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August 26, 2022

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RE: 1st Half 2022 Semi-Annual Environmental Monitoring Report for Period January - July 2022, In Accordance with Nuclear Regulatory Commission Docket No. 40-8903, License No. SUA 1471, and New Mexico Environment Department DP-200 Ground Water Discharge Plan

Mr. Linton and Ms. Maurer:

Pursuant to US Nuclear Regulatory Commission License SUA-1471, Docket 40-8903, License Condition 35(E) and in accordance with the ground water discharge permit DP-200 issued by the New Mexico Environment Department, please find below a hyperlink to the Semi-Annual Environmental Monitoring Report for the first half of 2022 (January-June) for Homestake Mining Company's Grants Reclamation Project.

<https://app.box.com/s/51c82gyrm1cxzeyvp5cx0b1dre7eyzy>

Thank you for your time and attention on this matter. If you have any questions, please contact me via e-mail at bbingham@homestakeminingcoca.com or via phone at 505.290.8019.

Respectfully,

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HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project



SEMIANNUAL ENVIRONMENTAL MONITORING REPORT

**Reporting Period
January- June 2022**

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

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1.0 INTRODUCTION

This Semiannual Environmental Monitoring Report summarizes effluent monitoring data recorded for Homestake Mining Company of California - Grants Project (Homestake) from January through June 2022. 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 (ML12293A170) and approved by the NRC on January 28, 1999 (ML080030067). The large tailings pile (LTP) has been re-contoured and covered with an interim cover on the top and radon barrier on the outcrops. Bedding and erosion protection was placed on the outcrops 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 (ML12291A911) and approved by the NRC on January 28, 1999 (ML080030067).

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 (LC)35, continued throughout the report period. The requirements set forth in LC 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 groundwater corrective action program (GCAP) 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 semiannual reporting, groundwater-monitoring data for the point-of-compliance (POC) wells, pond monitoring wells DD, DD2 and X and background well P are included.

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 particulates 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 radionuclides in airborne particulates. The predominant wind direction with windspeeds high enough to suspend soil particulates in air [exceeding an estimated emission threshold of 7 m/s (Whicker et al., 2002; Webb et al., 2016)] is from the west or southwest; accordingly, HMC-1, HMC-1A, HMC-2 and HMC-3 are generally located downwind from potential sources of particulate emissions). The location identified as HMC-6 represents upwind 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, and maximally exposed, residences. HMC-7 is a blank Whatman filter that is analyzed as a lab and filter manufacturer quality check sample.

Homestake uses Hi-Q HVP-4300 AFC 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. Pace Analytical (PACE) analyzes the collected samples quarterly for Natural Uranium, Radium-226 and Thorium-230. Air sampling flow volumes and run times are recorded by HMC and the data are reported to PACE for calculation of average radionuclide concentrations in air particulates.

The results of environmental air particulate monitoring for 1st half 2022 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 eleven locations identified in Figure 1. The background location for radon gas is HMC-16, located northwest of the site. Due to characteristic nocturnal drainage airflow patterns with low windspeeds prevailing from the northeasterly direction, along with residual radiological impacts to surface soils on HMC property adjacent to monitoring station locations HMC-4 and HMC-5, these “point of compliance” monitoring stations typically have the highest effluent radon levels along HMC Site boundaries. With respect to radon gas, these stations are considered “downwind” from sources of effluent radon emissions at the Site. Rapidos high-sensitivity track-etch passive radon monitors (PRM) from Radonova, 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 semiannual 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 the 1st half 2022. 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, clarifier tanks, and spray evaporators on the evaporation ponds) are insignificant relative to those of the LTP and STP.

Annual flux measurements for calendar year 2022 were conducted as two separate deployments in May and June, consisting of 100 canisters per deployment on the STP and LTP respectively. Deployments were conducted in accordance with the methods proposed in HMC's response to the NRC's 2017 notice of violation (NOV) regarding an average radon flux rate from the LTP that exceeded the 20 picocuries per square meter per second ($\text{pCi m}^{-2} \text{s}^{-1}$) standard given in 10 CFR 40, Appendix A (ERG, 2017 and NRC, 2017). The Radon Flux report for 2022 is provided in Attachment 4 to this Report.

On April 20, 2017, the NRC issued an NOV for the manner in which average radon flux was measured and calculated for 2015. The 2016 annual flux report, dated January 2017, utilized 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 36E with respect to the LTP. Although the 2017 radon flux NOV was recently withdrawn by NRC staff (ML21124A358), this protocol, utilized since 2017, continues to be followed as detailed in radon flux reports provided with corresponding semiannual environmental monitoring reports.

As indicated in the staff's May 5, 2021 withdrawal of the 2017 radon flux NOV (ML21124A358), HMC and NRC staff are continuing to work on resolution of the proper method for determination of the average radon flux from the LTP based on annual flux measurements on top of the LTP in accordance with License Condition 36E (see correspondences in ML21217A166, ML21257A126, and HMC, 2021). Until this issue is resolved, HMC will continue with the survey and reporting practices utilized since 2017.

With respect to the STP, this is an operational facility as Evaporation Pond 1 (EP1) operations and disposal of additional materials in the STP will continue. This interpretation is currently in conflict with NRC staff's October 20, 2021 interpretation that the STP is not an operational tailings impoundment (ML21257A126). HMC continues to contend that the STP is still operational (HMC, 2021), and with this understanding of applicable regulations, the STP is

broken into regions in accordance with EPA Method 115, with the pond being one region of zero flux (19.2 acres), and the remaining areas (earthen surfaces) along with the inside berms of EP-1, collectively representing a second region (34.0 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 is 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.

$$J_s = \frac{J_1 A_1 + J_2 A_2 + \dots + J_i A_i}{A_t}$$

where:

J_s	=	Mean flux for the total pile (pCi/m ² -s)
J_i	=	Mean flux measured in region i (pCi/m ² -s)
A_i	=	Area of region i (m ²)
A_t	=	Total area of the pile (m ²)

Based on 2022 flux monitoring results, the calculated average radon flux effluent value for the LTP in 2022 was 56.0 pCi m⁻² s⁻¹. In accordance with NRC staff's 2004 approval of Amendment 36 which added License Condition 36E (ML040400140), along with HMC's interpretation of 10 CFR 40, Appendix A, Criteria 6(2), 6(3), and 6A(2), the weighted average radon flux across the entire LTP (including the side slopes) in 2022 was 21.7 pCi m⁻² s⁻¹. With respect to the STP, the arithmetic mean flux for the earthen region of the pile (137,455 m² area) in 2022 was 29.3 pCi m⁻² s⁻¹. The area of EP1 is approximately 77,623 m², and this pond area was assigned a value of zero flux. The overall area-weighted average radon flux for the STP in 2022 was calculated as follows:

$$\text{STP Radon Flux} = [(29.3 \text{ pCi/m}^2\text{-s})(137,455 \text{ m}^2) + (0 \text{ pCi/m}^2\text{-s})(77,623 \text{ m}^2)] / (77,623 \text{ m}^2 + 137,455 \text{ m}^2) = 18.7 \text{ pCi/m}^2\text{-s}$$

Thus, average Rn-222 flux values of 56.0 and 18.7 pCi m⁻² s⁻¹ for the LTP and STP respectively are assumed for 2022. Based on the 2022 average flux values (56.0 and 18.7 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 annual radon emissions from the tailings piles in 2022 were calculated to be 758 Ci and 131 Ci respectively. For the 1st half 2022 semiannual reporting period only, effluent radon releases are assumed equivalent to half of these values, or 379 Ci and 65.5 Ci for the LTP and STP respectively. If the weighted average radon flux across the entire LTP is considered in accordance with LC 36E and 10 CFR 40, Appendix A, Criteria 6(2), 6(3), and 6A(2) (21.7 pCi m⁻² s⁻¹, inclusive of the side slopes), the calculated average annual effluent radon release from the LTP in 2022 is 294 Ci.

Detailed results of the 2022 radon flux measurements are provided in Attachment 4 to this 1st half Semiannual Report.

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 1st half 2022. 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 or Evaporation Pond 3 are presented in this table as well. The influent into the collection ponds was from 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 freeboard measurements missing from the first two weeks in January in EP3B and the 4th week in January in EP3A are a result of a malfunctioning meter. Freeboard was not exceeded during this time since the water level overtops the berm between the Collection Ponds A cell and B cell at 2.4 feet of freeboard, and A cell remained below that level throughout the first half of the year. The leak detection volumes pumped 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. No sumps exceeded the 775 gpd/ac criteria in the first half of 2022.

The tailings sump volume for the LTP are presented in Table 3.1-6. Injection into the LTP ceased in July 2015 and dewatering well collection ceased after 2017. 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 low concentration re-injection ceased operation in July of 2016 and therefore not presented in this monitoring report.

Table 3.1-9 presents the influent totals for the active treatment systems. The inflow to the RO plant averaged 587 gpm in the 1st half 2022 while the inputs to the 300 zeolite and 1200 zeolite cells were 0 and 176 gpm respectively. Table 3.1-10 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 reversal pair wells B-BA, DZ-KZ, SM-SN and S2-S5 are presented in this table.

3.3 Pond and Pipeline Maintenance

A tear in the secondary liner of Evaporation Pond 2 above the water line was repaired in May, 2022. No other repairs were done to the ponds or pipelines in the first half of 2022.

3.4 Well Drilling and Closures

No new wells were drilled during the period from January through June of 2022, as indicated in Table 3.4-1, while numerous wells were abandoned in the On-Site and Off-Site areas.

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 2022. Minor surface water erosion rilling was identified originating on top of the LTP after several rain events. The erosional rilling will be addressed in second half of 2022 to prevent further erosion in this area. Minor surface water erosion rilling was also identified on the STP and will be repaired at the same time as the LTP rilling.

No other significant maintenance activities were performed during this semiannual reporting period on the groundwater treatment systems:

Zeolite Groundwater Treatment

- No significant maintenance activities were performed on the zeolite system in the 1st half of 2022.

Reverse Osmosis Groundwater Treatment

- No significant maintenance activities were performed on the RO system in the 1st half of 2022.

4.0 WATER QUALITY MONITORING

4.1 Groundwater Quality Monitoring

Table 2-2 outlines the water quality sampling frequency and parameters monitored which was approved in November 2019 (ML19217A353) and amended in February 2022 (ML21356B139). 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. A sample was not collected from POC wells D1 and S4 in the 1st half of 2022 (see Table 4.1-4). The water quality of POC wells is currently not representative of steady state aquifer conditions and the concentration levels are 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 and TDS concentrations naturally exceed the site standard in well DD. The uranium concentrations in well DD2 naturally exceed the alluvial site standard as they have since this well was drilled. Total concentrations for manganese, selenium, molybdenum and uranium are presented for the ponds and are generally 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 RO product, zeolite treated and fresh water. This table also shows that all SP2 concentrations in the 1st half 2022 were less than all alluvial site standards for each of these samples except the slightly higher Th230 value of 0.5 pCi/L for SP2 on February 24th. This higher value is likely due to a laboratory error because no values for the other key parameters were elevated, nor are elevated thorium 230 concentrations observed in the wells used for collection.

Table 4.3-2 presents the treated water quality data for the RO product (ROSP1) and the zeolite treated water (300Z, 1200Z Trains 1 & 2, and 1200Z Trains 3 & 4). All RO product constituent concentrations measured in the 1st half 2022 were less than or equal to the corresponding alluvial site standards. Table 4.3-2 also presents the treated water quality for the zeolite treatment process. In the 1st half 2022, zeolite treatment water was less than or equal to the corresponding alluvial site standards treat for 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.

5.0 DIRECT RADIATION

Gamma dose rates are continuously monitored using optically stimulated luminescence (OSL) dosimeter badges placed at each of the eight locations identified in Figure 1. HMC #16 is currently 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 outdoors. The OSLs are exchanged semiannually 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 3.

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 Radiation Safety Officer (RSO) depending on the nature of the work being performed as specified in the Radiation Protection Program (RPP) Manual (HMC, 2022). The applicable procedure is found in SOP 12 (Contamination Surveys) which may or may not be conducted under a radiation work permit (RWP) at the discretion of the RSO. Documentation for personnel contamination surveys is maintained in RWP or miscellaneous surveys folders as applicable. For the 1st half of 2022, no personnel contamination surveys showed evidence of elevated activity in excess of the upper range of background levels.

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, 2022). Depending on the equipment use and potential for contact with tailings or other licensed radioactive material (e.g. residual solids from water treatment operations), the RSO may require equipment release surveys for projects that don't require an RWP. Standard Operating Procedures are used for all equipment release surveys. No surface contamination above the release criteria specified in NRC Regulatory Guide 8.30 was observed during this reporting period.

7.0 LOWER LIMIT OF DETECTION

Homestake representatives have calculated the Lower Limit of Detection (LLD) for field survey instrumentation systems, where applicable, to better inform evaluation of survey results. The lower limit of detection is defined in NRC 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 present at a given level of confidence. 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 [$\mu\text{Ci/mL}$]);
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, minimum detectable concentration (MDC), or reporting limit (RL) as applicable 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, MDC or RL as applicable for air and water samples will meet the specifications 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. Radonova (track-etch detector vendor lab) reports the LLD for radon-222. The LLDs for the constituents are:

Ra-226, Th-230 in air	1 E-16 $\mu\text{Ci/mL}$
Rn-222 in air	3.4 E-10 $\mu\text{Ci/mL}$
U-nat in air	1 E-16 $\mu\text{Ci/mL}$
U-nat in water	2 E-10 $\mu\text{Ci/mL}$
Ra-226, Th-230 in water	2 E-10 $\mu\text{Ci/mL}$

8.0 DATA SUMMARY AND CONCLUSIONS

The summaries of Homestake's environmental effluent monitoring program included in this submittal contain data for applicable radiological parameters that could be 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 for the required monitoring period.

The data collected for Homestake's environmental effluent monitoring program parameters can be readily compared to 10 CFR Part 20 Appendix B effluent concentration (EC) values, not for determinations of public dose, but as a qualitative 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 current reporting period (1st half 2022), Homestake has not exceeded 10 CFR Part 20 EC values in any terrestrial effluents covered by this report. As discussed earlier, this does not include groundwater values at POC wells.

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].

