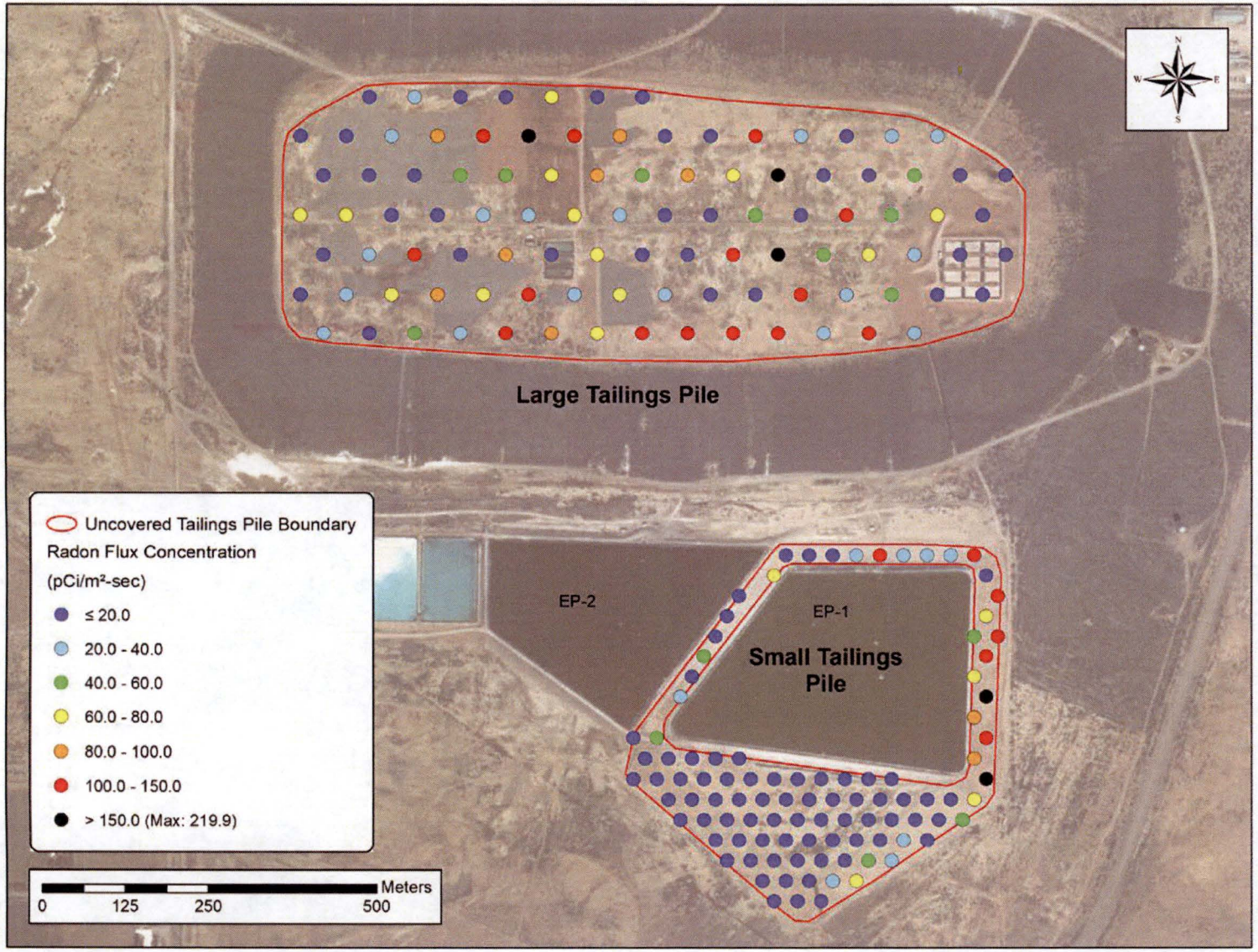


Figure 2-1 Radon Flux Measurement Results



3. Quality Assurance

The data quality requirements specified in EPA Method 115 were met for the measurements. There was no rainfall in the 24 hours prior to or during deployment and ambient temperatures did not fall below 35 degrees Fahrenheit during deployment.

Two independent sources were used to calibrate the spectrometer, using identical geometry conditions to that of the canisters. Good agreement between calibration factors was obtained as shown in Table 3.1. The relative percent difference (RPD) of the average efficiencies for the two sources was 5.1 percent, less than the 10% accuracy required by EPA Method 115.

Twenty-two canisters were reanalyzed for laboratory duplicate analysis comparisons. The second analysis is indicated in the Appendix A results table with a "D" shown in the Lab Type column. The comparison results are shown in Table 3.2 and are consistent with typical gamma spectroscopy results. All 22 canisters analyzed for duplicate measurement comparisons met the EPA Method 115 criteria requiring a relative percent difference (RPD) no greater than 10% for flux rates above 1.0 pCi/m^2s. The average RPD for all 22 canisters is 1.5 percent.

Two trip blanks for each 100-canister deployment (4 total) were included in the batch, and were counted without exposing them to radon. The measured fluxes ranged from 0.03 and 0.25 pCi/m^2s are near the expected 0 pCi/m^2s value. These results indicate that the canisters had not been exposed while sealed in the plastic bags, confirming the integrity of the bags during both deployments.

References

Environmental Restoration Group, Inc. (ERG). 2017. Proposal to address radon flux NOV for the LTP (NRC Docket No. 040-08903/2016-001 License No. SUA-1471). In: Reply to Notice of Violation, Docket No. 040-08903/2016-001, License No. SUA-1471 [Submitted to NRC by Homestake Mining Company of California (HMC) on September 13, 2017].

U.S. Nuclear Regulatory Commission (NRC). 2017. NRC Inspection Report 040-08903/2016-001 and Notice of Violation. April 20, 2017.

VSP Development Team (VSP). 2016. Visual Sample Plan: A Tool for Design and Analysis of Environmental Sampling. Version 7.7. Pacific Northwest National Laboratory. Richland, WA. http://vsp.pnnl.gov

Table 3.1 Quality Assurance Results of Standard Analysis

Identifier	Date	Count Duration (sec)	Activity (nCi)	Total Counts	Average BKG Counts	Efficiency	Error
STD #1	5/9/2018	1200	80	44721	3425	0.0116	6.18E-05
STD #3	5/9/2018	1200	78.83	41597	3425	0.0109	6.06E-05
STD #1	5/10/2018	1200	80	43112	3425	0.0112	6.07E-05
STD #3	5/10/2018	1200	78.83	41121	3425	0.0109	6.03E-05
STD #3	5/16/2018	1200	78.83	40595	3308	0.0107	5.99E-05
STD #1	5/16/2018	1200	80	44145	3308	0.0115	6.13E-05
STD #3	5/16/2018	1200	78.83	39310	3308	0.0103	5.90E-05
STD #1	5/16/2018	1200	80	42961	3308	0.0111	6.06E-05
STD #1	5/17/2018	1200	80	42717	3308	0.0111	6.04E-05
STD #3	5/17/2018	1200	78.83	41571	3308	0.0109	6.05E-05
STD #3	5/18/2018	1200	78.83	41393	3308	0.0109	6.04E-05
STD #1	5/18/2018	1200	80	44490	3308	0.0116	6.16E-05
STD #3	5/18/2018	1200	78.83	41214	3308	0.0108	6.03E-05
STD #1	5/18/2018	1200	80	42672	3308	0.0111	6.04E-05
Mean of STD #1						0.01075	
Mean of STD #3						0.01132	
Relative Percent Difference of Standards						5.1%	

Note:

[1] Efficiency unit is net counts-per-second per source activity in becquerels.

[2] SD: standard deviation of efficiency.

Table 3.2 Duplicate Analysis Comparison

Pile	Canister	Analysis 1 (pCi/m²s)	Analysis 2 (pCi/m²s)	Average Flux (pCi/m²s)	RPD (%)
LTP	476	26.4	26.4	26.4	0.0
LTP	475	64.9	62.9	63.9	3.1
LTP	438	33.2	33.6	33.4	1.1
LTP	405	134.0	135.8	134.9	1.3
LTP	5	7.0	7.1	7.1	1.5
LTP	411	39.6	39.8	39.7	0.4
LTP	435	84.5	86.4	85.5	2.3
LTP	407	78.0	78.9	78.5	1.2
LTP	499	129.1	125.3	127.2	3.0
LTP	430	87.3	86.9	87.1	0.5
LTP	485	72.0	71.7	71.9	0.4
STP	420	59.4	58.0	58.7	2.4
STP	437	30.4	31.4	30.9	3.5
STP	425	12.1	12.0	12.0	1.1
STP	200	11.5	11.4	11.4	0.9
STP	465	5.1	5.1	5.1	0.3
STP	495	2.2	2.2	2.2	1.0
STP	460	14.6	14.3	14.4	2.5
STP	422	7.7	7.6	7.7	2.2
STP	408	51.3	51.1	51.2	0.3
STP	2	80.2	79.2	79.7	1.3
STP	496	7.6	7.4	7.5	2.4

Appendix A

Radon Flux Measurement Results

ERG

Radon Flux Measurements

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM. 87113

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
1		487	05/08/2018 08:20	05/09/2018 09:41	05/09/2018 17:48	94	3425		5080	0.0111	31.44	0.5	0.48	OK
2		494	05/08/2018 08:39	05/09/2018 09:44	05/09/2018 17:35	323	3425		5521	0.0111	8.81	0.3	0.15	OK
3		458	05/08/2018 08:44	05/09/2018 09:56	05/09/2018 17:14	58	3425		5639	0.0111	57.91	0.7	0.81	OK
4		423	05/08/2018 09:04	05/09/2018 09:58	05/09/2018 17:32	134	3425		5546	0.0111	23.95	0.4	0.36	OK
5		490	05/08/2018 09:08	05/09/2018 10:11	05/09/2018 17:11	28	3425		5742	0.0111	124.47	1	1.68	OK
6		80	05/08/2018 09:34	05/09/2018 10:12	05/09/2018 17:08	35	3425		5190	0.0111	90.85	0.9	1.3	OK
7		483	05/08/2018 09:37	05/09/2018 10:27	05/09/2018 17:00	42	3425		5175	0.0111	74.42	0.8	1.07	OK
8		472	05/08/2018 09:59	05/09/2018 10:29	05/09/2018 16:56	28	3425		5287	0.0111	116.32	1	1.64	OK
9		400	05/08/2018 10:01	05/09/2018 10:40	05/09/2018 16:53	30	3425		5439	0.0111	110.8	1	1.54	OK
10		451	05/08/2018 10:23	05/09/2018 10:41	05/09/2018 16:26	29	3425		5326	0.0111	113.34	1	1.59	OK
11		433	05/08/2018 10:26	05/09/2018 10:54	05/09/2018 20:16	29	3425		5342	0.0111	116.1	1	1.63	OK
12		469	05/08/2018 10:40	05/09/2018 10:55	05/09/2018 20:23	123	3425		5018	0.0111	24.51	0.5	0.38	OK
13		425	05/08/2018 10:43	05/09/2018 11:04	05/09/2018 20:05	26	3425		5101	0.0111	123.99	1.1	1.77	OK
14		426	05/08/2018 10:52	05/09/2018 11:06	05/09/2018 19:22	80	3425		5211	0.0111	39.89	0.6	0.59	OK
15		427	05/08/2018 08:15	05/09/2018 09:40	05/09/2018 17:22	310	3425		5033	0.0111	8.17	0.3	0.15	OK
16		418	05/08/2018 08:32	05/09/2018 09:47	05/09/2018 17:46	81	3425		5155	0.0111	37.43	0.6	0.56	OK
17		312	05/08/2018 08:47	05/09/2018 09:54	05/09/2018 17:12	46	3425		5182	0.0111	67.58	0.8	0.98	OK
18		474	05/08/2018 09:00	05/09/2018 09:59	05/09/2018 17:28	49	3425		7864	0.0111	97.62	0.7	1.13	OK
19		470	05/08/2018 09:12	05/09/2018 10:09	05/09/2018 17:09	46	3425		5211	0.0111	68.22	0.8	0.98	OK
20		4	05/08/2018 09:30	05/09/2018 10:14	05/09/2018 17:16	22	3425		5285	0.0111	147.85	1.1	2.07	OK
21		263	05/08/2018 09:40	05/09/2018 10:25	05/09/2018 16:50	89	3425		5106	0.0111	33.78	0.5	0.51	OK
22		463	05/08/2018 09:55	05/09/2018 10:31	05/09/2018 16:54	42	3425		5289	0.0111	76.66	0.8	1.09	OK

Types: D-Duplicate, TB-Trip Blank

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Radon Flux Measurements

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM, 87113

Location Name	Field Type	Canister Number	Date/Time			Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s)			
			Deployment	Retrieval	Counting						Result	LLD	Error 1.00 S.D.	Remarks
23		438	05/08/2018 10:04	05/09/2018 10:38	05/09/2018 16:03	91	3425		5193	0.0111	33.56	0.5	0.5	OK
23		438	05/08/2018 10:04	05/09/2018 10:38	05/09/2018 16:05	92	3425	D	5194	0.0111	33.2	0.5	0.5	OK
24		481	05/08/2018 10:19	05/09/2018 10:43	05/09/2018 16:07	1008	3425		6677	0.0111	2.35	0.2	0.06	OK
25		486	05/08/2018 10:30	05/09/2018 10:53	05/09/2018 20:12	167	3425		5029	0.0111	17.5	0.4	0.29	OK
26		473	05/08/2018 10:38	05/09/2018 10:56	05/09/2018 20:22	33	3425		5532	0.0111	106.21	0.9	1.47	OK
27		465	05/08/2018 10:44	05/09/2018 11:03	05/09/2018 20:08	84	3425		5059	0.0111	36.86	0.6	0.56	OK
28		104	05/08/2018 10:51	05/09/2018 11:08	05/09/2018 20:06	68	3425		5330	0.0111	48.54	0.6	0.7	OK
29		414	05/08/2018 10:54	05/09/2018 11:18	05/09/2018 18:25	1200	3425		4682	0.0111	0.66	0.1	0.05	OK
30		434	05/08/2018 10:56	05/09/2018 11:19	05/09/2018 19:02	1131	3425		5333	0.0111	1.18	0.2	0.05	OK
31		256	05/08/2018 08:28	05/09/2018 09:48	05/09/2018 17:42	198	3425		5538	0.0111	15.41	0.4	0.24	OK
32		476	05/08/2018 08:50	05/09/2018 09:50	05/09/2018 17:19	124	3425	D	5638	0.0111	26.38	0.5	0.39	OK
32		476	05/08/2018 08:50	05/09/2018 09:50	05/09/2018 17:16	112	3425		5096	0.0111	26.39	0.5	0.41	OK
33		2	05/08/2018 08:54	05/09/2018 10:01	05/09/2018 17:30	31	3425		5524	0.0111	108.06	0.9	1.49	OK
34		480	05/08/2018 09:16	05/09/2018 10:07	05/09/2018 17:01	281	3425		5041	0.0111	9.35	0.3	0.17	OK
35		500	05/08/2018 09:27	05/09/2018 10:17	05/09/2018 17:07	33	3425		5091	0.0111	93.83	0.9	1.35	OK
36		445	05/08/2018 09:43	05/09/2018 10:24	05/09/2018 16:27	1200	3425		4758	0.0111	0.69	0.1	0.05	OK
37		475	05/08/2018 09:47	05/09/2018 10:32	05/09/2018 16:58	48	3425	D	5165	0.0111	64.91	0.7	0.94	OK
37		475	05/08/2018 09:47	05/09/2018 10:32	05/09/2018 16:57	51	3425		5325	0.0111	62.92	0.7	0.9	OK
38		437	05/08/2018 10:07	05/09/2018 10:37	05/09/2018 20:26	279	3425		6024	0.0111	12.02	0.3	0.19	OK
39		456	05/08/2018 10:16	05/09/2018 10:45	05/09/2018 15:51	552	3425		5382	0.0111	4.27	0.2	0.09	OK
40		405	05/08/2018 10:32	05/09/2018 10:52	05/09/2018 20:17	29	3425		6200	0.0111	135.77	1	1.76	OK
40		405	05/08/2018 10:32	05/09/2018 10:52	05/09/2018 20:18	25	3425	D	5274	0.0111	133.96	1.1	1.88	OK