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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	HMC1, HMC1A, HMC2, and HMC3 at or near the site boundary (sectors with highest predicted levels of airborne radioactive particulates).	Continuous (High Vol.)	Weekly filter change, or as needed. Samples composited and analyzed quarterly.	U-nat, Ra-226, Th-230
Air Particulates	2	HMC4 and HMC5 (points of compliance for maximally exposed member of public)	Continuous (High Vol.)	Weekly filter change, or as needed. Samples composited and analyzed quarterly.	U-nat, Ra-226, Th-230
Air Particulates	1	HMC6 as a background location	Continuous (High Vol.)	Weekly filter change, or as needed. Samples composited and analyzed quarterly.	U-nat, Ra-226, Th-230
Radon Gas	24	2 each at the locations described above, plus HMC1OFF, HMC6OFF, HMC7, and HMC16 as a background location. Indoor locations in office and RO plant (1 each).	Continuous Track-etch	Quarterly	Rn-222
Direct Radiation	10 + 2 transit control badges	Locations described in Air - Particulates plus HMC1OFF, HMC6OFF, and HMC16 as a background location	Continuous OSL	Semiannually	Gamma Dose Rate

Table 2-2
Groundwater Monitoring Program (2019, as modified by
Amendment 54)

Table 2-2. Groundwater Monitoring at the Grants Site (2019 as modified by Amendment 54)

Well	Parameter List Code	Frequency of Monitoring
<i>Alluvial Background Wells</i>		
P, Q, 921	B, F	Annual
<i>Operational Monitoring</i>		
Collection system wells	Total Volume	Monthly
Injection system wells	Total Volume	Monthly
Reversal wells KZ, DZ, SM, SN, S2, S5	B, BA, Water Level	Weekly
<i>San Andres Wells</i>		
Deep #1R, Deep #2R, 943M, 951R	B, F H	Annual Semiannual
<i>Alluvial Compliance Monitoring Wells</i>		
On-Site Monitoring Wells (Evap. Ponds) DD, DD2, X	B, F plus Mn H	Annual Quarterly
Additional On-Site Monitoring Wells 1A, 1K, 639, 802, B11, D1, F, FB, GH, GN, L, L5, K9, M3, MX, MB, MQ, NC, S4, SUB3, T2, T19, T23, T41, T54	B, F	Annual
South Off-Site Wells 490, 497, 540, 631, 643#, 644, 864, 869, Q5, R3, SUB2	B, F	Annual
Section 34 Land application wells 555, 556, 557, 844, 845, 846	B, F	Annual
North Off-Site Wells(includes Section 28 Land application wells) 688, 881, 882, 883, 884, 886, 888, 893, 659, H2A, MR, H55, MO	B, F	Annual
Western Portion of North Off-Site Wells (Includes Section 33 Land application wells) 541, 551, 647, 649, 654, 899, 996	B, F	Annual
<i>Chinle Compliance Monitoring Wells</i>		
Upper Chinle Wells 494, CE2, CE7, CE8, CE9, CE15, CW3, CW13#, CW18, CW25#	B, F	Annual
Middle Chinle Wells 493, ACW, CW17, CW2, CW28, CW45, CW55, CW62, CW76, R3, Y7	B, F	Annual
Lower Chinle Wells CW29, CW32, CW41, CW42, CW43, V6	B, F	Annual

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

Table 2-2. Groundwater Monitoring at the Grants Site (2019 as modified by Amendment 54), con't

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

Table 2-3
Occupational Monitoring Program

Table 2-3 Occupational Exposure/Dose Monitoring Program

Type of Sample	Number	Locations	Procedure	Frequency	Analytical Parameters
Lapel Personal Air Sample	As required by RWP or at RSO discretion	As required by RWP (2-3 L/min or equivalent)	SOP 11 (HP-1)	As required by RWP or at RSO discretion	Alpha, U-nat
Lapel Air Sampler Calibration	All units in current use	N/A	Manufacturer Specifications	As required by RWP	Flow rate
Release of Equipment	As required by RWP	Potentially Contaminated Equipment and Materials	SOP 12 (HP-4)	As required by RWP	Alpha, beta gamma
ALARA	N/A	As required by RSO	Section 4.2 RPP Manual ^A	N/A	As required by RSO
Respiratory Protection ^B	As required by RWP	As required by RWP	N/A ^B	N/A	N/A
Bioassay	Entry/exit and routine semiannual samples, and as required by RWP	Routine Site workers and as required by RSO for RWP workers	SOP 14 (HP-8)	Entry/exit and routine semiannual samples, and as required by RWP	U-nat in urine
Instrument Calibration	Variable	Radiation Detection Instruments in use	SOP 16 (HP-10)	6 months or less	N/A
Dosimetry	Variable	Personnel onsite > 5 days per year	SOP 13 (HP-3)	Quarterly	Gamma
Personnel Contamination	As required by RWP	As required by RWP	SOP 12 (HP-12)	As required by RWP	Alpha
Radiation Protection Training	As required	HMC GRP site	Taught by RSO or RST designee. ^C	Initial & annual refresher for personnel that work in Controlled Areas.	Training class & written test

^A In 2022 HP-6 was replaced with Section 4.2 of the Radiation Protection Program (RPP) Manual.

^B Respiratory protection not expected to be necessary for current site decommissioning and reclamation activities. Procedure HP-7 has been inactivated and is not included in current RPP Manual or in the HMC Manual of Standard Practices.

^C Annual refresher training is given by the RSO for all regular HMC employees that work in Controlled Areas. Temporary contractors are generally trained by the Radiation Safety Technician (RST) as a designee of the RSO, with the aid of a previously developed radiation safety video followed by testing.

Tables 3.1-1 through 3.1-10
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	5,435,000

May	Interval Gallons
Transfer EP-2 to EP-1	9,002,000

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

Evap Pond 2

January	Interval Gallons
R.O. Flow to Evaporation Ponds	4,870,081
Tailings Sumps	131,530
Tailings Pile	0
Zeolite Regeneration & Overflow	570,100
W Coll Pond to EP-2	2,596,169

February	Interval Gallons
R.O. Flow to Evaporation Ponds	4,696,060
Tailings Sumps	47,040
Tailings Pile	0
Zeolite Regeneration & Overflow	1,324,500
W Coll Pond to EP-2	0

March	Interval Gallons
R.O. Flow to Evaporation Ponds	6,218,190
Tailings Sumps	29,030
Tailings Pile	0
Zeolite Regeneration & Overflow	1,121,500
W Coll Pond to EP-2	141

April	Interval Gallons
R.O. Flow to Evaporation Ponds	5,797,010
Tailings Sumps	115,500
Tailings Pile	0
Zeolite Regeneration & Overflow	4,745,000
W Coll Pond to EP-2	2,538,321

May	Interval Gallons
R.O. Flow to Evaporation Ponds	5,496,030
Tailings Sumps	77,370
Tailings Pile	0
Zeolite Regeneration & Overflow	2,678,200
W Coll Pond to EP-2	0

June	Interval Gallons
R.O. Flow to Evaporation Ponds	3,173,450
Tailings Sumps	160,910
Tailings Pile	0
Zeolite Regeneration & Overflow	1,767,400
W Coll Pond to EP-2	0

Evap Pond 3

January	Interval Gallons
Transfer EP-1 to EP-3	0
Transfer EP-2 to EP-3	0

February	Interval Gallons
Transfer EP-1 to EP-3	0
Transfer EP-2 to EP-3	0

March	Interval Gallons
Transfer EP-1 to EP-3	0
Transfer EP-2 to EP-3	0

April	Interval Gallons
Transfer EP-1 to EP-3	0
Transfer EP-2 to EP-3	12,657,883

May	Interval Gallons
Transfer EP-1 to EP-3	0
Transfer EP-2 to EP-3	0

June	Interval Gallons
Transfer EP-1 to EP-3	0
Transfer EP-2 to EP-3	0

Collection Ponds

January	Interval Gallons
Miscellaneous RO and Clarifier Flow	7,979,872
Tailings Sumps	0
Zeolite Regeneration	0

February	Interval Gallons
Miscellaneous RO and Clarifier Flow	6,797,400
Tailings Sumps	0
Zeolite Regeneration	0

March	Interval Gallons
Miscellaneous RO and Clarifier Flow	3,729,224
Tailings Sumps	0
Zeolite Regeneration	0

April	Interval Gallons
Miscellaneous RO and Clarifier Flow	2,430,342
Tailings Sumps	0
Zeolite Regeneration	0

May	Interval Gallons
Miscellaneous RO and Clarifier Flow	3,094,190
Tailings Sumps	0
Zeolite Regeneration	0

June	Interval Gallons
Miscellaneous RO and Clarifier Flow	2,866,054
Tailings Sumps	0
Zeolite Regeneration	0

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

	EP1	EP2	EP3A	EP3B	W Coll	E Coll
1/3/2022	13.96	9.4	3.70	-	3.9	-
1/10/2022	13.96	9.17	3.72	-	3	-
1/17/2022	13.96	8.9	3.75	3.43	2.77	-
1/24/2022	13.96	8.71	-	3.42	2.22	-
1/31/2022	13.96	7.85	3.81	3.45	5.75	-
2/7/2022	13.96	7.36	3.82	3.45	5.12	-
2/14/2022	13.96	6.85	3.87	3.34	4.39	-
2/21/2022	13.96	6.47	3.90	3.34	3.96	-
2/28/2022	13.96	6.42	3.98	3.28	3.66	-
3/7/2022	13.96	6	4.06	3.69	3.22	-
3/14/2022	13.96	5.85	4.10	3.91	2.82	-
3/21/2022	13.96	5.49	4.19	4.08	2.55	-
3/28/2022	13.96	5.49	4.29	4.18	2.33	-
4/4/2022	13.96	4.77	4.38	4.2	3.83	-
4/11/2022	13.96	6.55	2.99	3.08	3.66	-
4/18/2022	13.96	6.54	3.38	2.54	3.32	-
4/25/2022	13.96	7.17	3.65	2.61	3.96	-
5/2/2022	13.96	8.68	3.82	2.79	3.91	-
5/9/2022	13.96	8.55	4.03	2.93	4.11	-
5/16/2022	13.96	8.34	4.18	3.03	4.4	-
5/23/2022	12.58	8.18	4.38	3.12	4.37	-
5/30/2022	12.58	7.96	4.57	3.26	4.67	-
6/6/2022	12.58	7.77	4.74	3.42	4.78	-
6/13/2022	12.58	7.79	4.93	3.66	4.89	-
6/20/2022	12.58	7.7	4.95	3.87	4.97	-
6/27/2022	12.58	7.5	4.81	3.8	4.77	-

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	174,220			2,135,930			957,690			1,191,250			1,431,580		
1/3/2022	174,220	0	0	2,136,640	710	32	957,690	0	0	1,191,250	0	0	1,431,590	10	0
1/10/2022	174,220	0	0	2,136,710	70	3	957,690	0	0	1,191,250	0	0	1,431,590	0	0
1/17/2022	174,220	0	0	2,136,710	0	0	957,690	0	0	1,191,250	0	0	1,435,750	4,160	168
1/24/2022	174,220	0	0	2,136,720	10	0	957,690	0	0	1,191,250	0	0	1,444,510	8,760	355
1/31/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,452,690	8,180	331
2/7/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,461,080	8,390	340
2/14/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,469,040	7,960	322
2/21/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,476,950	7,910	320
2/28/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,483,760	6,810	276
3/7/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,491,360	7,600	308
3/14/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,499,920	8,560	346
3/21/2022	174,220	0	0	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,509,780	9,860	399
3/28/2022	174,250	30	1	2,136,720	0	0	957,690	0	0	1,191,250	0	0	1,520,800	11,020	446
4/4/2022	174,220	-30	-1	2,136,780	60	3	958,020	330	12	1,191,250	0	0	1,531,870	11,070	448
4/11/2022	174,220	0	0	2,136,780	0	0	960,810	2,790	104	1,191,250	0	0	1,547,330	15,460	626
4/18/2022	174,220	0	0	2,136,540	-240	-11	960,810	0	0	1,191,250	0	0	1,556,560	9,230	374
4/25/2022	174,220	0	0	2,136,130	-410	-19	960,820	10	0	1,191,250	0	0	1,565,650	9,090	368
5/2/2022	174,220	0	0	2,135,940	-190	-9	960,820	0	0	1,191,250	0	0	1,574,630	8,980	363
5/9/2022	174,220	0	0	2,135,580	-360	-16	960,820	0	0	1,191,250	0	0	1,581,030	6,400	259
5/16/2022	174,220	0	0	2,136,400	820	37	960,820	0	0	1,191,250	0	0	1,582,560	1,530	62
5/23/2022	174,220	0	0	2,136,720	320	15	960,820	0	0	1,191,250	0	0	1,583,520	960	39
5/30/2022	174,220	0	0	2,136,720	0	0	960,820	0	0	1,191,250	0	0	1,583,520	0	0
6/6/2022	174,220	0	0	2,148,060	11,340	514	960,820	0	0	1,191,250	0	0	1,599,300	15,780	639
6/13/2022	174,220	0	0	2,152,130	4,070	185	960,820	0	0	1,191,250	0	0	1,599,300	0	0
6/20/2022	174,220	0	0	2,155,630	3,500	159	960,820	0	0	1,191,250	0	0	1,599,330	30	1
6/27/2022	174,220	0	0	2,159,930	4,300	195	960,220	-600	-22	1,191,250	0	0	1,599,360	30	1

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 exceed 775 are in bold.

= Pump not installed due to collapsed standpipe

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			1,189,930			303,160			29,990			690,460		
1/3/2022	70	0	0	1,190,110	180	10	303,160	0	0	29,990	0	0	690,460	0	0
1/10/2022	70	0	0	1,191,450	1,340	74	303,160	0	0	29,990	0	0	690,470	10	1
1/17/2022	70	0	0	1,190,580	-870	-48	303,160	0	0	29,990	0	0	690,480	10	1
1/24/2022	70	0	0	1,190,800	220	12	303,160	0	0	29,990	0	0	690,490	10	1
1/31/2022	70	0	0	1,190,930	130	7	303,160	0	0	29,990	0	0	690,490	0	0
2/7/2022	70	0	0	1,191,750	820	45	303,160	0	0	29,990	0	0	690,500	10	1
2/14/2022	70	0	0	1,191,770	20	1	303,160	0	0	29,990	0	0	690,510	10	1
2/21/2022	70	0	0	1,193,020	1,250	69	303,160	0	0	29,990	0	0	690,520	10	1
2/28/2022	70	0	0	1,193,030	10	1	303,160	0	0	29,990	0	0	690,520	0	0
3/7/2022	70	0	0	1,193,050	20	1	303,160	0	0	29,990	0	0	690,540	20	1
3/14/2022	70	0	0	1,193,070	20	1	303,160	0	0	29,990	0	0	690,550	10	1
3/21/2022	70	0	0	1,193,090	20	1	303,160	0	0	29,990	0	0	690,560	10	1
3/28/2022	70	0	0	1,193,940	850	47	303,160	0	0	29,990	0	0	690,580	20	1
4/4/2022	70	0	0	1,193,950	10	1	303,160	0	0	29,990	0	0	690,590	10	1
4/11/2022	70	0	0	1,203,920	9,970	552	303,160	0	0	29,990	0	0	701,690	11,100	615
4/18/2022	70	0	0	1,208,230	4,310	239	303,160	0	0	29,990	0	0	704,610	2,920	162
4/25/2022	70	0	0	1,208,230	0	0	303,160	0	0	29,990	0	0	704,610	0	0
5/2/2022	70	0	0	1,211,130	2,900	161	303,160	0	0	29,990	0	0	704,620	10	1
5/9/2022	70	0	0	1,211,700	570	32	303,160	0	0	29,990	0	0	704,630	10	1
5/16/2022	70	0	0	1,211,840	140	8	303,160	0	0	29,990	0	0	704,640	10	1
5/23/2022	70	0	0	1,212,710	870	48	303,160	0	0	29,990	0	0	704,650	10	1
5/30/2022	70	0	0	1,212,720	10	1	303,160	0	0	29,990	0	0	704,660	10	1
6/6/2022	70	0	0	1,212,740	20	1	303,160	0	0	29,990	0	0	704,670	10	1
6/13/2022	70	0	0	1,212,760	20	1	303,160	0	0	29,990	0	0	704,680	10	1
6/20/2022	70	0	0	1,212,790	30	2	303,160	0	0	29,990	0	0	704,690	10	1
6/27/2022	70	0	0	1,212,810	20	1	303,160	0	0	29,990	0	0	704,700	10	1

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 exceed 775 are in **bold**.