Types: D-Duplicate, TB-Trip Blank

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Radon Flux Measurements

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM, 87113

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
41		457	05/08/2018 10:35	05/09/2018 10:58	05/09/2018 20:21	24	3425		7058	0.0111	187.05	1.1	2.26	OK
42		441	05/08/2018 10:45	05/09/2018 11:01	05/09/2018 20:10	95	3425		8731	0.0111	57.35	0.5	0.64	OK
43		462	05/08/2018 10:50	05/09/2018 11:10	05/09/2018 20:19	46	3425		5296	0.0111	72.12	0.8	1.03	OK
44		429	05/08/2018 11:01	05/09/2018 11:17	05/09/2018 18:22	159	3425		5630	0.0111	20.64	0.4	0.31	OK
45		493	05/08/2018 10:57	05/09/2018 11:20	05/09/2018 19:44	1200	3425		3868	0.0111	0.24	0.1	0.05	OK
46		477	05/08/2018 10:58	05/09/2018 11:22	05/09/2018 19:24	1200	3425		4116	0.0111	0.37	0.1	0.05	OK
47		485	05/08/2018 12:50	05/09/2018 13:15	05/09/2018 23:23	58	3425	D	6640	0.0111	72.02	0.7	0.92	OK
47		485	05/08/2018 12:50	05/09/2018 13:15	05/09/2018 23:22	52	3425		5930	0.0111	71.72	0.7	0.97	OK
48		94	05/08/2018 12:49	05/09/2018 13:07	05/09/2018 22:42	45	3425		5056	0.0111	70.66	0.8	1.03	OK
49		467	05/08/2018 12:34	05/09/2018 13:03	05/09/2018 22:07	219	3425		5756	0.0111	14.96	0.3	0.23	OK
50		422	05/08/2018 12:32	05/09/2018 12:52	05/09/2018 22:54	983	3425		5039	0.0111	1.47	0.2	0.06	OK
51		489	05/08/2018 12:17	05/09/2018 12:47	05/09/2018 21:03	138	3425		5270	0.0111	22.41	0.4	0.35	OK
52		403	05/08/2018 12:11	05/09/2018 12:36	05/09/2018 20:31	79	3425		5078	0.0111	38.97	0.6	0.58	OK
53		482	05/08/2018 11:59	05/09/2018 12:32	05/09/2018 20:58	82	3425		9194	0.0111	69.25	0.6	0.75	OK
54		496	05/08/2018 11:57	05/09/2018 12:23	05/09/2018 20:56	130	3425		5108	0.0111	23.22	0.5	0.36	OK
55		478	05/08/2018 11:49	05/09/2018 12:18	05/10/2018 00:21	356	3425		6037	0.0111	9.21	0.3	0.15	OK
56		479	05/08/2018 11:48	05/09/2018 12:12	05/10/2018 00:09	705	3425		5008	0.0111	2.78	0.2	0.08	OK
57		417	05/08/2018 11:39	05/09/2018 12:09	05/09/2018 21:59	73	3425		5083	0.0111	42.85	0.6	0.64	OK
58		440	05/08/2018 11:30	05/09/2018 12:02	05/09/2018 21:34	487	3425		5022	0.0111	4.77	0.2	0.11	OK
59		406	05/08/2018 11:22	05/09/2018 11:58	05/09/2018 18:13	39	3425		6419	0.0111	100.64	0.8	1.29	OK
60		200	05/08/2018 11:19	05/09/2018 11:49	05/09/2018 17:51	77	3425		5202	0.0111	40.35	0.6	0.6	OK
61		420	05/08/2018 11:08	05/09/2018 11:35	05/09/2018 18:11	74	3425		7925	0.0111	65.4	0.6	0.76	OK

Types: D-Duplicate, TB-Trip Blank

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Radon Flux Measurements

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM, 87113

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
62		492	05/08/2018 11:11	05/09/2018 11:28	05/09/2018 18:05	340	3425		6534	0.0111	10.33	0.3	0.16	OK
63		1	05/08/2018 12:52	05/09/2018 13:14	05/09/2018 23:16	315	3425		5280	0.0111	8.98	0.3	0.16	OK
64		461	05/08/2018 12:47	05/09/2018 13:08	05/09/2018 22:16	185	3425		5033	0.0111	15.63	0.4	0.26	OK
65		64	05/08/2018 12:36	05/09/2018 13:02	05/09/2018 20:34	294	3425		5149	0.0111	9.27	0.3	0.17	OK
66		455	05/08/2018 12:30	05/09/2018 12:54	05/09/2018 23:14	68	3425		5267	0.0111	48.23	0.6	0.7	OK
67		446	05/08/2018 12:20	05/09/2018 12:45	05/09/2018 20:47	185	3425		14491	0.0111	47.93	0.4	0.42	OK
68		449	05/08/2018 12:09	05/09/2018 12:37	05/09/2018 20:33	42	3425		5249	0.0111	77.34	0.8	1.1	OK
69		498	05/08/2018 12:00	05/09/2018 12:30	05/09/2018 21:06	73	3425		9860	0.0111	84.06	0.6	0.87	OK
70		468	05/08/2018 11:55	05/09/2018 12:24	05/09/2018 21:00	101	3425		8484	0.0111	51.62	0.5	0.59	OK
71		75	05/08/2018 11:50	05/09/2018 12:17	05/09/2018 21:43	95	3425		13645	0.0111	90.23	0.5	0.8	OK
72		450	05/08/2018 11:45	05/09/2018 12:13	05/10/2018 00:07	49	3425		5466	0.0111	70.93	0.8	1	OK
73		68	05/08/2018 11:41	05/09/2018 12:07	05/09/2018 22:02	20	3425		6890	0.0111	219.91	1.2	2.68	OK
74		419	05/08/2018 11:28	05/09/2018 12:03	05/09/2018 21:45	284	3425		5039	0.0111	9.52	0.3	0.17	OK
75		447	05/08/2018 11:24	05/09/2018 11:56	05/09/2018 17:57	280	3425		6227	0.0111	12.07	0.3	0.19	OK
76		428	05/08/2018 11:18	05/09/2018 11:51	05/09/2018 18:02	98	3425		7957	0.0111	48.82	0.5	0.58	OK
77		91	05/08/2018 11:15	05/09/2018 11:32	05/09/2018 18:16	274	3425		5438	0.0111	10.74	0.3	0.18	OK
78		5	05/08/2018 01:13	05/09/2018 11:30	05/09/2018 18:52	504	3425	D	8997	0.0111	7	0.2	0.09	OK
78		5	05/08/2018 01:13	05/09/2018 11:30	05/09/2018 18:47	319	3425		5772	0.0111	7.11	0.2	0.12	OK
79		408	05/08/2018 12:58	05/09/2018 13:19	05/09/2018 22:22	219	3425		5282	0.0111	13.64	0.4	0.23	OK
80		452	05/08/2018 12:55	05/09/2018 13:13	05/09/2018 22:44	435	3425		5006	0.0111	5.58	0.2	0.12	OK
81		443	05/08/2018 12:45	05/09/2018 13:09	05/09/2018 23:12	133	3425		5021	0.0111	22.52	0.5	0.36	OK
82		430	05/08/2018 12:38	05/09/2018 13:00	05/09/2018 22:20	49	3425		6765	0.0111	86.86	0.8	1.09	OK

Types: D-Duplicate, TB-Trip Blank

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Radon Flux Measurements

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM, 87113

Location Name	Field Type	Canister Number	Date/Time Deployment	Retrieval	Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	LLD	Error 1.00 S.D.	Remarks
82		430	05/08/2018 12:38	05/09/2018 13:00	05/09/2018 22:21	37	3425	D	5133	0.0111	87.3	0.9	1.26	OK
83		499	05/08/2018 12:29	05/09/2018 12:55	05/09/2018 22:32	26	3425		5146	0.0111	125.28	1.1	1.78	OK
83		499	05/08/2018 12:29	05/09/2018 12:55	05/09/2018 22:33	25	3425	D	5097	0.0111	129.12	1.1	1.85	OK
84		432	05/08/2018 12:24	05/09/2018 12:43	05/09/2018 20:54	66	3425		18808	0.0111	180.02	0.6	1.33	OK
85		21	05/08/2018 12:07	05/09/2018 12:39	05/09/2018 20:40	24	3425		5206	0.0111	135.32	1.1	1.91	OK
86		435	05/08/2018 12:02	05/09/2018 12:29	05/09/2018 21:12	37	3425		5122	0.0111	86.43	0.9	1.25	OK
86		435	05/08/2018 12:02	05/09/2018 12:29	05/09/2018 21:13	100	3425	D	13537	0.0111	84.49	0.5	0.75	OK
87		416	05/08/2018 11:54	05/09/2018 12:25	05/09/2018 21:08	191	3425		5246	0.0111	15.65	0.4	0.25	OK
88		436	05/08/2018 11:52	05/09/2018 12:16	05/09/2018 21:51	268	3425		5012	0.0111	10.19	0.3	0.18	OK
89		431	05/08/2018 11:44	05/09/2018 12:14	05/09/2018 21:32	54	3425		10844	0.0111	126.52	0.7	1.24	OK
90		488	05/08/2018 11:42	05/09/2018 12:06	05/09/2018 22:02	105	3425		5210	0.0111	30.14	0.5	0.46	OK
91		448	05/08/2018 11:27	05/09/2018 12:05	05/09/2018 21:56	176	3425		5030	0.0111	16.43	0.4	0.27	OK
92		401	05/08/2018 11:25	05/09/2018 11:55	05/09/2018 18:14	86	3425		5383	0.0111	37.33	0.6	0.55	OK
93		411	05/08/2018 11:17	05/09/2018 11:53	05/09/2018 17:53	80	3425		5354	0.0111	39.79	0.6	0.58	OK
93		411	05/08/2018 11:17	05/09/2018 11:53	05/09/2018 17:55	77	3425	D	5131	0.0111	39.62	0.6	0.59	OK
94		439	05/08/2018 12:56	05/09/2018 13:12	05/09/2018 22:27	296	3425		5018	0.0111	9.09	0.3	0.17	OK
95		42	05/08/2018 12:43	05/09/2018 13:10	05/09/2018 22:52	121	3425		5021	0.0111	24.82	0.5	0.39	OK
96		453	05/08/2018 12:41	05/09/2018 12:58	05/09/2018 22:11	239	3425		5107	0.0111	11.92	0.3	0.21	OK
97		410	05/08/2018 12:26	05/09/2018 12:56	05/09/2018 22:35	389	3425		5301	0.0111	6.91	0.3	0.13	OK
98		407	05/08/2018 12:25	05/09/2018 12:42	05/09/2018 20:51	64	3425		8093	0.0111	78.95	0.7	0.91	OK
98		407	05/08/2018 12:25	05/09/2018 12:42	05/09/2018 20:52	53	3425	D	6620	0.0111	77.97	0.7	0.99	OK
99		105	05/08/2018 12:06	05/09/2018 12:40	05/09/2018 20:41	316	3425		5996	0.0111	10.18	0.3	0.17	OK

Types: D-Duplicate, TB-Trip Blank

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Radon Flux Measurements

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8809 Washington St. NE, Suite 150
Albuquerque, NM, 87113

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
100		254	05/08/2018 12:04	05/09/2018 12:27	05/09/2018 21:15	977	3425		6853	0.0111	2.66	0.2	0.06	OK
	TB	49	05/08/2018 12:59	05/09/2018 13:20	05/09/2018 23:25	1200	3425		3823	0.0111	0.21	0.1	0.05	OK
	TB	495	05/08/2018 13:00	05/09/2018 13:21	05/09/2018 23:46	1200	3425		3889	0.0111	0.25	0.1	0.05	OK

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Radon Flux Measurements

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM, 87113

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
1		462	05/15/2018 09:59	05/16/2018 11:45	05/17/2018 12:53	1115	3308		5205	0.011	1.33	0.2	0.06	OK
2		473	05/15/2018 09:31	05/16/2018 11:20	05/16/2018 17:52	653	3308		5457	0.011	3.38	0.2	0.08	OK
3		411	05/15/2018 09:29	05/16/2018 11:19	05/16/2018 17:37	430	3308		6564	0.011	7.53	0.2	0.12	OK
4		465	05/15/2018 09:57	05/16/2018 11:32	05/17/2018 07:46	1088	3308		11221	0.011	5.1	0.2	0.07	OK
4		465	05/15/2018 09:57	05/16/2018 11:32	05/17/2018 08:06	505	3308	D	5188	0.011	5.08	0.2	0.11	OK
5		94	05/15/2018 09:55	05/16/2018 11:31	05/17/2018 08:24	551	3308		5769	0.011	5.23	0.2	0.11	OK
6		478	05/15/2018 09:33	05/16/2018 11:21	05/16/2018 18:55	483	3308		6436	0.011	6.43	0.2	0.11	OK
7		409	05/15/2018 09:27	05/16/2018 11:19	05/16/2018 17:33	123	3308		5695	0.011	26.16	0.4	0.38	OK
8		91	05/15/2018 09:05	05/16/2018 11:09	05/16/2018 16:55	45	3308		5374	0.011	69.36	0.7	0.98	OK
9		415	05/15/2018 10:19	05/16/2018 11:45	05/17/2018 08:34	630	3308		5107	0.011	3.65	0.2	0.09	OK
10		495	05/15/2018 10:18	05/16/2018 11:44	05/17/2018 11:37	1068	3308		6380	0.011	2.24	0.2	0.06	OK
10		495	05/15/2018 10:18	05/16/2018 11:44	05/17/2018 11:58	993	3308	D	5891	0.011	2.22	0.2	0.07	OK
11		412	05/15/2018 10:03	05/16/2018 11:33	05/17/2018 07:40	289	3308		5060	0.011	9.97	0.3	0.18	OK
12		471	05/15/2018 09:53	05/16/2018 11:30	05/17/2018 08:20	177	3308		5051	0.011	17.45	0.4	0.28	OK
13		402	05/15/2018 09:35	05/16/2018 11:22	05/16/2018 18:13	417	3308		5008	0.011	5.6	0.2	0.11	OK
14		425	05/15/2018 09:25	05/16/2018 11:17	05/16/2018 18:08	235	3308	D	5363	0.011	12.11	0.3	0.2	OK
14		425	05/15/2018 09:25	05/16/2018 11:17	05/16/2018 18:04	222	3308		5021	0.011	11.98	0.3	0.2	OK
15		414	05/15/2018 09:07	05/16/2018 11:10	05/16/2018 16:57	53	3308		5133	0.011	55.98	0.7	0.82	OK
16		437	05/15/2018 09:03	05/16/2018 11:08	05/16/2018 17:14	91	3308		5055	0.011	31.45	0.5	0.48	OK
16		437	05/15/2018 09:03	05/16/2018 11:08	05/16/2018 17:16	120	3308	D	6445	0.011	30.36	0.4	0.41	OK
17		451	05/15/2018 10:31	05/16/2018 11:56	05/17/2018 14:01	733	3308		5009	0.011	2.89	0.2	0.08	OK
18		452	05/15/2018 10:21	05/16/2018 11:46	05/17/2018 10:58	781	3308		18693	0.011	14.71	0.2	0.13	OK