@ = Totalizer not connected

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	252,280			566,530			1,869,200			534,900			446,830		
1/3/2022	252,280	0	0	566,530	0	0	1,869,260	60	3	534,900	0	0	446,830	0	0
1/10/2022	252,280	0	0	566,530	0	0	1,869,830	570	32	534,900	0	0	446,830	0	0
1/17/2022	252,280	0	0	570,550	4,020	223	1,870,630	800	44	534,900	0	0	446,830	0	0
1/24/2022	252,280	0	0	577,660	7,110	394	1,870,890	260	14	534,900	0	0	446,830	0	0
1/31/2022	252,280	0	0	579,850	2,190	121	1,877,760	6,870	380	534,900	0	0	446,830	0	0
2/7/2022	252,280	0	0	579,860	10	1	1,882,970	5,210	288	534,900	0	0	446,830	0	0
2/14/2022	252,280	0	0	579,860	0	0	1,887,530	4,560	252	534,900	0	0	446,830	0	0
2/21/2022	252,280	0	0	579,860	0	0	1,897,170	9,640	534	534,900	0	0	446,830	0	0
2/28/2022	252,280	0	0	579,850	-10	-1	1,890,830	-6,340	-351	534,900	0	0	446,830	0	0
3/7/2022	252,280	0	0	579,850	0	0	1,893,500	2,670	148	534,900	0	0	446,830	0	0
3/14/2022	252,280	0	0	579,850	0	0	1,896,820	3,320	184	534,900	0	0	446,830	0	0
3/21/2022	252,280	0	0	579,850	0	0	1,897,540	720	40	534,900	0	0	446,830	0	0
3/28/2022	252,280	0	0	579,850	0	0	1,900,520	2,980	165	534,900	0	0	446,830	0	0
4/4/2022	252,280	0	0	579,850	0	0	1,902,710	2,190	121	534,900	0	0	446,830	0	0
4/11/2022	252,280	0	0	579,850	0	0	1,903,690	980	54	534,900	0	0	446,830	0	0
4/18/2022	252,280	0	0	589,850	10,000	554	1,909,680	5,990	332	534,900	0	0	446,830	0	0
4/25/2022	252,280	0	0	579,850	-10,000	-554	1,912,650	2,970	164	534,900	0	0	446,830	0	0
5/2/2022	252,280	0	0	579,850	0	0	1,915,420	2,770	153	534,900	0	0	446,830	0	0
5/9/2022	252,280	0	0	579,850	0	3	1,918,650	3,230	179	534,900	0	0	446,830	0	0
5/16/2022	252,280	0	0	579,900	50	-2	1,915,420	-3,230	-179	534,900	0	0	446,830	0	0
5/23/2022	252,280	0	0	579,870	-30	1	1,921,980	6,560	363	534,900	0	0	449,130	2,300	127
5/30/2022	252,280	0	0	579,890	20	0	1,927,550	5,570	308	534,900	0	0	449,320	190	11
6/6/2022	252,280	0	0	579,890	0	2	1,931,380	3,830	212	534,900	0	0	450,280	960	53
6/13/2022	252,280	0	0	579,920	30	1	1,935,550	4,170	231	534,900	0	0	450,360	80	4
6/20/2022	252,280	0	0	579,930	10	1	1,935,720	170	9	534,900	0	0	451,820	1,460	81
6/27/2022	252,280	0	0	579,940	10	1	1,940,050	4,330	240	534,900	0	0	453,890	2,070	115

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 exceed 775 are in **bold**.

= Pump Maintenance; pumps off line.

Table 3.1-6. Monthly Tailings Collection and Injection Totals

	Sumps (gallons)
January	131,530
February	47,040
March	29,030
April	115,500
May	77,370
June	160,910

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	21,695,602	7,628,370	1,583,100	3,994,230	0	1,577,170	0	2,753,200
February	13,316,251	8,487,749	963,200	6,200,000	0	1,599,920	0	2,810,010
March	16,917,890	6,716,646	1,209,800	4,127,705	0	1,514,045	0	1,968,700
April	13,329,102	9,742,730	1,171,400	5,955,790	0	1,799,110	0	2,028,600
May	15,288,656	5,954,090	1,065,400	4,328,990	0	4,059,540	0	1,488,000
June	8,459,585	4,024,015	0	2,085,655	0	1,105,635	0	467,000

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	26,945,984	1,581,050	283,385	6,146,650	0	861,450	0	9,512,300
February	20,973,662	1,274,670	234,730	4,457,850	0	659,550	0	6,486,800
March	25,005,654	1,141,210	209,030	5,228,880	0	611,450	0	6,755,700
April	23,673,155	1,192,750	225,830	3,641,400	0	717,000	0	6,543,900
May	26,246,706	1,464,760	230,870	3,985,100	0	427,700	0	7,010,300
June	17,459,131	1,532,130	19,430	3,027,210	0	150,890	0	4,971,700

Table 3.1-9. Treatment System Influent Monthly Totals (gallons)

	300 GPM Zeolite	1200 GPM Zeolite	RO Plant
January	0	8,324,600	34,126,800
February	0	8,930,700	24,865,760
March	0	6,376,100	28,339,814
April	0	8,892,100	25,961,052
May	0	9,378,400	25,200,420
June	0	4,207,800	15,247,704

Table 3.1-10. Treatment System Effluent and Fresh Water Monthly Totals (gallons)

	Treatment Systems				Fresh Water Injection		
	Zeolite		RO Plant		On-Site	South Off-Site	North Off-Site
	Treated	Regeneration	Treated	Brine			
January	7,754,500	570,100	21,276,847	4,870,081	10,523,823	2,450,082	3,325,568
February	7,606,200	1,324,500	13,372,300	4,696,060	8,703,497	1,942,702	2,462,563
March	5,254,600	1,121,500	18,392,400	6,218,190	9,379,875	1,642,660	2,642,157
April	4,147,100	4,745,000	17,733,700	5,797,010	9,453,922	1,862,648	2,796,665
May	6,700,200	2,678,200	16,610,200	5,496,030	10,698,739	2,069,164	3,287,133
June	2,440,400	1,767,400	9,208,200	3,173,450	8,595,116	2,697,269	4,219,506

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
1/3/2022	43.52	46.16	59.90	37.77	41.78	47.56	44.66	44.00	45.44	45.47
1/10/2022	43.48	46.01	60.56	37.70	41.76	47.70	44.84	45.33	45.69	45.69
1/17/2022	48.49	46.00	60.48	37.78	41.72	47.88	44.86	45.34	45.62	45.72
1/24/2022	43.46	46.05	60.56	37.77	41.66	47.94	44.83	45.37	45.58	45.71
1/31/2022	43.55	46.14	60.69	37.85	49.58	48.13	44.88	45.42	45.65	45.74
2/7/2022	43.63	46.30	60.92	37.80	41.72	48.00	44.92	45.77	45.67	45.75
2/14/2022	44.00	46.70	61.30	38.23	41.55	48.05	44.80	45.36	45.53	45.68
2/21/2022	43.65	45.50	60.85	37.86	41.52	48.05	43.90	44.80	45.52	45.30
2/28/2022	43.50	44.95	60.00	36.00	41.78	48.02	44.85	45.45	45.68	45.75
3/7/2022	43.70	45.26	Dry	37.98	41.60	47.95	44.86	45.42	45.65	45.72
3/14/2022	43.84	45.32	Dry	38.08	41.73	48.64	44.91	45.55	45.76	45.81
3/21/2022	43.80	45.29	Dry	38.00	41.64	47.95	44.85	45.42	45.60	45.73
3/28/2022	43.85	46.44	60.84	38.00	41.64	48.01	44.91	45.49	45.76	45.77
4/4/2022	43.82	46.70	Dry	38.40	41.35	47.31	45.30	45.50	45.90	46.15
4/11/2022	43.90	46.80	Dry	38.30	41.75	48.13	45.70	44.80	45.45	45.63
4/18/2022	43.85	46.65	Dry	37.90	46.29	48.25	45.25	45.75	46.00	46.23
4/25/2022	44.05	46.87	61.31	38.00	41.61	48.43	45.20	45.22	45.47	45.85
5/2/2022	43.91	47.00	54.40	36.70	41.55	48.10	44.94	45.25	48.90	46.55
5/9/2022	44.04	46.64	Dry	38.17	41.63	47.41	44.91	45.63	45.72	45.70
5/16/2022	43.82	46.46	Dry	38.00	41.22	51.05	44.80	45.80	45.76	46.10
5/26/2022	44.30	56.62	60.00	49.70	41.40	47.92	45.13	45.23	45.08	45.03
6/6/2022	43.34	44.73	60.55	38.17	41.87	47.83	44.82	45.37	45.74	45.73
6/13/2022	43.32	44.66	60.04	38.24	41.83	47.84	44.83	45.77	45.78	45.72
6/20/2022	42.38	44.85	49.90	39.30	41.75	47.30	45.01	45.15	46.00	46.15
6/27/2022	43.31	44.33	59.58	33.43	41.89	48.20	45.26	45.71	45.97	45.87

Table 3.4-1
Wells Drilled

Table 3.4-1. Wells Drilled and Abandoned

[illegible]

Table 4.1-1
Water Quality Analysis for Well D1

No samples collected 1st half of 2022

Table 4.1-2
Water Quality Analysis for Well DD



Formerly Inter-Mountain Laboratories

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 2/16/2022
Report ID: S2202028001

ProjectName: HMC GRP
Lab ID: S2202028-006
ClientSample ID: DD
COC: WEB
PWS ID:

WorkOrder: S2202028
CollectionDate: 2/1/2022 9:11:00 AM
DateReceived: 2/2/2022 11:25:00 AM
FieldSampler: EA
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Field

pH 7.23 s.u. Field 02/01/2022 911

Anions/Cations

Chloride 67.9 mg/L D 2.24 EPA 300.0 02/03/2022 2159 AB
Sulfate 1780 mg/L D 5 EPA 300.0 02/04/2022 1845 AB

General Parameters

Total Dissolved Solids (180) 3470 mg/L 20 SM 2540 02/04/2022 1102 ACE

Metals - Dissolved

Molybdenum <0.01 mg/L 0.01 EPA 200.8 02/03/2022 108 MS
Selenium 0.056 mg/L 0.005 EPA 200.8 02/03/2022 108 MS
Uranium 0.112 mg/L 0.0003 EPA 200.8 02/03/2022 108 MS



Pace Analytical

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported: 7/19/2022
Report ID: S2205559001

ProjectName: GW (HP-15) B
Lab ID: S2205559-001
ClientSample ID: DD
COC: web
PWS ID:

WorkOrder: S2205559
CollectionDate: 5/25/2022 9:15:00 AM
DateReceived: 5/27/2022
FieldSampler: SF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO ₃)	297	mg/L		5	SM 2320B	05/29/2022 2344	KAT
Alkalinity, Bicarbonate as HCO ₃	362	mg/L		5	SM 2320B	05/29/2022 2344	KAT
Alkalinity, Carbonate as CO ₃	<5	mg/L		5	SM 2320B	05/29/2022 2344	KAT
Chloride	64.7	mg/L	D	2.24	EPA 300.0	06/02/2022 401	AB
Nitrogen, Nitrate+Nitrite (as N)	12.1	mg/L		0.1	EPA 353.2	06/21/2022 1526	AMB
Sulfate	1980	mg/L	D	5	EPA 300.0	06/03/2022 2346	AB
Calcium	475	mg/L		2	EPA 200.7	06/09/2022 1911	DG
Magnesium	107	mg/L		2	EPA 200.7	06/09/2022 1911	DG
Potassium	8	mg/L		2	EPA 200.7	06/09/2022 1911	DG
Sodium	402	mg/L		3	EPA 200.7	06/09/2022 1911	DG
General Parameters							
pH	8.1	s.u.		0.1	SM 4500 H B	05/29/2022 2344	KAT
Total Dissolved Solids (180)	3600	mg/L		20	SM 2540	05/30/2022 1136	AB
Metals - Dissolved							
Arsenic	<0.005	mg/L		0.005	EPA 200.8	06/01/2022 010	MS
Boron	0.4	mg/L		0.1	EPA 200.7	06/09/2022 1911	DG
Cadmium	<0.001	mg/L		0.001	EPA 200.8	06/01/2022 010	MS
Lithium	0.26	mg/L		0.01	EPA 200.7	06/09/2022 1911	DG
Manganese	0.19	mg/L		0.02	EPA 200.7	06/09/2022 1911	DG
Manganese	0.191	mg/L		0.005	EPA 200.8	06/01/2022 010	MS
Molybdenum	<0.01	mg/L		0.01	EPA 200.8	06/01/2022 010	MS
Selenium	0.084	mg/L		0.005	EPA 200.8	06/01/2022 010	MS
Strontium	5.87	mg/L		0.02	EPA 200.7	06/09/2022 1911	DG
Uranium	0.103	mg/L		0.0003	EPA 200.8	06/01/2022 010	MS
Vanadium	<0.02	mg/L		0.02	EPA 200.8	06/01/2022 010	MS
Radionuclides - Dissolved							
Gross Alpha	77.6	pCi/L		2	SM 7110B	07/11/2022 1518	AEF
Gross Alpha Precision (±)	9.9	pCi/L			SM 7110B	07/11/2022 1518	AEF
Gross Alpha(Excluding Radon and Uranium)	7.9	pCi/L		2	Calculation	07/12/2022 1251	JKG
Gross Alpha Precision (±)	9.9	pCi/L			Calculation	07/12/2022 1251	JKG
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	07/08/2022 1320	WN
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	07/08/2022 1320	WN
Radium 228	<1	pCi/L		1	Ga-Tech	07/07/2022 1507	WN
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	07/07/2022 1507	WN
Thorium 230	<0.3	pCi/L		0.3	ACW10	07/14/2022 1259	AEF
Thorium 230 Precision (±)	0.03	pCi/L			ACW10	07/14/2022 1259	AEF

Table 4.1-3
Water Quality Analyses for Well DD2



Formerly Inter-Mountain Laboratories

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 2/16/2022
Report ID: S2202028001

ProjectName: HMC GRP
Lab ID: S2202028-007
ClientSample ID: DD2
COC: WEB
PWS ID:

WorkOrder: S2202028
CollectionDate: 2/1/2022 9:32:00 AM
DateReceived: 2/2/2022 11:25:00 AM
FieldSampler: EA
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
pH	7.01	s.u.			Field	02/01/2022 932	
Anions/Cations							
Chloride	56.4	mg/L	D	2.24	EPA 300.0	02/03/2022 2213	AB
Sulfate	1440	mg/L		2	EPA 300.0	02/03/2022 2213	AB
General Parameters							
Total Dissolved Solids (180)	2640	mg/L		20	SM 2540	02/04/2022 1103	ACE
Metals - Dissolved							
Molybdenum	<0.01	mg/L		0.01	EPA 200.8	02/03/2022 114	MS
Selenium	<0.005	mg/L		0.005	EPA 200.8	02/03/2022 114	MS
Uranium	0.226	mg/L		0.0003	EPA 200.8	02/03/2022 114	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 7/19/2022
Report ID: S2205559001

ProjectName: GW (HP-15) B
Lab ID: S2205559-002
ClientSample ID: DD2
COC: web
PWS ID:

WorkOrder: S2205559
CollectionDate: 5/25/2022 10:07:00 AM
DateReceived: 5/27/2022
FieldSampler: SF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Anions/Cations							
Alkalinity, Total (As CaCO ₃)	309	mg/L		5	SM 2320B	05/29/2022 2353	KAT
Alkalinity, Bicarbonate as HCO ₃	377	mg/L		5	SM 2320B	05/29/2022 2353	KAT
Alkalinity, Carbonate as CO ₃	<5	mg/L		5	SM 2320B	05/29/2022 2353	KAT
Chloride	54.4	mg/L	D	2.24	EPA 300.0	06/02/2022 413	AB
Nitrogen, Nitrate+Nitrite (as N)	<0.1	mg/L		0.1	EPA 353.2	06/21/2022 1528	AMB
Sulfate	1440	mg/L		2	EPA 300.0	06/02/2022 413	AB
Calcium	368	mg/L		2	EPA 200.7	06/09/2022 1913	DG
Magnesium	88	mg/L		2	EPA 200.7	06/09/2022 1913	DG
Potassium	8	mg/L		2	EPA 200.7	06/09/2022 1913	DG
Sodium	352	mg/L		3	EPA 200.7	06/09/2022 1913	DG
General Parameters							
pH	8.0	s.u.		0.1	SM 4500 H B	05/29/2022 2353	KAT
Total Dissolved Solids (180)	2690	mg/L		20	SM 2540	05/30/2022 1137	AB
Metals - Dissolved							
Arsenic	<0.005	mg/L		0.005	EPA 200.8	06/01/2022 016	MS
Boron	0.3	mg/L		0.1	EPA 200.7	06/09/2022 1913	DG
Cadmium	<0.001	mg/L		0.001	EPA 200.8	06/01/2022 016	MS
Lithium	0.19	mg/L		0.01	EPA 200.7	06/09/2022 1913	DG
Manganese	2.69	mg/L		0.02	EPA 200.7	06/09/2022 1913	DG
Manganese	2.38	mg/L		0.005	EPA 200.8	06/01/2022 016	MS
Molybdenum	<0.01	mg/L		0.01	EPA 200.8	06/01/2022 016	MS
Selenium	<0.005	mg/L		0.005	EPA 200.8	06/01/2022 016	MS
Strontium	4.94	mg/L		0.02	EPA 200.7	06/09/2022 1913	DG
Uranium	0.212	mg/L		0.0003	EPA 200.8	06/01/2022 016	MS
Vanadium	<0.02	mg/L		0.02	EPA 200.8	06/01/2022 016	MS
Radionuclides - Dissolved							
Gross Alpha	156	pCi/L		2	SM 7110B	07/11/2022 1518	AEF
Gross Alpha Precision (±)	14.4	pCi/L			SM 7110B	07/11/2022 1518	AEF
Gross Alpha(Excluding Radon and Uranium)	12.5	pCi/L		2	Calculation	07/12/2022 1251	JKG
Gross Alpha Precision (±)	14.4	pCi/L			Calculation	07/12/2022 1251	JKG
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	07/08/2022 1320	WN
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	07/08/2022 1320	WN
Radium 228	1.9	pCi/L		1	Ga-Tech	07/07/2022 1810	WN
Radium 228 Precision (±)	2.6	pCi/L			Ga-Tech	07/07/2022 1810	WN
Thorium 230	<0.3	pCi/L		0.3	ACW10	07/14/2022 1703	AEF
Thorium 230 Precision (±)	0	pCi/L			ACW10	07/14/2022 1703	AEF

Table 4.1-4
Water Quality Analyses for Well P



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 7/19/2022
Report ID: S2206072001

ProjectName: HMC GRP
Lab ID: S2206072-001
ClientSample ID: P
COC:
PWS ID:

WorkOrder: S2206072
CollectionDate: 6/2/2022 10:26:00 AM
DateReceived: 6/3/2022 10:46:00 AM
FieldSampler: SF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Field						
pH	7.47	s.u.			Field	06/02/2022 1026
Anions/Cations						
Alkalinity, Total (As CaCO ₃)	219	mg/L		5	SM 2320B	06/10/2022 439 KAT
Alkalinity, Bicarbonate as HCO ₃	267	mg/L		5	SM 2320B	06/10/2022 439 KAT
Alkalinity, Carbonate as CO ₃	<5	mg/L		5	SM 2320B	06/10/2022 439 KAT
Chloride	47	mg/L		1	EPA 300.0	06/07/2022 1225 AB
Nitrogen, Nitrate+Nitrite (as N)	5.6	mg/L		0.1	EPA 353.2	06/23/2022 1257 AMB
Sulfate	1030	mg/L		2	EPA 300.0	06/07/2022 1225 AB
Calcium	250	mg/L		2	EPA 200.7	06/10/2022 543 DG
Magnesium	49	mg/L		2	EPA 200.7	06/10/2022 543 DG
Potassium	7	mg/L		2	EPA 200.7	06/10/2022 543 DG
Sodium	290	mg/L		3	EPA 200.7	06/10/2022 543 DG
General Parameters						
Total Dissolved Solids (180)	1910	mg/L		20	SM 2540	06/07/2022 1733 AB
Metals - Dissolved						
Arsenic	<0.005	mg/L		0.005	EPA 200.8	06/07/2022 445 MS
Boron	0.3	mg/L		0.1	EPA 200.7	06/10/2022 543 DG
Cadmium	<0.001	mg/L		0.001	EPA 200.8	06/07/2022 445 MS
Lithium	0.11	mg/L		0.01	EPA 200.7	06/10/2022 543 DG
Manganese	0.626	mg/L		0.005	EPA 200.8	06/07/2022 445 MS
Molybdenum	<0.01	mg/L		0.01	EPA 200.8	06/07/2022 445 MS
Selenium	0.135	mg/L		0.005	EPA 200.8	06/07/2022 445 MS
Strontium	3.93	mg/L		0.02	EPA 200.7	06/10/2022 543 DG
Uranium	0.0243	mg/L		0.0003	EPA 200.8	06/07/2022 445 MS
Vanadium	<0.02	mg/L		0.02	EPA 200.8	06/07/2022 445 MS
Radionuclides - Dissolved						
Gross Alpha	22.3	pCi/L		2	SM 7110B	07/11/2022 1518 AEF
Gross Alpha Precision (±)	4.7	pCi/L			SM 7110B	07/11/2022 1518 AEF
Gross Alpha(Excluding Radon and Uranium)	5.8	pCi/L		2	Calculation	07/12/2022 1435 JKG
Gross Alpha Precision (±)	4.7	pCi/L			Calculation	07/12/2022 1435 JKG
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	07/11/2022 1424 WN
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	07/11/2022 1424 WN
Radium 228	1.6	pCi/L		1	Ga-Tech	07/08/2022 017 WN
Radium 228 Precision (±)	1.9	pCi/L			Ga-Tech	07/08/2022 017 WN
Thorium 230	<0.3	pCi/L		0.3	ACW10	07/14/2022 1703 AEF
Thorium 230 Precision (±)	0.04	pCi/L			ACW10	07/14/2022 1703 AEF

Table 4.1-5
Water Quality Analyses for Well S4

No samples collected 1st half of 2022

Table 4.1-6
Water Quality Analyses for Well X



Pace Analytical

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported: 2/25/2022
Report ID: S2202235001

ProjectName: HMC GRP
Lab ID: S2202235-001
ClientSample ID: X
COC: WEB
PWS ID:

WorkOrder: S2202235
CollectionDate: 2/14/2022 9:29:00 AM
DateReceived: 2/16/2022 11:33:00 AM
FieldSampler: EA
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Field						
pH	7.58	s.u.			Field	02/14/2022 929
Anions/Cations						
Chloride	78	mg/L		1	EPA 300.0	02/17/2022 2109 AB
Sulfate	261	mg/L		2	EPA 300.0	02/17/2022 2109 AB
General Parameters						
Total Dissolved Solids (180)	830	mg/L		20	SM 2540	02/18/2022 1247 ACE
Metals - Dissolved						
Molybdenum	0.15	mg/L		0.01	EPA 200.8	02/17/2022 032 MS
Selenium	0.008	mg/L		0.005	EPA 200.8	02/17/2022 032 MS
Uranium	0.0494	mg/L		0.0003	EPA 200.8	02/17/2022 032 MS



Pace Analytical

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 6/6/2022
Report ID: S2205556001

ProjectName: GW (HP-15) H
Lab ID: S2205556-001
ClientSample ID: X
COC: WEB
PWS ID:

WorkOrder: S2205556
CollectionDate: 5/26/2022 11:53:00 AM
DateReceived: 5/27/2022
FieldSampler: SF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Field

pH	7.35	s.u.			Field	05/26/2022 1153
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Anions/Cations

Chloride	92	mg/L		1	EPA 300.0	06/01/2022 1615	AB
Sulfate	283	mg/L		2	EPA 300.0	06/01/2022 1615	AB

General Parameters

pH	8.2	s.u.		0.1	SM 4500 H B	05/29/2022 2333	KAT
Total Dissolved Solids (180)	900	mg/L		20	SM 2540	05/30/2022 1205	AB

Metals - Dissolved

Molybdenum	0.10	mg/L		0.01	EPA 200.8	05/31/2022 2310	MS
Selenium	0.007	mg/L		0.005	EPA 200.8	05/31/2022 2310	MS
Uranium	0.0336	mg/L		0.0003	EPA 200.8	05/31/2022 2310	MS

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)
E Coll Pond	2/14/22	7.10	9.72	15440			1440					11100	22900
	5/5/22	17.20	9.78	32524			2750					21500	41400
Evap Pond 1	3/1/22	15.00	9.09	69830			16000					28900	74200
	5/5/22	18.00	9.02	36490			7350					20900	49000
Evap Pond 2	3/1/22	15.40	9.65	19680			1280					9510	17800
	5/5/22	16.40	9.83	17525			1210					8550	18700
Evap Pond 3A	2/14/22	11.20	9.66	74670			22700					17300	76300
	5/19/22	21.00	9.25	105900			31600					28700	87900
Evap Pond 3B	2/14/22	8.90	9.98	78670			22300					14700	84400
	5/19/22	22.00	9.30	94220			24600					25800	91400
W Coll Pond	2/14/22	3.90	9.88	5296			308					2210	4200
	5/5/22	14.60	10.06	7036			462					3230	6310

f = field measurement
t = analyte, total

Sample Point Name	Date	NO3 (mg/L)	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)
E Coll Pond	2/14/22			<0.025	0.204	45.8	71.3	27.4	31.1					
	5/5/22			<0.025	<0.025	117	102	61.4	50.6					
Evap Pond 1	3/1/22			1.42	16.9	456	4930	269	3110					
	5/5/22			1.11	1.17	131	130	102	99.9					
Evap Pond 2	3/1/22			1.38	1.55	57.3	56.8	16.5	17.4					
	5/5/22			1.25	1.17	53	50.6	16.7	14.9					
Evap Pond 3A	2/14/22			0.156	17	74.1	8830	24.9	2770					
	5/19/22			1.22	2.11	1330	1250	467	423					
Evap Pond 3B	2/14/22			0.061	14.7	76	9660	39.4	5090					
	5/19/22			1.18	0.99	973	941	515	491					
W Coll Pond	2/14/22			0.466	0.494	11.1	14	7.1	8.01					
	5/5/22			0.665	0.65	17.8	17.9	8.8	8.22					

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)
Site Standard Qal aquifer								250				
D1	No Sample in the First Half of 2022											
DD	2/1/22	47.81	13.60	7.23	3699			67.9				
	5/25/22	49.78	13.70	6.77	3380	<5	475	64.7	362	107	8	402
DD2	2/1/22	45.31	12.50	7.01	3002			56.4				
	5/25/22	46.84	12.70	7.01	2676	<5	368	54.4	377	88	8	352
P	6/2/22	41.63	13.60	7.47	1972	<5	250	47	267	49	7	290
S4	No Sample in the First Half of 2022											
X	2/14/22	36.42	15.40	7.58	1189			78				
	5/26/22	32.70	16.10	7.35	1143			92				

= Quality Control Sample

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

f = field measurement

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)
Site Standard Qal aquifer		1500	2734	12	0.32	0.1	0.16			5	0.3	0.02
D1	No Sample in the First Half of 2022											
DD	2/1/22	1780	3470		0.056	<0.01	0.112					
	5/25/22	1980	3600	12.1	0.084	<0.01	0.103	0.2	<1	<1.2	<0.3	<0.02
DD2	2/1/22	1440	2640		<0.005	<0.01	0.226					
	5/25/22	1440	2690	<0.1	<0.005	<0.01	0.212	0.4	1.9	2.30	<0.3	<0.02
P	6/2/22	1030	1910	5.6	0.135	<0.01	0.0243	0.20	1.60	1.80	<0.3	<0.02
S4	No Sample in the First Half of 2022											
X	2/14/22	261	830		0.008	0.150	0.0494					
	5/26/22	283	900		0.007	0.100	0.0336					

= Quality Control Sample

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)
Site Standard							250				
Oal aquifer											
Post Treatment Tank											
SP2	1/28/2022	16.90	6.94	885	< 5	64	56	131	18	3	98
	2/24/2022	15.10	7.50	1104	< 5	84	73	73	24	4	128
	3/31/2022	13.70	6.67	887	< 5	61	56	95	19	3	99
	4/27/2022	19.1	7.66	758	< 5	50	49	98	14	3	81
	5/26/2022	19.9	7.4	1170	< 5	85	76	131	25	5	145
	6/20/2022	21.6	7.33	1000	< 5	71	64	150	21	4	116

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

f = field measurement

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)
Site Standard		1500	2734	12	0.32	0.1	0.16			5	0.3	0.02
Oal aquifer												
Post Treatment Tank												
SP2	1/28/2022	230	540	0.2	< 0.005	<0.01	0.0090	<0.2	<1	<1.2	<0.3	< 0.02
	2/24/2022	381	820	1	0.01	0.02	0.0216	<0.2	1.6	<1.8	0.5	< 0.02
	3/31/2022	246	540	0.5	0.007	0.02	0.0236	<0.2	1.7	<1.9	<0.3	< 0.02
	4/27/2022	188	490	<0.1	< 0.005	0.01	0.0057	<0.2	1.6	<1.8	<0.3	< 0.02
	5/26/2022	332	830	0.3	0.008	0.01	0.0153	<0.2	<1	<1.2	<0.3	< 0.02
	6/20/2022	223	660	<0.1	0.006	0.02	0.0115	<0.2	<1	<1.2	<0.3	< 0.02

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	1/28/2022	17	6.29	27.9	< 5	< 2	4	< 5	< 2	< 2	5
	2/24/2022	14.9	6.36	38.55	< 5	< 2	5	< 5	< 2	< 2	7
	3/31/2022	13.3	7.18	43.77	< 5	< 2	5	< 5	< 2	< 2	8
	4/27/2022	18	9.05	44.9	< 5	< 2	6	5	< 2	< 2	6
	5/26/2022	22.1	6.43	77.7	< 5	< 2	8	12	< 2	< 2	13
	6/20/2022	19.4	6.91	62.5	< 5	< 2	7	5	< 2	< 2	11

Zeolite Treated Water

1200Z Trains 1&2	1/19/2022	8	6.32	2454	< 5	198	146	34	51	8	315
	2/24/2022	6.5	5.9	2375	< 5	200	152	40	51	7	318
	5/19/2022	16.8	6.34	2376	< 5	162	154	110	37	7	287

1200Z Trains 3&4	3/28/2022	9.4	5.54	2144	< 5	145	140	67	40	8	309
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Concentrations greater than site standards are in **bold**.

f = field measurement

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	1/28/2022	4	< 20	0.4	< 0.005	0.02	0.0051	0.05	<2.4	<2.45	<0.3	< 0.01
	2/24/2022	4	20	0.4	< 0.005	0.02	0.001	0.06	2	2.06	0.04	< 0.02
	3/31/2022	5	40	0.5	< 0.005	0.02	0.0022	<0.03	1	<1.03	0.05	< 0.02
	4/27/2022	2	30	1.2	< 0.005	0.01	0.0012	<0.2	<1	<1.2	<0.3	< 0.02
	5/26/2022	6	40	0.9	< 0.005	0.03	0.0085	<0.2	<1	<1.2	<0.3	< 0.02
	6/20/2022	6	40	0.5	< 0.005	0.04	0.0041	<0.2	<1	<1.2	0	< 0.02