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Radon Flux Measurements

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM, 87113

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
19		461	05/15/2018 10:17	05/16/2018 11:42	05/17/2018 11:26	550	3308		16302	0.011	18.74	0.2	0.17	OK
20		486	05/15/2018 10:05	05/16/2018 11:35	05/16/2018 18:50	223	3308		5558	0.011	13.6	0.3	0.22	OK
21		405	05/15/2018 09:50	05/16/2018 11:29	05/17/2018 08:16	164	3308		5062	0.011	19	0.4	0.31	OK
22		459	05/15/2018 09:37	05/16/2018 11:23	05/16/2018 18:33	343	3308		8095	0.011	12.66	0.3	0.17	OK
23		479	05/15/2018 09:23	05/16/2018 11:17	05/16/2018 17:45	433	3308		7378	0.011	8.59	0.2	0.13	OK
24		434	05/15/2018 09:09	05/16/2018 11:11	05/16/2018 16:59	417	3308		6965	0.011	8.31	0.2	0.13	OK
25		477	05/15/2018 09:00	05/16/2018 11:08	05/16/2018 16:53	94	3308		5570	0.011	33.51	0.5	0.48	OK
26		426	05/15/2018 08:50	05/16/2018 11:00	05/16/2018 16:13	957	3308		5750	0.011	1.92	0.1	0.06	OK
27		481	05/15/2018 10:41	05/16/2018 12:02	05/17/2018 14:31	874	3308		5313	0.011	2.37	0.2	0.07	OK
28		256	05/15/2018 10:32	05/16/2018 11:57	05/17/2018 13:27	372	3308		7288	0.011	11.89	0.3	0.17	OK
29		430	05/15/2018 10:29	05/16/2018 11:55	05/17/2018 13:20	409	3308		5003	0.011	6.68	0.3	0.14	OK
30		450	05/15/2018 10:23	05/16/2018 11:47	05/17/2018 09:47	1200	3308		19457	0.011	9.27	0.2	0.09	OK
31		441	05/15/2018 10:16	05/16/2018 11:41	05/17/2018 13:12	409	3308		9637	0.011	14.7	0.3	0.18	OK
32		49	05/15/2018 10:06	05/16/2018 11:36	05/17/2018 07:34	192	3308		5903	0.011	18.9	0.4	0.28	OK
33		428	05/15/2018 09:48	05/16/2018 11:29	05/17/2018 09:43	177	3308		5051	0.011	17.59	0.4	0.29	OK
34		406	05/15/2018 09:39	05/16/2018 11:24	05/16/2018 18:40	287	3308		6148	0.011	11.35	0.3	0.18	OK
35		469	05/15/2018 09:21	05/16/2018 11:16	05/16/2018 18:26	353	3308		8737	0.011	13.29	0.3	0.17	OK
36		493	05/15/2018 09:12	05/16/2018 11:11	05/16/2018 17:29	202	3308		5034	0.011	13.27	0.3	0.22	OK
37		492	05/15/2018 08:58	05/16/2018 11:07	05/16/2018 17:07	369	3308		7436	0.011	10.33	0.2	0.15	OK
38		447	05/15/2018 08:52	05/16/2018 11:00	05/16/2018 16:30	885	3308		5075	0.011	1.76	0.2	0.06	OK
39		420	05/15/2018 08:47	05/16/2018 10:59	05/16/2018 16:46	50	3308	D	5155	0.011	59.39	0.7	0.86	OK
39		420	05/15/2018 08:47	05/16/2018 10:59	05/16/2018 16:45	51	3308		5138	0.011	57.99	0.7	0.84	OK

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Radon Flux Measurements

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Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	ELD	Error 1.00 S.D.	Remarks
40		422	05/15/2018 10:42	05/16/2018 12:03	05/17/2018 15:18	438	3308		5833	0.011	7.58	0.3	0.14	OK
40		422	05/15/2018 10:42	05/16/2018 12:03	05/17/2018 15:26	476	3308	D	6446	0.011	7.75	0.3	0.13	OK
41		453	05/15/2018 10:39	05/16/2018 12:02	05/17/2018 15:05	716	3308		8287	0.011	6.31	0.2	0.1	OK
42		467	05/15/2018 10:33	05/16/2018 11:55	05/17/2018 12:36	995	3308		11204	0.011	5.98	0.2	0.08	OK
43		499	05/15/2018 10:28	05/16/2018 11:54	05/17/2018 13:41	342	3308		5020	0.011	8.43	0.3	0.16	OK
44		424	05/15/2018 10:24	05/16/2018 11:48	05/17/2018 12:16	1090	3308		23580	0.011	13.25	0.2	0.1	OK
45		457	05/15/2018 10:09	05/16/2018 11:40	05/17/2018 11:13	623	3308		11144	0.011	10.5	0.2	0.13	OK
46		484	05/15/2018 10:08	05/16/2018 11:36	05/16/2018 18:45	254	3308		5279	0.011	11.06	0.3	0.19	OK
47		104	05/15/2018 09:43	05/16/2018 11:28	05/17/2018 08:45	1200	3308		17153	0.011	7.81	0.2	0.08	OK
48		200	05/15/2018 09:41	05/16/2018 11:25	05/16/2018 19:09	537	3308	D	11594	0.011	11.5	0.2	0.13	OK
48		200	05/15/2018 09:41	05/16/2018 11:25	05/16/2018 19:04	251	3308		5379	0.011	11.4	0.3	0.19	OK
49		421	05/15/2018 09:19	05/16/2018 11:15	05/16/2018 18:20	252	3308		6526	0.011	13.96	0.3	0.2	OK
50		429	05/15/2018 09:14	05/16/2018 11:12	05/16/2018 17:25	201	3308		5020	0.011	13.3	0.3	0.22	OK
51		5	05/15/2018 08:57	05/16/2018 11:06	05/16/2018 17:18	366	3308		6131	0.011	8.33	0.2	0.14	OK
52		433	05/15/2018 08:54	05/16/2018 11:02	05/16/2018 16:49	152	3308		5017	0.011	17.95	0.4	0.29	OK
53		401	05/15/2018 08:44	05/16/2018 10:58	05/16/2018 16:48	38	3308		5210	0.011	79.45	0.8	1.13	OK
54		400	05/15/2018 10:48	05/16/2018 12:10	05/17/2018 16:26	700	3308		5127	0.011	3.3	0.2	0.09	OK
55		439	05/15/2018 10:46	05/16/2018 12:10	05/17/2018 16:05	489	3308		5049	0.011	5.45	0.3	0.12	OK
56		456	05/15/2018 10:43	05/16/2018 12:04	05/17/2018 13:47	764	3308		6587	0.011	4.16	0.2	0.09	OK
57		463	05/15/2018 10:37	05/16/2018 12:01	05/17/2018 14:47	416	3308		6635	0.011	9.41	0.3	0.15	OK
58		460	05/15/2018 10:34	05/16/2018 11:59	05/17/2018 14:26	231	3308	D	5381	0.011	14.61	0.4	0.24	OK
58		460	05/15/2018 10:34	05/16/2018 11:59	05/17/2018 14:22	251	3308		5724	0.011	14.25	0.4	0.23	OK

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8809 Washington St. NE, Suite 150
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Radon Flux Measurements

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
59		455	05/15/2018 10:27	05/16/2018 11:51	05/17/2018 14:14	467	3308		9383	0.011	12.33	0.3	0.16	OK
60		42	05/15/2018 10:25	05/16/2018 11:52	05/17/2018 13:34	364	3308		5011	0.011	7.78	0.3	0.15	OK
61		432	05/15/2018 11:53	05/16/2018 12:49	05/16/2018 21:10	774	3308		6677	0.011	3.71	0.2	0.08	OK
62		403	05/15/2018 11:50	05/16/2018 12:48	05/16/2018 20:31	994	3308		16629	0.011	8.78	0.2	0.09	OK
63		64	05/15/2018 11:49	05/16/2018 12:47	05/16/2018 20:49	1200	3308		6667	0.011	1.76	0.1	0.05	OK
64		496	05/15/2018 11:48	05/16/2018 12:46	05/16/2018 20:06	1056	3308		15417	0.011	7.42	0.2	0.08	OK
64		496	05/15/2018 11:48	05/16/2018 12:46	05/16/2018 20:24	342	3308	D	5087	0.011	7.6	0.3	0.14	OK
65		105	05/15/2018 11:46	05/16/2018 12:45	05/16/2018 19:51	767	3308		5456	0.011	2.72	0.2	0.07	OK
66		482	05/15/2018 11:45	05/16/2018 12:43	05/16/2018 19:47	34	3308		8797	0.011	159.81	0.9	1.73	OK
67		438	05/15/2018 10:49	05/16/2018 12:11	05/17/2018 15:49	828	3308		5009	0.011	2.37	0.2	0.07	OK
68		445	05/15/2018 10:45	05/16/2018 12:09	05/17/2018 15:41	361	3308		5989	0.011	9.93	0.3	0.17	OK
69		494	05/15/2018 10:44	05/16/2018 12:06	05/17/2018 14:55	603	3308		13210	0.011	13.69	0.2	0.14	OK
70		21	05/15/2018 11:57	05/16/2018 12:59	05/16/2018 19:32	459	3308		6993	0.011	7.74	0.2	0.12	OK
71		489	05/15/2018 11:55	05/16/2018 12:51	05/16/2018 19:21	590	3308		5309	0.011	3.89	0.2	0.09	OK
72		407	05/15/2018 11:44	05/16/2018 12:42	05/16/2018 20:05	53	3308		7095	0.011	82.05	0.7	1	OK
73		487	05/15/2018 10:51	05/16/2018 12:13	05/17/2018 16:17	463	3308		5653	0.011	6.82	0.3	0.13	OK
74		410	05/15/2018 10:53	05/16/2018 12:14	05/17/2018 16:39	74	3308		5036	0.011	47.24	0.7	0.71	OK
75		417	05/15/2018 11:40	05/16/2018 12:41	05/16/2018 19:48	112	3308		19459	0.011	106.6	0.5	0.78	OK
76		449	05/15/2018 11:38	05/16/2018 12:40	05/16/2018 19:42	42	3308		6054	0.011	88.03	0.8	1.16	OK
77		418	05/15/2018 10:57	05/16/2018 12:16	05/17/2018 16:14	88	3308		5046	0.011	39.4	0.6	0.6	OK
78		68	05/15/2018 11:37	05/16/2018 12:39	05/16/2018 19:40	21	3308		5132	0.011	150.43	1.1	2.14	OK
79		263	05/15/2018 10:58	05/16/2018 12:17	05/18/2018 10:40	287	3308		5210	0.011	12.77	0.4	0.22	OK

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Radon Flux Measurements

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	LLD	Error 1.00 S.D.	Remarks
80		448	05/15/2018 11:36	05/16/2018 12:38	05/16/2018 19:41	42	3308		5245	0.011	76.05	0.8	1.09	OK
81		408	05/15/2018 11:00	05/16/2018 12:17	05/17/2018 17:02	69	3308		5039	0.011	51.09	0.7	0.76	OK
81		408	05/15/2018 11:00	05/16/2018 12:17	05/17/2018 17:04	69	3308	D	5054	0.011	51.26	0.7	0.76	OK
82		468	05/15/2018 11:35	05/16/2018 12:37	05/16/2018 19:44	53	3308		9561	0.011	110.68	0.7	1.16	OK
83		474	05/15/2018 11:02	05/16/2018 12:18	05/18/2018 10:04	428	3308		5054	0.011	7.49	0.3	0.15	OK
84		488	05/15/2018 11:31	05/16/2018 12:35	05/18/2018 09:27	82	3308		5029	0.011	48.47	0.7	0.73	OK
85		446	05/15/2018 11:32	05/16/2018 12:37	05/18/2018 09:54	61	3308		10312	0.011	137.96	0.9	1.39	OK
86		470	05/15/2018 11:03	05/16/2018 12:19	05/17/2018 16:41	1200	3308		4131	0.011	0.5	0.2	0.05	OK
87		80	05/15/2018 11:29	05/16/2018 12:35	05/18/2018 09:24	60	3308		5162	0.011	68.8	0.9	1.01	OK
88		423	05/15/2018 11:05	05/16/2018 12:20	05/18/2018 11:06	1084	3308		5005	0.011	1.55	0.2	0.07	OK
89		472	05/15/2018 11:27	05/16/2018 12:34	05/18/2018 09:52	36	3308		5098	0.011	115.07	1.1	1.66	OK
90		2	05/15/2018 11:07	05/16/2018 12:23	05/18/2018 12:04	52	3308	D	5115	0.011	80.23	0.9	1.17	OK
90		2	05/15/2018 11:07	05/16/2018 12:23	05/18/2018 12:03	53	3308		5148	0.011	79.19	0.9	1.15	OK
91		458	05/15/2018 11:25	05/16/2018 12:32	05/18/2018 09:45	422	3308		5014	0.011	7.56	0.3	0.15	OK
92		475	05/15/2018 11:09	05/16/2018 12:23	05/18/2018 11:46	1002	3308		8258	0.011	4.6	0.2	0.09	OK
93		480	05/15/2018 11:11	05/16/2018 12:24	05/18/2018 11:25	1200	3308		5226	0.011	1.34	0.2	0.06	OK
94		490	05/15/2018 11:12	05/16/2018 12:25	05/18/2018 12:15	272	3308		5222	0.011	13.84	0.4	0.24	OK
95		4	05/15/2018 11:15	05/16/2018 12:26	05/18/2018 12:20	216	3308		6204	0.011	21.9	0.5	0.32	OK
96		476	05/15/2018 11:16	05/16/2018 12:27	05/18/2018 12:06	488	3308		88098	0.011	149.67	0.3	0.52	OK
97		483	05/15/2018 11:18	05/16/2018 12:28	05/18/2018 12:25	366	3308		14098	0.011	30.19	0.3	0.28	OK
98		312	05/15/2018 11:20	05/16/2018 12:29	05/18/2018 12:31	377	3308		10893	0.011	22.09	0.3	0.24	OK
99		500	05/15/2018 11:22	05/16/2018 12:30	05/18/2018 09:57	286	3308		7741	0.011	20.16	0.4	0.27	OK