Zeolite Treated Water

1200Z Trains 1&2	1/19/2022	991	1940	2.6	0.036	0.01	0.0789	<0.2	2.2	<2.4	<0.3	< 0.02
	2/24/2022	1010	1890	2.4	0.040	0.02	0.109	<0.2	<1	<1.2	<0.3	< 0.02
	5/19/2022	973	1880	2.2	0.041	0.01	0.0153	<0.2	1.7	<1.9	<0.3	< 0.02

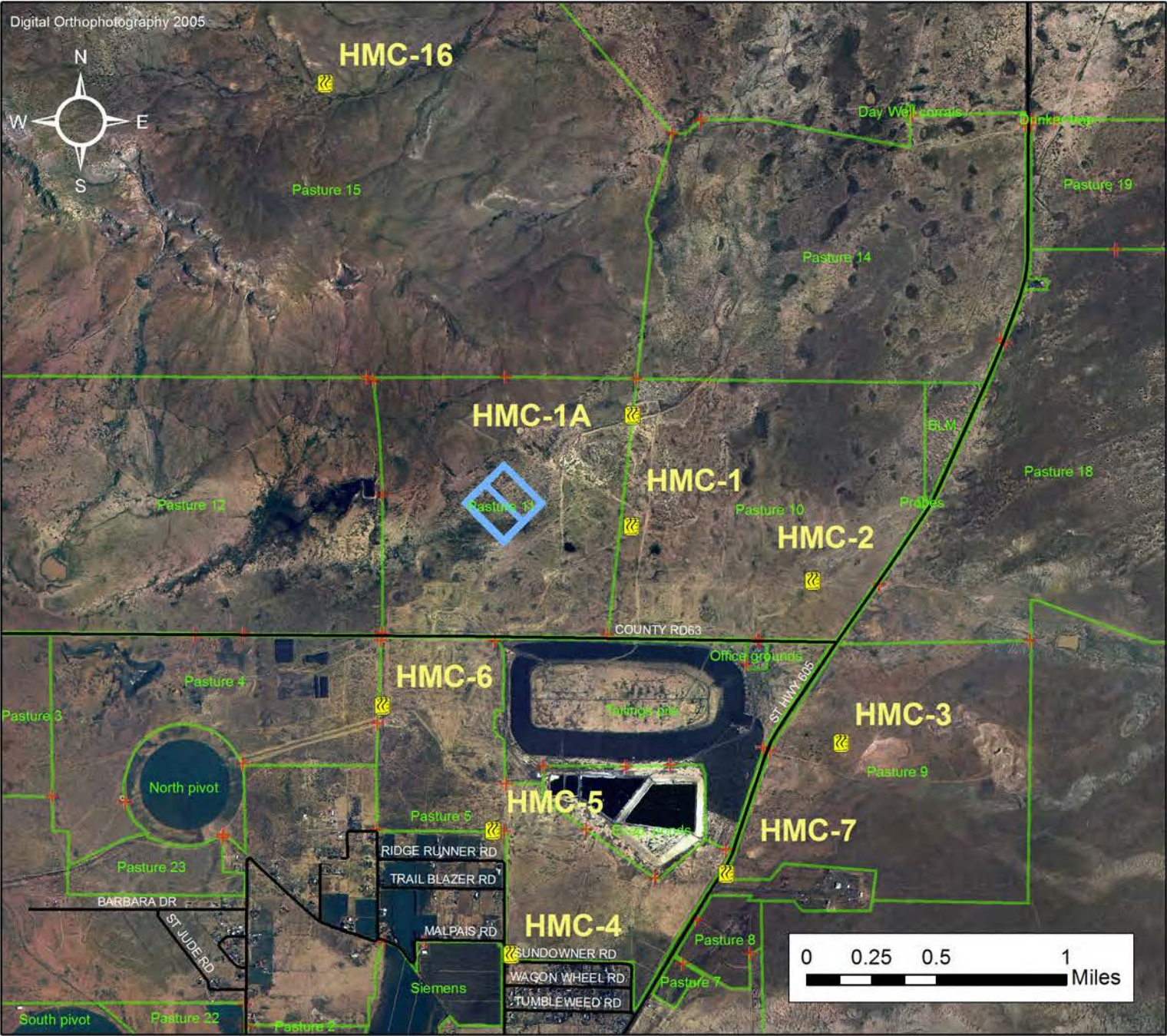
1200Z Trains 3&4	3/28/2022	893	1600	1.3	0.030	<0.01	0.0029	<0.2	<1	<1.2	<0.3	< 0.02
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Concentrations greater than site standards are in **bold**.

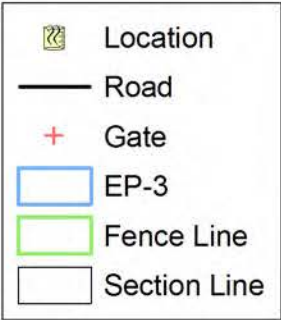
f = field measurement

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



Attachment 1
High Volume Air Sampling Results
(First half of 2022)



Date: 5/4/2022

CLIENT: Barrick Homestake Company
Project: HMC GRP
Lab Order: S2204076

CASE NARRATIVE
Report ID: S2204076001

Entire Report Reviewed by:

Jessica Gillan, Project Manager

Samples HMC-1, HMC-1A, HMC-2, HMC-3, HMC-4, HMC-5, HMC-6 and HMC-7 were received on April 6, 2022.

All samples were received and analyzed within the recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

NRC radiological air particulate filters, animal, vegetation, soil and sediment samples may be composited by date and location per client's monitoring program requirements. Highly carbonaceous samples may require ashing. Samples are subjected to a modified USEPA SW-846 Method 3050B mineral acid digestion as appropriate. Analysis of the resulting solutions and digestates is performed using approved TNI, USEPA, and industry recognized analytical techniques. Where client-provided air volumes corresponding to the air filter composites exist, aqueous digestate results are converted to radiological particulate concentrations in air (e.g. $\mu\text{Ci/mL}$). Quality control parameters acceptance criteria are defined by USEPA programs, and in USNRC Regulatory Guide 4.14 (Radiological Effluent and Environmental Monitoring at Uranium Mills), USNRC Regulatory Guide 4.15 (Quality Assurance for Radiological Monitoring Programs – Effluent Streams and the Environment), the TNI Standard EL-V1-2009, and Pace Analytical (Formerly Inter-Mountain Laboratories) internal quality procedures.

All Quality Control parameters met the acceptance criteria defined by EPA, NRC guidance, and Pace Analytical (Formerly Inter-Mountain Laboratories) except as indicated in this case narrative.



Date: 5/4/2022

Definitions

RL Reporting Limit

Qualifiers

* Value exceeds Maximum Contaminant Level
A Check MSA specifications
B Analyte detected in the associated Method Blank
C Calculated Value
D Report limit raised due to dilution
E Value above quantitation range
G Analyzed at Pace Gillette, WY laboratory
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
L Analyzed by another laboratory
M Value exceeds Monthly Ave or MCL or is less than LCL
ND Not Detected at the Reporting Limit
O Outside the Range of Dilutions
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits
U Analyte below method detection limit
X Matrix Effect



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-001
ClientSample ID: HMC-1
COC: WEB
PWS ID:
Comments 1st Qtr Composite

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	142000000	Liters			Field	04/01/2022 1200	
Radionuclides - Filter							
Radium 226	3.8	pCi/Filter		0.2	SM 7500RAB	04/25/2022 1151	WN
Radium 226 Precision (±)	0.4	pCi/Filter			SM 7500RAB	04/25/2022 1151	WN
Radium 226	2.7E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Radium 226 Precision (±)	2.8E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Thorium 230	2.1	pCi/Filter		0.2	ACW10	04/28/2022 1402	AEF
Thorium-230 Precision (±)	0.5	pCi/Filter			ACW10	04/28/2022 1402	AEF
Thorium 230	1.5E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Thorium 230 Precision (±)	3.5E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Uranium	47.6	pCi/Filter		0.2	EPA 200.8	04/19/2022 024	MS
Uranium	3.3E-16	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Metals - Total							
Vanadium	0.06	mg/Filter		0.02	EPA 200.8	04/19/2022 024	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-002
ClientSample ID: HMC-1A
COC: WEB
PWS ID:
Comments 1st Qtr Composite

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	125000000	Liters			Field	04/01/2022 1200	
Radionuclides - Filter							
Radium 226	2.8	pCi/Filter		0.2	SM 7500RAB	04/25/2022 1413	WN
Radium 226 Precision (±)	0.3	pCi/Filter			SM 7500RAB	04/25/2022 1413	WN
Radium 226	2.2E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Radium 226 Precision (±)	2.4E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Thorium 230	1.8	pCi/Filter		0.2	ACW10	04/28/2022 1402	AEF
Thorium-230 Precision (±)	0.6	pCi/Filter			ACW10	04/28/2022 1402	AEF
Thorium 230	1.5E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Thorium 230 Precision (±)	4.8E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Uranium	131	pCi/Filter		0.2	EPA 200.8	04/19/2022 047	MS
Uranium	1.0E-15	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Metals - Total							
Vanadium	0.09	mg/Filter		0.02	EPA 200.8	04/19/2022 047	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-003
ClientSample ID: HMC-2
COC: WEB
PWS ID:
Comments 1st Qtr Composite

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	151000000	Liters			Field	04/01/2022 1200	
Radionuclides - Filter							
Radium 226	3.1	pCi/Filter		0.2	SM 7500RAB	04/25/2022 1413	WN
Radium 226 Precision (±)	0.3	pCi/Filter			SM 7500RAB	04/25/2022 1413	WN
Radium 226	2.0E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Radium 226 Precision (±)	2.0E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Thorium 230	2.3	pCi/Filter		0.2	ACW10	04/28/2022 1402	AEF
Thorium-230 Precision (±)	0.7	pCi/Filter			ACW10	04/28/2022 1402	AEF
Thorium 230	1.5E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Thorium 230 Precision (±)	4.6E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Uranium	13.8	pCi/Filter		0.2	EPA 200.8	04/19/2022 053	MS
Uranium	<1.0E-16	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Metals - Total							
Vanadium	0.11	mg/Filter		0.02	EPA 200.8	04/19/2022 053	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-004
ClientSample ID: HMC-3
COC: WEB
PWS ID:

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Comments 1st Qtr Composite

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Field

Actual Volume 133000000 Liters Field 04/01/2022 1200

Radionuclides - Filter

Radium 226	3.0	pCi/Filter	0.2	SM 7500RAB	04/25/2022 1413	WN
Radium 226 Precision (±)	0.3	pCi/Filter		SM 7500RAB	04/25/2022 1413	WN
Radium 226	2.2E-17	µCi/mL	1.0E-16	Calculation	05/02/2022 1554	WN
Radium 226 Precision (±)	2.3E-18	µCi/mL		Calculation	05/02/2022 1554	WN
Thorium 230	2.4	pCi/Filter	0.2	ACW10	04/29/2022 748	AEF
Thorium-230 Precision (±)	0.7	pCi/Filter		ACW10	04/29/2022 748	AEF
Thorium 230	1.8E-17	µCi/mL	1.0E-16	Calculation	05/02/2022 1554	WN
Thorium 230 Precision (±)	5.3E-18	µCi/mL		Calculation	05/02/2022 1554	WN
Uranium	16.3	pCi/Filter	0.2	EPA 200.8	04/19/2022 111	MS
Uranium	1.2E-16	µCi/mL	1.0E-16	Calculation	05/02/2022 1554	WN

Metals - Total

Vanadium	0.12	mg/Filter	0.02	EPA 200.8	04/19/2022 111	MS
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Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-005
ClientSample ID: HMC-4
COC: WEB
PWS ID:

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Comments 1st Qtr Composite

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	102000000	Liters			Field	04/01/2022 1200	
Radionuclides - Filter							
Radium 226	6.1	pCi/Filter		0.2	SM 7500RAB	04/25/2022 1413	WN
Radium 226 Precision (±)	0.5	pCi/Filter			SM 7500RAB	04/25/2022 1413	WN
Radium 226	6.0E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Radium 226 Precision (±)	4.9E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Thorium 230	4.6	pCi/Filter		0.2	ACW10	04/29/2022 748	AEF
Thorium-230 Precision (±)	1.3	pCi/Filter			ACW10	04/29/2022 748	AEF
Thorium 230	4.5E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Thorium 230 Precision (±)	1.3E-17	µCi/mL			Calculation	05/02/2022 1554	WN
Uranium	26.5	pCi/Filter		0.2	EPA 200.8	04/19/2022 117	MS
Uranium	2.6E-16	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Metals - Total							
Vanadium	0.28	mg/Filter		0.02	EPA 200.8	04/19/2022 117	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-006
ClientSample ID: HMC-5
COC: WEB
PWS ID:
Comments 1st Qtr Composite

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	125000000	Liters			Field	04/01/2022 1200	
Radionuclides - Filter							
Radium 226	3.2	pCi/Filter		0.2	SM 7500RAB	04/25/2022 1413	WN
Radium 226 Precision (±)	0.3	pCi/Filter			SM 7500RAB	04/25/2022 1413	WN
Radium 226	2.6E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Radium 226 Precision (±)	2.4E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Thorium 230	3.0	pCi/Filter		0.2	ACW10	04/29/2022 748	AEF
Thorium-230 Precision (±)	0.7	pCi/Filter			ACW10	04/29/2022 748	AEF
Thorium 230	2.4E-17	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Thorium 230 Precision (±)	5.6E-18	µCi/mL			Calculation	05/02/2022 1554	WN
Uranium	22.4	pCi/Filter		0.2	EPA 200.8	04/19/2022 123	MS
Uranium	1.8E-16	µCi/mL		1.0E-16	Calculation	05/02/2022 1554	WN
Metals - Total							
Vanadium	0.12	mg/Filter		0.02	EPA 200.8	04/19/2022 123	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-007
ClientSample ID: HMC-6
COC: WEB
PWS ID:

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Comments 1st Qtr Composite

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Field

Actual Volume 138000000 Liters Field 04/01/2022 1200

Radionuclides - Filter

Radium 226	2.5	pCi/Filter	0.2	SM 7500RAB	04/25/2022 1413	WN
Radium 226 Precision (±)	0.3	pCi/Filter		SM 7500RAB	04/25/2022 1413	WN
Radium 226	1.8E-17	µCi/mL	1.0E-16	Calculation	05/02/2022 1554	WN
Radium 226 Precision (±)	2.2E-18	µCi/mL		Calculation	05/02/2022 1554	WN
Thorium 230	2.0	pCi/Filter	0.2	ACW10	04/29/2022 748	AEF
Thorium-230 Precision (±)	0.5	pCi/Filter		ACW10	04/29/2022 748	AEF
Thorium 230	1.4E-17	µCi/mL	1.0E-16	Calculation	05/02/2022 1554	WN
Thorium 230 Precision (±)	3.6E-18	µCi/mL		Calculation	05/02/2022 1554	WN
Uranium	9.2	pCi/Filter	0.2	EPA 200.8	04/19/2022 129	MS
Uranium	<1.0E-16	µCi/mL	1.0E-16	Calculation	05/02/2022 1554	WN

Metals - Total

Vanadium	0.09	mg/Filter	0.02	EPA 200.8	04/19/2022 129	MS
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Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 5/4/2022
Report ID: S2204076001

ProjectName: HMC GRP
Lab ID: S2204076-008
ClientSample ID: HMC-7
COC: WEB
PWS ID:
Comments 1st Qtr Composite

WorkOrder: S2204076
CollectionDate: 4/1/2022 12:00:00 PM
DateReceived: 4/6/2022 2:14:00 PM
FieldSampler: EA
Matrix: Filter