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Radon Flux Measurements

Location Name	Field Type	Canister Number	Date/Time Deployment	Date/Time Retrieval	Date/Time Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m²s) Result	Flux (pCi/m²s) LLD	Flux (pCi/m²s) Error 1.00 S.D.	Remarks
100		427	05/15/2018 11:24	05/16/2018 12:31	05/18/2018 09:44	38	3308		5123	0.011	109.37	1.1	1.58	OK
	TB	436	05/15/2018 12:00	05/16/2018 12:00	05/17/2018 07:12	1200	3308		3359	0.011	0.03	0.2	0.05	OK
	TB	75	05/15/2018 12:00	05/16/2018 12:00	05/17/2018 06:50	1200	3308		3378	0.011	0.04	0.2	0.05	OK

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Appendix B

Field Deployment and Laboratory Analysis Log Forms

ERG Canister Deployment and Retrieval Log Form

Site: HMC STP

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
53	401	05/15/18	0844	05/16/18	1058	
39	480		0847		1059	CAN #420
26	426		0850		1100	
38	447		0852		1100	
52	433		0854		1102	
* 51	5		0857		1106	
37	492		0858		1107	
25	477		0900		1108	
16	437		0903		1108	
8	91		0905		1109	
15	414		0907		1110	
24	434		0909		1111	
* 36	493		0912		1111	
50	429		0914		1112	
* 49	421		0919		1115	
35	469		0921		1116	
23	479		0923		1117	
14	425		0925		1117	
7	409		0927		1119	
3	411		0929		1119	
2	473		0931		1120	
6	478		0933		1121	
13	402		0935		1122	
22	459		0937		1123	
34	406		0939		1124	
48	200		0941		1125	
* 47	104		0943		1128	
33	428		0948		1129	
21	405		0950		1129	
12	471		0953		1130	

ONSITE MET STATION: 2C = 36°F MRN
0 PRECIPITATION
ER

Review:

ERG Canister Deployment and Retrieval Log Form

Site: LHMC STP

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
5	94	05/15/18	09:55	05/16/18	1131	
4	~~456~~ 465		09:57		1132	#465 CAN
1	462		09:59		1145	
11	412		10:03		1133	
20	486		10:05		1135	
32	49		10:06		1136	
46	484		10:08		1136	
* 45	457		10:09		1140	
31	441		10:16		1141	
19	461		10.17		1142	
10	493		10:18		1144	
9	415		10:19		1145	
18	452		10:21		1146	
(30)	~~448~~ 450		10:23		~~1147~~ 1147	# 30 LOCATION
44	424		10:24		1148	
60	42		10:25		1152	
* 59	455		10:27		1151	
43	499		10:28		1154	
29	430		10:29		1155	
17	451		10:31		1156	
28	236		10:32		1157	
42	467		10:33		1155	
58	460		10:34		1159	
* 57	463		10:37		1201	
41	453		10:39		1202	
27	481		10:41		1202	
40	422		10:42		1203	
56	456		10:43		1204	
69	494		10:44		1206	
68	445		10:45		1209	

Review: _____

ERG Canister Deployment and Retrieval Log Form

Site: HMC STP

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
55	439	05/15/18	10:46	05/16/18	1210	
54	400		10:48		1210	
67	438		10:49		1211	
73	487		10:51		1213	
74	410		10:53		1214	
77	418		10:57		1216	
79	263		10:58		1217	
81	408		11:00		1217	
83	474		11:02		1218	
86	470		11:03		1219	
88	423		11:05		1220	
90	2		11:07		1223	
92	475		11:09		1223	
93	480		11:11		1224	
94	490		11:12		1225	
95	4		11:15		1226	
96	476		11:16		1227	
97	483		11:18		1228	
98	312		11:20		1229	
99	500		11:22		1230	
100	427		11:24		1231	
91	458		11:25		1232	
89	472		11:27		1234	
87	80		11:29		1235	
84	488		11:31		1235	
85	446		11:32		1237	
82	468		11:35		1237	
80	448		11:36		1238	
78	68		11:37		1239	
76	449		11:38		1240	

Review: [signature]

Canister Deployment and Retrieval Log Form

Site: HMC STP

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
75	417	05/17/18	11:40	05/16/18	1241	
72	407		11:44		1242	
66	482		11:45		1243	
65	105		11:46		1245	
64	496		11:48		1246	
63	64		1149		1247	
62	403		11:50		1248	
61	432		11:53		1249	
71	489		11:55		1251	
70	21		11:57		1259	
Controls						
	436		12:00		12:00	
	75		12:00		12:00	
		TMP	BLANKS			

Review: _____

ERG Canister Analysis Log Form

Site: HMC STP 2018
ROI: Channel 393 to Channel 483

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts 40585	Technician Initials
STD 3A		05/16/18	15:08	1200	~~37888~~	cf
STD 2A			15:29	1200	44145	cf
BKG A			15:50	1200	3053	JH
426			16 13	957	5750	
447			1630	885	5075	
420			1645	51	5138	
420 B	✓		1646	50	5155	
401			1648	38	5210	
433			1649	152	5017	
477			1653	94	5570	
91			1655	45	5374	
414			1657	53	5133	
434			1659	417	6965	
492			1707	369	7436	
437			1714	91	5055	
437 B	✓		1716	120	6445	
5			1718	366	6131	
429			1725	201	5020	
493			1729	202	5034	
409			1733	123	5695	
411			1737	430	6564	
479			1745	433	7378	
473			1752	653	5457	
425			1804	222	5021	
425 B	✓		1808	235	5363	
402			1813	417	5008	
421			1820	252	~~6226~~ 6526	
469			1826	353	8737	
459			1833	343	8095	

Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC STP 2018
ROI: Channel 393 to Channel 483

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
406		05/16/18	1840	287	6148	JDH
484			1845	254	5279	
486			~~1852~~ 1850	~~275~~ 223	5558	
478			1855	483	6436	
200			1904	251	5379	
200 B	✓		1909	537	11594	
489			1921	590	5309	
21			1932	459	6993	
68			1940	21	5132	
448			1941	42	5245	
449			1942	42	6054	
468			1944	53	9561	
482			1947	34	8797	
417			1948	112	19459	
105			1951	767	5456	
407			2005	53	7095	
496			2006	1056	15417	
496 B	✓		2024	342	5087	
403			2031	994	16629	
64			2049	1200	6667	
432			2110	774	6677	
3K4 B			2124	1200	3312	
STD 3B			2145	1200	39310	
STD 1B			~~2211~~ 2207	1200	42961	ESH
STD 1C		05/17/18	0537	1200	42717	ESH
STD 3C			0558	1200	41571	
BKGC			0626	1200	3353	
75			0650	1200	3378	
436			0712	1200	3359	

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Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC STP 2018
ROI: Channel 393 to Channel 483