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Radionuclides - Filter

Radium 226	0.4	pCi/Filter		0.2	SM 7500RAB	04/25/2022 1413 WN
Radium 226 Precision (±)	0.1	pCi/Filter			SM 7500RAB	04/25/2022 1413 WN
Thorium 230	0.3	pCi/Filter		0.2	ACW10	04/29/2022 748 AEF
Thorium-230 Precision (±)	0.2	pCi/Filter			ACW10	04/29/2022 748 AEF
Uranium	0.4	pCi/Filter		0.2	EPA 200.8	04/19/2022 135 MS

Metals - Total

Vanadium	<0.02	mg/Filter		0.02	EPA 200.8	04/19/2022 135 MS
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**ANALYTICAL QC SUMMARY REPORT****CLIENT:** Barrick Homestake Company**Date:** 5/4/2022**Work Order:** S2204076**Report ID:** S2204076001**Project:** HMC GRP**Uranium, Air Filter Analysis**Sample Type: **MBLK**

Units: pCi/Filter

MBLK (04/19/22 00:12)	RunNo: 199052							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Uranium	ND	0.2						

Uranium, Air Filter AnalysisSample Type: **LCS**

Units: pCi/Filter

LCS (04/19/22 00:18)	RunNo: 199052							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Uranium	71.7	0.2	67.7		106	85 - 115		

Uranium, Air Filter AnalysisSample Type: **MS**

Units: pCi/Filter

S2204076-001AS (04/19/22 00:36)	RunNo: 199052	PrepDate: 04/13/22 15:01	BatchID: R199052					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Uranium	1560	0.2	1560	47.6	96.9	70 - 130		

Uranium, Air Filter AnalysisSample Type: **MSD**

Units: pCi/Filter

S2204076-001AMSD (04/19/22 00:41)	RunNo: 199052	PrepDate: 04/13/22 15:01	BatchID: R199052					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Uranium	1590	0.2	1560	2.22	99.2	20		

Uranium, Air Filter AnalysisSample Type: **DUP**

Units: pCi/Filter

S2204076-001AD (04/19/22 00:30)	RunNo: 199052	PrepDate: 04/13/22 15:01	BatchID: R199052					
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	
Uranium	46.9	0.2	47.6	1.51		20		

Radium 226 Air Filter AnalysisSample Type: **MBLK**

Units: pCi/Filter

MB-2351 (04/25/22 11:51)	RunNo: 199257	PrepDate: 04/13/22 15:01	BatchID: 19398					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	ND	0.2						

Radium 226 Air Filter AnalysisSample Type: **LCS**

Units: pCi/Filter

LCS-2351 (04/25/22 11:51)	RunNo: 199257	PrepDate: 04/13/22 15:01	BatchID: 19398					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	7.4	0.2	7.84		94.1	76 - 129		

Radium 226 Air Filter AnalysisSample Type: **LCSD**

Units: pCi/Filter

LCSD-2351 (04/25/22 11:51)	RunNo: 199257	PrepDate: 04/13/22 15:01	BatchID: 19398					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226	8.3	0.2	7.4	11.5	106	20		

**ANALYTICAL QC SUMMARY REPORT****CLIENT:** Barrick Homestake Company**Date:** 5/4/2022**Work Order:** S2204076**Report ID:** S2204076001**Project:** HMC GRP**Thorium Air Filter Analysis**Sample Type: **MBLK**

Units: pCi/Filter

MB-845 (04/28/22 14:02)	RunNo: 199370							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Thorium-230

ND

0.2

MB-A207 (04/28/22 14:02)	RunNo: 199370							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Thorium-230

ND

0.2

Thorium Air Filter AnalysisSample Type: **LCS**

Units: pCi/Filter

LCS-845 (04/28/22 14:02)	RunNo: 199370							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Thorium-230

15.4

0.2

12.5

123

72 - 142

Thorium Air Filter AnalysisSample Type: **LCSD**

Units: pCi/Filter

LCSD-845 (04/28/22 14:02)	RunNo: 199370							
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Thorium-230

13.5

0.2

15.4

12.8

108

20

Total (3050) Metals by EPA 200.8-SoilSample Type: **MBLK**

Units: mg/Filter

MBLK (04/19/22 00:12)	RunNo: 199054							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Vanadium

ND

0.02

Total (3050) Metals by EPA 200.8-SoilSample Type: **MS**

Units: mg/Filter

S2204076-001AS (04/19/22 00:36)	RunNo: 199054							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Vanadium

2.26

0.02

2.2

0.06

100

70 - 130

Total (3050) Metals by EPA 200.8-SoilSample Type: **MSD**

Units: mg/Filter

S2204076-001AMSD (04/19/22 00:41)	RunNo: 199054							
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Vanadium

2.21

0.02

2.26

2.26

97.7

20

Total (3050) Metals by EPA 200.8-SoilSample Type: **DUP**

Units: mg/Filter

S2204076-001AD (04/19/22 00:30)	RunNo: 199054							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	

Vanadium

0.05

0.02

0.06

1.29

20

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-1

Lab ID: S2204076-001 1st Qtr Composite					Sample Air Volume: 142000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.8	0.4	2.7E-17	2.8E-18	1E-16	9 E-13	Week	0.0030
Thorium 230	2.1	0.5	1.5E-17	3.5E-18	1E-16	3 E-14	Year	0.050
Uranium	47.6		3.3E-16		1E-16	9 E-14	Year	0.37

Effluent Limits are from 10 CFR Part 20 Appendix B Table 2

ND - Not Detected at the Reporting Limit



Pace Analytical

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-1-A

Lab ID: S2204076-002		Client Sample ID: HMC-1A			Sample Air Volume: 125000000 Liters			
1st Qtr Composite								
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	2.8	0.3	2.2E-17	2.4E-18	1E-16	9 E-13	Week	0.0024
Thorium 230	1.8	0.6	1.5E-17	4.8E-18	1E-16	3 E-14	Year	0.050
Uranium	131		1.0E-15		1E-16	9 E-14	Year	1.1

Effluent Limits are from 10 CFR Part 20 Appendix B Table 2

ND - Not Detected at the Reporting Limit



Pace Analytical

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-2

Lab ID: S2204076-003

Sample Air Volume: 151000000 Liters

1st Qtr Composite

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.1	0.3	2.0E-17	2.0E-18	1E-16	9 E-13	Week	0.0022
Thorium 230	2.3	0.7	1.5E-17	4.6E-18	1E-16	3 E-14	Year	0.050
Uranium	13.8		<1.0E-16		1E-16	9 E-14	Year	0

Effluent Limits are from 10 CFR Part 20 Appendix B Table 2

ND - Not Detected at the Reporting Limit

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-3

Lab ID: S2204076-004					Sample Air Volume: 133000000 Liters			
1st Qtr Composite								
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.0	0.3	2.2E-17	2.3E-18	1E-16	9 E-13	Week	0.0024
Thorium 230	2.4	0.7	1.8E-17	5.3E-18	1E-16	3 E-14	Year	0.060
Uranium	16.3		1.2E-16		1E-16	9 E-14	Year	0.13

Effluent Limits are from 10 CFR Part 20 Appendix B Table 2

ND - Not Detected at the Reporting Limit

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-4

Lab ID: S2204076-005 1st Qtr Composite					Sample Air Volume: 102000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	6.1	0.5	6.0E-17	4.9E-18	1E-16	9 E-13	Week	0.0067
Thorium 230	4.6	1.3	4.5E-17	1.3E-17	1E-16	3 E-14	Year	0.15
Uranium	26.5		2.6E-16		1E-16	9 E-14	Year	0.29



Pace Analytical

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-5

Lab ID: S2204076-006

Sample Air Volume: 125000000 Liters

1st Qtr Composite

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.2	0.3	2.6E-17	2.4E-18	1E-16	9 E-13	Week	0.0029
Thorium 230	3.0	0.7	2.4E-17	5.6E-18	1E-16	3 E-14	Year	0.080
Uranium	22.4		1.8E-16		1E-16	9 E-14	Year	0.20

Effluent Limits are from 10 CFR Part 20 Appendix B Table 2

ND - Not Detected at the Reporting Limit



Pace Analytical

1673 Terra Avenue Sheridan, WY 82801

ph: (307) 672-8945

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-6

Lab ID: S2204076-007

Sample Air Volume: 138000000 Liters

1st Qtr Composite

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	2.5	0.3	1.8E-17	2.2E-18	1E-16	9 E-13	Week	0.0020
Thorium 230	2.0	0.5	1.4E-17	3.6E-18	1E-16	3 E-14	Year	0.047
Uranium	9.2		<1.0E-16		1E-16	9 E-14	Year	0

Effluent Limits are from 10 CFR Part 20 Appendix B Table 2

ND - Not Detected at the Reporting Limit

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-7

Lab ID: S2204076-008					Sample Air Volume:			
1st Qtr Composite								
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
	0.4	0.1				9 E-13	Week	
	0.3	0.2				3 E-14	Year	
	0.4					9 E-14	Year	



Pace Analytical
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page 1 of 1

All shaded fields must be completed.

This is a legal document; any misrepresentation may be construed as fraud.

#WEB

Client Name Homestake Mining Company		Project Identification HMC GRP		Sampler (Signature/Attestation of Authenticity) 		Telephone # (505) 238-4172					
Report Address 560 Anaconda Rd Route 605 Milan, NM 87201		Contact Name Esperanza Aguilar		ANALYSES / PARAMETERS		Save unused portion of the digested sample for one month after reporting results					
Invoice Address Same		Email esperanza.aguilar@barrick.com									
		Phone (505) 238-4172									
		Purchase Order # 4500094065		Quote # 2546/2547							
ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Total Uranium	Total Ra-226	Total Th-30	REMARKS	
1	52204076-001	04/01/22	12:00	HMC-1	FT	1	X	X	X	Total Volume: 1.42E8 L	
2	1st Q -002	04/01/22	12:00	HMC-1A	FT	1	X	X	X	Total Volume: 1.25E8 L	
3	2022 -003	04/01/22	12:00	HMC-2	FT	1	X	X	X	Total Volume: 1.51E8 L	
4	-004	04/01/22	12:00	HMC-3	FT	1	X	X	X	Total Volume: 1.33E8 L	
5	Composite -005	04/01/22	12:00	HMC-4	FT	1	X	X	X	Total Volume: 1.02E8 L	
6	-006	04/01/22	12:00	HMC-5	FT	1	X	X	X	Total Volume: 1.25E8 L	
7	-007	04/01/22	12:00	HMC-6	FT	1	X	X	X	Total Volume: 1.38E7 L	
8	-008	04/01/22	12:00	HMC-7	FT	1	X	X	X		
9											
10											
11											
12											
13											
14											
LAB COMMENTS		Relinquished By (Signature/Printed)		DATE	TIME	Received By (Signature/Printed)		DATE	TIME		
Custody Seal		/ Esperanza Aguilar		4/4/22	12:00			4-6-22	14:14		
SHIPPING INFO		MATRIX CODES		TURN AROUND TIMES		COMPLIANCE INFORMATION		ADDITIONAL REMARKS			
<input type="checkbox"/> UPS		Water WT		Check desired service		Compliance Monitoring ? (Y) / N					
<input checked="" type="checkbox"/> FedEx		Soil SL		<input checked="" type="checkbox"/> Standard turnaround		Program (SDWA, NPDES,...)					
<input type="checkbox"/> USPS		Solid SD		<input type="checkbox"/> RUSH - 5 Working Days		PWSID / Permit #					
<input type="checkbox"/> Hand Carried		Filter FT		<input type="checkbox"/> URGENT - < 2 Working Days		Chlorinated? Y / (N)					
<input type="checkbox"/> Other		Other OT		Rush & Urgent Surcharges will be applied		Sample Disposal: Lab Client					



Survey Meter # Model 2241-2; SN 182115
pH strip lot # HC904495
Thermometer SN# 27130475

Condition Upon Receipt (Attach to COC)

Sample Receipt

1. Number of ice chests/packages received: 1 ROI? Yes ☐ No ☒

Note: as "OTC" if samples are received over the counter, unpackaged

2. Temperature of cooler/samples. (If more than 8 coolers, please write on back)

Temps Observed (°C):	<u>4</u>								
Temps Corrected (°C):	<u>4</u>								

Acceptable is: 0.1° to 10°C for Bacteria; and 0.1° to 6°C for most other water parameters. Samples may not have had adequate time to cool following collection. Indicate ROI (Received on Ice) for iced samples received on the same day as sampled, in addition to temperature at receipt.

Client contact for temperatures outside method criteria must be documented below.

3. Emission rate of samples for radiochemical analyses < 0.5mR/hr? Yes ☐ No ☒ N/A
4. COC Number (if applicable): WEB
5. Do the number of bottles agree with the COC? ☒ Yes ☐ No N/A
6. Were the samples received intact? (no broken bottles, leaks, etc.) ☒ Yes ☐ No N/A
7. Were the sample custody seals intact? ☒ Yes ☐ No N/A
8. Is the COC properly completed, legible, and signed? ☒ Yes ☐ No

Sample Verification, Labeling & Distribution

1. Were all requested analyses understood and appropriate? ☒ Yes ☐ No
2. Did the bottle labels correspond with the COC information? ☒ Yes ☐ No
3. Samples collected in method-prescribed containers? ☒ Yes ☐ No
4. Sample Preservation:

pH at Receipt:	Final pH (if added in lab):	Preservative/Lot#	Date/Time Added:
<u>7.0</u>	<u>7.0</u>	<u>HClO₄</u>	<u></u>
<u>Dist. Water</u>	<u>Dist. Water</u>	<u>Filtered and preserved in metal</u>	<u>Filtered and preserved in metal</u>
<u>Nutrient</u>	<u>Nutrient</u>	<u>H₂SO₄</u>	<u></u>
<u>Oxalate</u>	<u>Oxalate</u>	<u>NaOH</u>	<u></u>
<u>Sulfide</u>	<u>Sulfide</u>	<u>CrAcid</u>	<u></u>
<u>Phenol</u>	<u>Phenol</u>	<u>H₂SO₄</u>	<u></u>
<u>SDWA Facs</u>	<u>SDWA Facs</u>	<u>HNO₃</u>	<u></u>

Preserved samples for Rad analysis accompanied by Field Blank? Yes ☐ No ☐
5. VOA vials have <6mm headspace? ☒ Yes ☐ No N/A
6. Were all analyses within holding time at the time of receipt? ☒ Yes ☐ No
7. Specially requested detection limits (RLs) assigned? ☐ Yes ☐ No N/A
8. Have rush or project due dates been checked and accepted? ☐ Yes ☐ No N/A
9. Do samples require subcontracted analyses? ☐ Yes ☒ No

If "Yes", which type of subcontracting is required?

General

Customer-Specified

Certified

Sample Receipt, Verification, Login, Labeling & Distribution completed by (initials):

Set ID:

52204076

Discrepancy Documentation (use back of sheet for notes on discrepancies)

Any items listed above with a response of "No" or do not meet specifications must be resolved.

Person Contacted: _____ Method of Contact: _____ Phone: _____

Initiated By: _____ Date/Time: _____ Email: _____

Problem: _____

Resolution: _____



Date: 8/8/2022

CLIENT: Barrick Homestake Company
Project: HMC GRP
Lab Order: S2207011

CASE NARRATIVE
Report ID: S2207011001

Entire Report Reviewed by:

Jessica Gillan, Project Manager

Samples HMC-1, HMC-1A, HMC-2, HMC-3, HMC-4, HMC-5, HMC-6 and HMC-7 were received on July 1, 2022.

All samples were received and analyzed within the recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

NRC radiological air particulate filters, animal, vegetation, soil and sediment samples may be composited by date and location per client's monitoring program requirements. Highly carbonaceous samples may require ashing. Samples are subjected to a modified USEPA SW-846 Method 3050B mineral acid digestion as appropriate. Analysis of the resulting solutions and digestates is performed using approved TNI, USEPA, and industry recognized analytical techniques. Where client-provided air volumes corresponding to the air filter composites exist, aqueous digestate results are converted to radiological particulate concentrations in air (e.g. $\mu\text{Ci/mL}$). Quality control parameters acceptance criteria are defined by USEPA programs, and in USNRC Regulatory Guide 4.14 (Radiological Effluent and Environmental Monitoring at Uranium Mills), USNRC Regulatory Guide 4.15 (Quality Assurance for Radiological Monitoring Programs – Effluent Streams and the Environment), the TNI Standard EL-V1-2009, and Pace Analytical (Formerly Inter-Mountain Laboratories) internal quality procedures.

All Quality Control parameters met the acceptance criteria defined by EPA, NRC guidance, and Pace Analytical (Formerly Inter-Mountain Laboratories) except as indicated in this case narrative.



Date: 8/8/2022

Definitions

RL Reporting Limit

Qualifiers

* Value exceeds Maximum Contaminant Level
A Check MSA specifications
B Analyte detected in the associated Method Blank
C Calculated Value
D Report limit raised due to dilution
E Value above quantitation range
G Analyzed at Pace Gillette, WY laboratory
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
L Analyzed by another laboratory
M Value exceeds Monthly Ave or MCL or is less than LCL
ND Not Detected at the Reporting Limit
O Outside the Range of Dilutions
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits
U Analyte below method detection limit
X Matrix Effect



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-001
ClientSample ID: HMC-1
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	137000000	Liters			Field	06/30/2022 1000	
Radionuclides - Filter							
Radium 226	7.7	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556	WN
Radium 226 Precision (±)	0.5	pCi/Filter			SM 7500RAB	08/01/2022 1556	WN
Radium 226	5.7E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Radium 226 Precision (±)	3.6E-18	µCi/mL			Calculation	08/05/2022 1641	WN
Thorium 230	5.2	pCi/Filter		0.2	ACW10	08/01/2022 1250	AEF
Thorium-230 Precision (±)	1.2	pCi/Filter			ACW10	08/01/2022 1250	AEF
Thorium 230	3.8E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Thorium 230 Precision (±)	8.8E-18	µCi/mL			Calculation	08/05/2022 1641	WN
Uranium	138	pCi/Filter		0.2	EPA 200.8	07/26/2022 2229	MS
Uranium	1.0E-15	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Metals - Total							
Vanadium	0.10	mg/Kg		0.02	EPA 200.8	07/26/2022 2229	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-002
ClientSample ID: HMC-1A
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Field

Actual Volume 85600000 Liters Field 06/30/2022 1000

Radionuclides - Filter

Radium 226	9.2	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556	WN
Radium 226 Precision (±)	0.6	pCi/Filter			SM 7500RAB	08/01/2022 1556	WN
Radium 226	1.1E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Radium 226 Precision (±)	7.0E-18	µCi/mL			Calculation	08/05/2022 1641	WN
Thorium 230	7.2	pCi/Filter		0.2	ACW10	08/01/2022 1250	AEF
Thorium-230 Precision (±)	1.4	pCi/Filter			ACW10	08/01/2022 1250	AEF
Thorium 230	8.4E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Thorium 230 Precision (±)	1.6E-17	µCi/mL			Calculation	08/05/2022 1641	WN
Uranium	135	pCi/Filter		0.2	EPA 200.8	07/26/2022 2311	MS
Uranium	1.6E-15	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN

Metals - Total

Vanadium	0.19	mg/Kg		0.02	EPA 200.8	07/26/2022 2311	MS
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Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported: 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-003
ClientSample ID: HMC-2
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Field

Actual Volume 62000000 Liters Field 06/30/2022 1000

Radionuclides - Filter

Radium 226	6.8	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556	WN
Radium 226 Precision (±)	0.5	pCi/Filter			SM 7500RAB	08/01/2022 1556	WN
Radium 226	1.1E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Radium 226 Precision (±)	8.1E-18	µCi/mL			Calculation	08/05/2022 1641	WN
Thorium 230	4.8	pCi/Filter		0.2	ACW10	08/01/2022 1250	AEF
Thorium-230 Precision (±)	1.0	pCi/Filter			ACW10	08/01/2022 1250	AEF
Thorium 230	7.7E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Thorium 230 Precision (±)	1.6E-17	µCi/mL			Calculation	08/05/2022 1641	WN
Uranium	17.7	pCi/Filter		0.2	EPA 200.8	07/26/2022 2318	MS
Uranium	2.9E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN

Metals - Total

Vanadium 0.07 mg/Kg 0.02 EPA 200.8 07/26/2022 2318 MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-004
ClientSample ID: HMC-3
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	138000000	Liters			Field	06/30/2022 1000	
Radionuclides - Filter							
Radium 226	11.1	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556	WN
Radium 226 Precision (±)	0.7	pCi/Filter			SM 7500RAB	08/01/2022 1556	WN
Radium 226	8.1E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Radium 226 Precision (±)	5.1E-18	µCi/mL			Calculation	08/05/2022 1641	WN
Thorium 230	10.6	pCi/Filter		0.2	ACW10	08/01/2022 1250	AEF
Thorium-230 Precision (±)	2.0	pCi/Filter			ACW10	08/01/2022 1250	AEF
Thorium 230	7.7E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Thorium 230 Precision (±)	1.4E-17	µCi/mL			Calculation	08/05/2022 1641	WN
Uranium	76.5	pCi/Filter		0.2	EPA 200.8	07/26/2022 2325	MS
Uranium	5.5E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Metals - Total							
Vanadium	0.14	mg/Kg		0.02	EPA 200.8	07/26/2022 2325	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-005
ClientSample ID: HMC-4
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Field							
Actual Volume	63700000	Liters			Field	06/30/2022 1000	
Radionuclides - Filter							
Radium 226	31.1	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556	WN
Radium 226 Precision (±)	1.1	pCi/Filter			SM 7500RAB	08/01/2022 1556	WN
Radium 226	4.9E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Radium 226 Precision (±)	1.7E-17	µCi/mL			Calculation	08/05/2022 1641	WN
Thorium 230	27.4	pCi/Filter		0.2	ACW10	08/01/2022 1250	AEF
Thorium-230 Precision (±)	6.1	pCi/Filter			ACW10	08/01/2022 1250	AEF
Thorium 230	4.3E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Thorium 230 Precision (±)	9.6E-17	µCi/mL			Calculation	08/05/2022 1641	WN
Uranium	115	pCi/Filter		0.2	EPA 200.8	07/26/2022 2332	MS
Uranium	1.8E-15	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Metals - Total							
Vanadium	0.67	mg/Kg		0.02	EPA 200.8	07/26/2022 2332	MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-006
ClientSample ID: HMC-5
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Field

Actual Volume 125000000 Liters Field 06/30/2022 1000

Radionuclides - Filter

Radium 226	11.3	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556	WN
Radium 226 Precision (±)	0.6	pCi/Filter			SM 7500RAB	08/01/2022 1556	WN
Radium 226	9.0E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Radium 226 Precision (±)	4.8E-18	µCi/mL			Calculation	08/05/2022 1641	WN
Thorium 230	7.6	pCi/Filter		0.2	ACW10	08/01/2022 1250	AEF
Thorium-230 Precision (±)	1.4	pCi/Filter			ACW10	08/01/2022 1250	AEF
Thorium 230	6.1E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN
Thorium 230 Precision (±)	1.1E-17	µCi/mL			Calculation	08/05/2022 1641	WN
Uranium	59.1	pCi/Filter		0.2	EPA 200.8	07/26/2022 2339	MS
Uranium	4.7E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641	WN

Metals - Total

Vanadium 0.21 mg/Kg 0.02 EPA 200.8 07/26/2022 2339 MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-007
ClientSample ID: HMC-6
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Field						
Actual Volume	100000000	Liters			Field	06/30/2022 1000
Radionuclides - Filter						
Radium 226	9.4	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556 WN
Radium 226 Precision (±)	0.6	pCi/Filter			SM 7500RAB	08/01/2022 1556 WN
Radium 226	9.4E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641 WN
Radium 226 Precision (±)	6.0E-18	µCi/mL			Calculation	08/05/2022 1641 WN
Thorium 230	6.3	pCi/Filter		0.2	ACW10	08/01/2022 1250 AEF
Thorium-230 Precision (±)	1.2	pCi/Filter			ACW10	08/01/2022 1250 AEF
Thorium 230	6.3E-17	µCi/mL		1.0E-16	Calculation	08/05/2022 1641 WN
Thorium 230 Precision (±)	1.2E-17	µCi/mL			Calculation	08/05/2022 1641 WN
Uranium	39.8	pCi/Filter		0.2	EPA 200.8	07/26/2022 2346 MS
Uranium	4.0E-16	µCi/mL		1.0E-16	Calculation	08/05/2022 1641 WN
Metals - Total						
Vanadium	0.17	mg/Kg		0.02	EPA 200.8	07/26/2022 2346 MS



Sample Analysis Report

Company: Barrick Homestake Company
560 Anaconda Rd Route 605
Milan, NM 87021

Date Reported: 8/8/2022
Report ID: S2207011001

ProjectName: HMC GRP
Lab ID: S2207011-008
ClientSample ID: HMC-7
COC: WEB
PWS ID:

WorkOrder: S2207011
CollectionDate: 6/30/2022 10:00:00 AM
DateReceived: 7/1/2022 12:50:00 PM
FieldSampler: KM
Matrix: Filter

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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Radionuclides - Filter

Radium 226	0.11	pCi/Filter		0.2	SM 7500RAB	08/01/2022 1556 WN
Radium 226 Precision (±)	0.1	pCi/Filter			SM 7500RAB	08/01/2022 1556 WN
Thorium 230	0.22	pCi/Filter		0.2	ACW10	08/01/2022 1250 AEF
Thorium-230 Precision (±)	0.2	pCi/Filter			ACW10	08/01/2022 1250 AEF
Uranium	0.3	pCi/Filter		0.2	EPA 200.8	07/26/2022 2353 MS

Metals - Total

Vanadium	<0.02	mg/Kg		0.02	EPA 200.8	07/26/2022 2353 MS
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**ANALYTICAL QC SUMMARY REPORT****CLIENT:** Barrick Homestake Company**Date:** 8/8/2022**Work Order:** S2207011**Report ID:** S2207011001**Project:** HMC GRP**Uranium, Air Filter Analysis**Sample Type: **MBLK**

Units: pCi/Filter

MBLK (07/26/22 22:15)	RunNo: 202399							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Uranium

ND

0.2

Uranium, Air Filter AnalysisSample Type: **LCS**

Units: pCi/Filter

LCS (07/26/22 22:22)	RunNo: 202399							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Uranium

68.3

0.2

67.7

101

85 - 115

Uranium, Air Filter AnalysisSample Type: **MS**

Units: pCi/Filter

S2207011-001AS (07/26/22 22:43)	RunNo: 202399	PrepDate: 07/23/22 11:25	BatchID: R202399					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Uranium

1610

0.2

1490

138

98.8

70 - 130

S2207072-001AS (07/27/22 00:27)	RunNo: 202399							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Uranium

734

0.3

745

0.4

98.5

70 - 130

Uranium, Air Filter AnalysisSample Type: **MSD**

Units: pCi/Filter

S2207011-001AMSD (07/26/22 23:04)	RunNo: 202399	PrepDate: 07/23/22 11:25	BatchID: R202399					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Uranium

1600

0.2

1610

0.364

98.4

20

S2207072-001AMSD (07/27/22 00:34)	RunNo: 202399							
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Uranium

738

0.3

734

0.550

99.1

20

Uranium, Air Filter AnalysisSample Type: **DUP**

Units: pCi/Filter

S2207011-001AD (07/26/22 22:36)	RunNo: 202399	PrepDate: 07/23/22 11:25	BatchID: R202399					
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	

Uranium

137

0.2

138

0.787

20

S2207072-001AD (07/27/22 00:07)	RunNo: 202399							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual	

Uranium

0.4

0.3

0.4

0.393

20

Radium 226 Air Filter AnalysisSample Type: **MBLK**

Units: pCi/Filter

MB-2384 (08/01/22 13:45)	RunNo: 202553	PrepDate: 07/23/22 11:25	BatchID: 19730					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

ND

0.2

Radium 226 Air Filter AnalysisSample Type: **LCS**

Units: pCi/Filter

LCS-2384 (08/01/22 13:45)	RunNo: 202553	PrepDate: 07/23/22 11:25	BatchID: 19730					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

7.8

0.2

7.76

100

76 - 129

Radium 226 Air Filter AnalysisSample Type: **LCSD**

Units: pCi/Filter

LCSD-2384 (08/01/22 13:45)	RunNo: 202553	PrepDate: 07/23/22 11:25	BatchID: 19730					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Radium 226

8.1

0.2

7.8

4.63

105

20

**ANALYTICAL QC SUMMARY REPORT****CLIENT:** Barrick Homestake Company**Date:** 8/8/2022**Work Order:** S2207011**Report ID:** S2207011001**Project:** HMC GRP**Thorium Air Filter Analysis**Sample Type: **MBLK**

Units: pCi/Filter

MB-865 (07/30/22 14:28)	RunNo: 202544						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Thorium-230

ND

0.2

MB-A213 (07/31/22 11:46)	RunNo: 202544						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Thorium-230

ND

0.2

MB-A215 (07/31/22 11:46)	RunNo: 202544						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Thorium-230

ND

0.2

Thorium Air Filter AnalysisSample Type: **LCS**

Units: pCi/Filter

LCS-865 (07/30/22 14:28)	RunNo: 202544						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Thorium-230

13.0

0.2

12.5

104

72 - 142

Thorium Air Filter AnalysisSample Type: **LCSD**

Units: pCi/Filter

LCSD-865 (07/30/22 14:28)	RunNo: 202544						
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual

Thorium-230

12.8

0.2

13.0

1.56

102

20

Total (3050) Metals by EPA 200.8-SoilSample Type: **MBLK**

Units: mg/Kg

MBLK (07/26/22 22:15)	RunNo: 202402						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Vanadium

ND

5

Total (3050) Metals by EPA 200.8-SoilSample Type: **MS**

Units: mg/Kg

S2207011-001AS (07/26/22 22:43)	RunNo: 202402						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Vanadium

1.18

0.02

1.1

0.10

98.1

70 - 130

Total (3050) Metals by EPA 200.8-SoilSample Type: **MSD**

Units: mg/Kg

S2207011-001AMSD (07/26/22 23:04)	RunNo: 202402						
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual

Vanadium

1.19

0.02

1.18

0.818

98.9

20

Total (3050) Metals by EPA 200.8-SoilSample Type: **DUP**

Units: mg/Kg

S2207011-001AD (07/26/22 22:36)	RunNo: 202402						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual

Vanadium

0.10

0.02

0.10

0.0877

20

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-1

Lab ID: S2207011-001					Sample Air Volume: 137000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	7.7	0.5	5.7E-17	3.6E-18	1E-16	9 E-13	Week	0.0063
Thorium 230	5.2	1.2	3.8E-17	8.8E-18	1E-16	3 E-14	Year	0.13
Uranium	138		1.0E-15		1E-16	9 E-14	Year	1.1

Lab ID: S2204076-001 1st Qtr Composite					Sample Air Volume: 142000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.8	0.4	2.7E-17	2.8E-18	1E-16	9 E-13	Week	0.0030
Thorium 230	2.1	0.5	1.5E-17	3.5E-18	1E-16	3 E-14	Year	0.050
Uranium	47.6		3.3E-16		1E-16	9 E-14	Year	0.37