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
49		05/17/18	0734	192	5903	ESH
412			0740	289	5060	
465			0746	1088	11221	
465 b	✓		0806	505	5188	
405			0816	164	5062	
471			0820	177	5051	
94			0824	551	5769	
415			0834	630	5107	
104			0845	1200	17153	
428			0943	177	5051	
450			0947	1200	19457	
452			1058	781	18693	
457			1113	623	11144	
461			1126	550	16302	DN
495	~~✓~~ TH		1137	1,068	6380	DN
495 b	✓		1158	993	5891	DN
424			1216	1090	23580	DN
467			1236	995	11204	
462			1253	1115	5205	
441			1312	409	9637	
430			1320	409	5003	
256			1327	372	7288	
42			1334	364	5041	
499			1341	342	5020	
456			1347	764	6587	
451			1401	733	5009	
455			1414	467	9383	
460			1422	251	5724	
460 b	✓		1426	231	5381	

210 3.5hrs

Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC STP 2018
ROI: Channel 393 to Channel 483

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
481		05/17/18	1431	874	5313	JDH
463			1447	416	6635	
494			1455	603	13210	
453			1505	716	8287	
422			1518	438	5833	
422 B	✓		1526	476	6446	
445			1541	361	5989	DN
438			1549	828	5009	
439			1605	489	5049	
418			1614	88	5046	
487			1617	463	5653	
400			1626	700	5127	
410			1639	74	5036	
470			1641	1200	4131	
408			1702	69	5039	
408 B	✓		1704	69	5054	
STD 3D		05/18/18	0817	1200	41393	JDH
STD 1D			0837	1200	44490	
BKG D			0900	1200	3656	
80			0924	60	5162	
488			0927	82	5029	
427			0944	38	5123	
458			0945	422	5014	
472			0952	36	5098	
446			0954	61	10312	
500			0957	286	7741	
474			1004	428	5054	
~~460~~			~~1026~~	~~286~~	~~5156~~	JH
423			1106	1084	5005	

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Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC STP 2018
ROI: Channel 393 to Channel 483

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
480		05/18/18	11 25	1200	5226	JH MSRay
475			11 46	1002	8258	
2			1203	53	5148	
2 B	✓		1204	52	5115	
476			1206	488	88098	
490			1215	272	5222	
4			1220	216	6204	
483			1225	366	14098	
312			1231	377	10893	
STO3E			1238	1200	41214	
STD1E			1346	1200	42672	
BKG E			1410	1200	3166	
263			1040	287	5210	

Review: CJ Date: 6/14/18

ERG Form PWT.107.B

Canister Analysis Log Form

Site: HMC LTP
ROI: Channel 382 to Channel 472

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
STD #1A		05/09/18	1328	1200	44721	JDH
STD 3A			1349	1200	41597	JF
BKG A			14:26	1200	3331	JDH
456			1551	552	5382	JDH
438			1603	91	5193	JDH
438 B	✓		1605	92	5194	JDH
481			1607	1008	6677	JDH
451			1626	29	5326	JDH
445			1627	1200	4758	JDH
263			1650	89	5106	JDH
400			1653	30	5439	JDH
463			1654	42	5289	JDH
472			1656	28	5287	
475			1657	51	5325	
475 B	✓		1658	48	5165	
483			1700	42	5175	
480			1701	281	5041	
500			1707	33	5091	
80			~~150~~ 1708	35	5190	
470			1709	46	5211	
490			1711	28	5742	
312			1712	46	5182	
458			1714	58	5639	
4			1716	22	5285	
476			1716	112	5096	
476 B	✓		1719	124	5638	
~~472~~ 427			1722	310	5033	
474			1728	49	7864	
2			1730	31	5524	

Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC LTP

ROI: Channel 382 to Channel 472

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
423		05/09/18	1732	134	5546	JDH
494			1735	323	5521	
256			1742	198	5538	
418			1746	81	5155	
487			1748	94	5080	
200			1751	72	5202	
411			1753	80	5354	
411 D	✓		1755	77	5131	
447			1757	280	6227	
428			1802	98	7957	
492			1805	340	6534	
420			1811	74	7925	
406			1813	39	6419	
401			1814	86	5383	
91			1816	274	5438	
429			1822	159	5630	
414			1825	1200	4682	
5			1847	319	~~5725~~ 5772	
5 D	✓		1852	504	8997	
434			1902	1131	5333	
426			1922	80	5211	
477			1924	1200	4116	
493			1944	1200	3868	
425			2005	26	5101	
104			2006	68	5330	
465 465			2008	84	5059	
441			2010	95	8731	
486			2012	167	5029	
433			2016	29	5342	

Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC LTP
ROI: Channel 382 to Channel 472

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
405		05/09/18	2017	29	6200	JDH
405 D	✓		2018	25	5274	
462			2019	46	5296	
~~455~~ 457			2021	24	7058	
473			2022	33	5532	
469			2023	123	5018	
437			2026	279	6024	
403			2031	79	5078	
449			2033	42	5249	
64			2034	294	5149	
21			2040	24	5206	
105			2041	316	5996	
446			2047	185	14491	
407			2051	64	8093	
407 D	✓		2052	53	6620	
432			2054	66	18808	
496			2056	130	5108	
482			2058	82	9194	
468			2100	101	8484	
489			2103	138	5270	
498			2106	73	9860	
416			2108	191	5246	
435			2112	37	5122	
435 D	✓		2113	100	13537	
254			2115	977	6853	
431			2132	54	10844	
440			2134	487	5022	
75			~~2~~ 2143	95	13645	
419			2145	284	5039	

Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC LTP

ROI: Channel 382 to Channel 472

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
436		05/09/18	2151	268	5012	JDH
448			2156	176	5030	
417			2159	73	5083	
68			2202	20	6890	
488			2202	105	5210	
467			2207	219	5756	
453			2211	239	5107	
461			2216	185	5033	
430			2220	49	6765	
430 B	✓		2221	37	5133	
408			2222	219	5282	
439			2227	296	5018	
499			2232	26	5146	
499 B	✓		2233	25	5097	
410			2235	389	5301	
94			2242	45	5056	
452			2244	435	5006	
42			02252	121	5021	
422			2254	983	5039	
443			2312	133	5021	
455			2314	68	5267	
1			2316	315	5280	
485			2322	52	5930	
485 B	✓		2323	58	6640	
49			2325	1200	3823	
495			2346	1200	3889	
450		05/10/18	0007	49	5466	
479		05/10/18	0009	705	5008	
478		05/10/18	0021	356	6037	

Review: _____ Date: 6/14/18

ERG Canister Analysis Log Form

Site: HMC LTP
ROI: Channel 382 to Channel 472

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
STD1B		05/10/18	0028	1200	43112	JDH
STD3B		"	0049	1200	41121	"
BKGB		"	0111	1200	3519	"

Review: [signature]

Date: 6/14/18

Attachment 4
Environmental Gamma Radiation Results

Attachment 4 - Environmental Gamma Radiation Results
OSL Perimeter Survey

Direct Radiation Measurements

Location	Monitoring Period	Dose Rate (mrem/6 mo)	Error (mrem/6 mo)*
HMC #1 N Outer Perimeter	7/1/17 - 12/31/17	61	6.0
HMC #1-A N Outer Perimeter	7/1/17 - 12/31/17	60	5.9
HMC #2 NE Outer Perimeter	7/1/17 - 12/31/17	63	6.2
HMC #3 E Outer Perimeter	7/1/17 - 12/31/17	59	5.8
HMC #4 S Outer Perimeter	7/1/17 - 12/31/17	69	6.8
HMC #5 N of Nearest Residence	7/1/17 - 12/31/17	66	6.5
HMC #6 Background	7/1/17 - 12/31/17	65	6.4
HMC #16	7/1/17 - 12/31/17	54	5.3

*Error is 1.96 std. dev.