Effluent Limits are from 10 CFR Part 20 Appendix B Table 2

ND - Not Detected at the Reporting Limit



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ph: (307) 672-8945

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-1-A

Lab ID: S2207011-002		Client Sample ID: HMC-1A				Sample Air Volume: 85600000 Liters		
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	9.2	0.6	1.1E-16	7.0E-18	1E-16	9 E-13	Week	0.012
Thorium 230	7.2	1.4	8.4E-17	1.6E-17	1E-16	3 E-14	Year	0.28
Uranium	135		1.6E-15		1E-16	9 E-14	Year	1.8

Lab ID: S2204076-002		Client Sample ID: HMC-1A				Sample Air Volume: 125000000 Liters		
1st Qtr Composite								
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	2.8	0.3	2.2E-17	2.4E-18	1E-16	9 E-13	Week	0.0024
Thorium 230	1.8	0.6	1.5E-17	4.8E-18	1E-16	3 E-14	Year	0.050
Uranium	131		1.0E-15		1E-16	9 E-14	Year	1.1



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ph: (307) 672-8945

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-2

Lab ID: S2207011-003					Sample Air Volume: 62000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	6.8	0.5	1.1E-16	8.1E-18	1E-16	9 E-13	Week	0.012
Thorium 230	4.8	1.0	7.7E-17	1.6E-17	1E-16	3 E-14	Year	0.26
Uranium	17.7		2.9E-16		1E-16	9 E-14	Year	0.32

Lab ID: S2204076-003 1st Qtr Composite					Sample Air Volume: 151000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.1	0.3	2.0E-17	2.0E-18	1E-16	9 E-13	Week	0.0022
Thorium 230	2.3	0.7	1.5E-17	4.6E-18	1E-16	3 E-14	Year	0.050
Uranium	13.8		<1.0E-16		1E-16	9 E-14	Year	0



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Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-3

Lab ID: S2207011-004					Sample Air Volume: 138000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	11.1	0.7	8.1E-17	5.1E-18	1E-16	9 E-13	Week	0.0090
Thorium 230	10.6	2.0	7.7E-17	1.4E-17	1E-16	3 E-14	Year	0.26
Uranium	76.5		5.5E-16		1E-16	9 E-14	Year	0.61

Lab ID: S2204076-004 1st Qtr Composite					Sample Air Volume: 133000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.0	0.3	2.2E-17	2.3E-18	1E-16	9 E-13	Week	0.0024
Thorium 230	2.4	0.7	1.8E-17	5.3E-18	1E-16	3 E-14	Year	0.060
Uranium	16.3		1.2E-16		1E-16	9 E-14	Year	0.13

**Air Filter Summary Report****Client: Barrick Homestake Company****Client Sampler ID: HMC-4**

Lab ID: S2207011-005					Sample Air Volume: 63700000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	31.1	1.1	4.9E-16	1.7E-17	1E-16	9 E-13	Week	0.054
Thorium 230	27.4	6.1	4.3E-16	9.6E-17	1E-16	3 E-14	Year	1.4
Uranium	115		1.8E-15		1E-16	9 E-14	Year	2.0

Lab ID: S2204076-005 1st Qtr Composite					Sample Air Volume: 102000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	6.1	0.5	6.0E-17	4.9E-18	1E-16	9 E-13	Week	0.0067
Thorium 230	4.6	1.3	4.5E-17	1.3E-17	1E-16	3 E-14	Year	0.15
Uranium	26.5		2.6E-16		1E-16	9 E-14	Year	0.29



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Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-5

Lab ID: S2207011-006					Sample Air Volume: 125000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	11.3	0.6	9.0E-17	4.8E-18	1E-16	9 E-13	Week	0.010
Thorium 230	7.6	1.4	6.1E-17	1.1E-17	1E-16	3 E-14	Year	0.20
Uranium	59.1		4.7E-16		1E-16	9 E-14	Year	0.52

Lab ID: S2204076-006 1st Qtr Composite					Sample Air Volume: 125000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	3.2	0.3	2.6E-17	2.4E-18	1E-16	9 E-13	Week	0.0029
Thorium 230	3.0	0.7	2.4E-17	5.6E-18	1E-16	3 E-14	Year	0.080
Uranium	22.4		1.8E-16		1E-16	9 E-14	Year	0.20



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ph: (307) 672-8945

Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-6

Lab ID: S2207011-007					Sample Air Volume: 100000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	9.4	0.6	9.4E-17	6.0E-18	1E-16	9 E-13	Week	0.010
Thorium 230	6.3	1.2	6.3E-17	1.2E-17	1E-16	3 E-14	Year	0.21
Uranium	39.8		4.0E-16		1E-16	9 E-14	Year	0.44

Lab ID: S2204076-007 1st Qtr Composite					Sample Air Volume: 138000000 Liters			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Radium 226	2.5	0.3	1.8E-17	2.2E-18	1E-16	9 E-13	Week	0.0020
Thorium 230	2.0	0.5	1.4E-17	3.6E-18	1E-16	3 E-14	Year	0.047
Uranium	9.2		<1.0E-16		1E-16	9 E-14	Year	0



Air Filter Summary Report

Client: Barrick Homestake Company

Client Sampler ID: HMC-7

Lab ID: S2207011-008					Sample Air Volume:			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
	0.11	0.1				9 E-13	Week	
	0.22	0.2				3 E-14	Year	
	0.3					9 E-14	Year	

Lab ID: S2204076-008 1st Qtr Composite					Sample Air Volume:			
Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
	0.4	0.1				9 E-13	Week	
	0.3	0.2				3 E-14	Year	
	0.4					9 E-14	Year	



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Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page 1 of 1

All shaded fields must be completed.

This is a legal document; any misrepresentation may be construed as fraud.


#WEB

Client Name Homestake Mining Company		Project Identification HMC GRP		Sampler (Signature/Attestation of Authenticity) <i>[Signature]</i>		Telephone # (505) 287-1606	
Report Address 560 Anaconda Rd Route 605 Milan, NM 87201		Contact Name Kyle Martinez		ANALYSES / PARAMETERS		save unused portion of the digested sample for one month after reporting results	
Invoice Address Same		Email kmartinez1@barrick.com					
		Phone (505) 287-1606					
		Purchase Order # 4500094065		Quote # 2546/2547			

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Total Uranium	Total Ra-226	Total Th-230						REMARKS
1	S2207011-1	06/30/22	10:00	HMC-1	FT	1	x	x	x						Total Volume: 1.37E+08
2	-2	06/30/22	10:00	HMC-1A	FT	1	x	x	x						Total Volume: 8.56E+07
3	2nd Q 3	06/30/22	10:00	HMC-2	FT	1	x	x	x						Total Volume: 6.20E+07
4	-4	06/30/22	10:00	HMC-3	FT	1	x	x	x						Total Volume: 1.38E+08
5	2022-5	06/30/22	10:00	HMC-4	FT	1	x	x	x						Total Volume: 6.37E+07
6	-6	06/30/22	10:00	HMC-5	FT	1	x	x	x						Total Volume: 1.25E+08
7	Composite-7	06/30/22	10:00	HMC-6	FT	1	x	x	x						Total Volume: 1.00E+08
8	Sample-8	06/30/22	10:00	HMC-7	FT	1	x	x	x						n/a
9															
10															
11															Volume in Liters
12															
13															
14															

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	<i>[Signature]</i> / Kyle Martinez	6-30-22	1000	<i>[Signature]</i>	7/1/22	1200

SHIPPING INFO	MATRIX CODES	TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
<input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter <u>ET</u> Other OT	Check desired service <input checked="" type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input type="checkbox"/> URGENT - < 2 Working Days <i>Rush & Urgent Surcharges will be applied</i>	Compliance Monitoring ? <i>[Signature]</i> Program (SDWA, NPDES,...) <i>[Signature]</i> PWSID / Permit # <i>[Signature]</i> Chlorinated? <i>[Signature]</i> Sample Disposal: Lab <i>[Signature]</i> Client	

	DC#_Title: ENV-FRM-SHRT-0033 v00_Condition Upon Receipt Form Terra Lab
	Effective Date: 05/13/2022

Survey Meter # Model 2241-2; SN 182115
pH strip lot # HC904495
Thermometer SN# 27130475

Condition Upon Receipt (Attach to COC)

Sample Receipt

- 1 Number of ice chests/packages received: 1 ROI? Yes ☐ No ☒
- Note as "OTC" if samples are received over the counter, unpackaged
- 2 Temperature of cooler/samples. (If more than 8 coolers, please write on back)
- | | | | | | | | | |
|-----------------------|--|--|--|--|--|--|--|--|
| Temps Observed (°C): | | | | | | | | |
| Temps Corrected (°C): | | | | | | | | |
- Acceptable is: 0.1° to 10°C for Bacteria; and 0.1° to 6°C for most other water parameters. Samples may not have had adequate time to cool following collection. Indicate ROI (Received on Ice) for iced samples received on the same day as sampled, in addition to temperature at r

Client contact for temperatures outside method criteria must be documented below.

- 3 Emission rate of samples for radiochemical analyses < 0.5mR/hr? Yes ☒ No ☐ N/A
- 4 COC Number (If applicable): web
- 5 Do the number of bottles agree with the COC? Yes ☒ No ☐ N/A
- 6 Were the samples received intact? (no broken bottles, leaks, etc.) Yes ☒ No ☐ N/A
- 7 Were the sample custody seals intact? Yes ☒ No ☐ N/A
- 8 Is the COC properly completed, legible, and signed? Yes ☒ No ☐

Sample Verification, Labeling & Distribution

- 1 Were all requested analyses understood and appropriate? Yes ☒ No ☐
- 2 Did the bottle labels correspond with the COC information? Yes ☒ No ☐
- 3 Samples collected in method-prescribed containers? Yes ☒ No ☐
- 4 Sample Preservation:

pH at Receipt:	Final pH (if added in lab):	Preservative/Lot#	Date/Time Added:
_____ Total Metals	_____ Total Metals	HNO ₃ _____	_____
_____ Diss Metals	_____ Diss Metals	HNO ₃ _____	Filtered and preserved in metal
_____ Nutrient	_____ Nutrient	H ₂ SO ₄ _____	
_____ Cyanide	_____ Cyanide	NaOH _____	
_____ Sulfide	_____ Sulfide	ZnAcet _____	
_____ Phenol	_____ Phenol	H ₂ SO ₄ _____	
_____ SDWA Rads	_____ SDWA Rads	HNO ₃ _____	

- 5 VOA vials have <6mm headspace? Yes ☐ No ☒ N/A
- 6 Were all analyses within holding time at the time of receipt? Yes ☒ No ☐ N/A
- 7 Have rush or project due dates been checked and accepted? Yes ☐ No ☒ N/A
- 8 Do samples require subcontracted analyses? Yes ☐ No ☒

If "Yes", which type of subcontracting is required?

General Customer-Specified Certified

Sample Receipt, Verification, Login, Labeling & Distribution completed by (initials): aul Set ID: 82207011

Discrepancy Documentation (use back of sheet for notes on discrepancies)

Any items listed above with a response of "No" or do not meet specifications must be resolved.

Person Contacted: _____ Method of Contact: _____ Phone: _____

Initiated By: _____ Date/Time: _____ Email: _____

Problem: _____

Resolution: _____

Attachment 2

Radon Gas Monitoring Results

Attachment 2 - Radon Gas Monitoring Results
Track-Etch Passive Survey

Location	Monitoring Period	Rn Concentration ($\mu\text{Ci}/\text{ml}$)	Uncertainty - 2 S.D. ($\mu\text{Ci}/\text{ml}$)	LLD ($\mu\text{Ci}/\text{ml}$)
HMC #1(average) N Outer Perimeter	1/5/2022 - 6/30/2022	7.6E-10	6.1E-10	3.4E-10
HMC #1-A (average) N Outer Perimeter	1/5/2022 - 6/30/2022	6.1E-10	1.4E-10	3.4E-10
HMC #2 (average) NE Outer Perimeter	1/5/2022 - 6/30/2022	8.1E-10	1.8E-10	3.4E-10
HMC #3 (average) E Outer Perimeter	1/5/2022 - 6/30/2022	6.7E-10	1.4E-10	3.4E-10
HMC #4 (average) S Outer Perimeter	1/5/2022 - 6/30/2022	8.0E-10	1.6E-10	3.4E-10
HMC #5 (average) N of Nearest Residence	1/5/2022 - 6/30/2022	8.0E-10	1.6E-10	3.4E-10
HMC #6 (average) W of Outer Perimeter	1/5/2022 - 6/30/2022	6.3E-10	1.4E-10	3.4E-10
HMC #7 (average) S Boundary	1/5/2022 - 6/30/2022	7.6E-10	1.5E-10	3.4E-10
HMC #16 (average) Background	1/5/2022 - 6/30/2022	4.3E-10	1.3E-10	3.4E-10

Attachment 3
Environmental Gamma Radiation Results |

Attachment 3 - 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	1/1/2022 - 6/30/2022	64	6.3
HMC #1-A N Outer Perimeter	1/1/2022 - 6/30/2022	52.8	5.2
HMC #2 NE Outer Perimeter	1/1/2022 - 6/30/2022	56.1	5.5
HMC #3 E Outer Perimeter	1/1/2022 - 6/30/2022	63.7	6.2
HMC #4 S Outer Perimeter	1/1/2022 - 6/30/2022	67.5	6.6
HMC #5 N of Nearest Residence	1/1/2022 - 6/30/2022	62.2	6.1
HMC #6 W of Outer Perimeter	1/1/2022 - 6/30/2022	63.5	6.2
HMC #16 Background	1/1/2022 - 6/30/2022	56.5	5.5

*Error is 1.96 std. dev.

Attachment 4
2022 Annual Radon Flux Report

Radon Flux Measurements for the HMC Grants Tailings Piles

August 2022

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), are being completed in phases in accordance with the approved 1993 Reclamation Plan. 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. Final radon barrier was applied to the north, west, and south side slopes, with completion of the work in 1994. Radon flux measurements were made on the 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. Erosion protection layer (rock mulch) was subsequently placed on the side slopes of the LTP to complete reclamation milestones for those portions of the LTP. An evaporation pond was constructed on the Small Tailings Pile (STP) and an interim cover placed on the remainder of the pile. Initial radon flux measurements were made on the LTP and STP on August 18-19, 1995.

As part of a request for a license amendment extending the milestones in the NRC License for placement of the final radon barrier over the STP and interim cover on the LTP, radon flux measurements were repeated in all areas with interim cover on October 21-22, 2003. This license amendment (Amendment 36) 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 (an average radon flux of 3.27 picocuries per square meter per second (pCi/m²s) was measured in 1995 prior to placement of a final cap of rock armor for erosion control). Only the top of the LTP is currently subject to annual radon flux measurements, and for this objective, 100 measurements are collected annually. With respect to the STP, this is considered an operational impoundment under NRC definitions¹ and the previous method for measurement and calculation of radon flux from STP is consistent with Method 115 specifications for area-weighted averaging of various regions of the pile (water covered portion and earthen covered portions).

Annual flux measurements for calendar year 2022 were made in two separate deployments, consisting of 100 canisters per deployment. The first 100 canister measurements were made on the STP on May 23-24, 2022. The second 100 canister measurements were made on the LTP on June 6-7, 2022. All 200 canister measurements were found usable. The deployment locations, along with annotated 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

¹As 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.

software package Visual Sampling Plan (VSP, 2016). In some cases, small adjustments in planned sampling locations were necessary (e.g., locations that fell on staged equipment or other operational infrastructure (e.g., zeolite water treatment cells) though such adjustments were minimized to the extent possible by selecting the nearest viable measurement location.

2. Radon Flux Results

The results of the 200 flux measurements, consisting of 100 canisters on top of the LTP and 100 canisters 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 only on the top of the LTP. The average measured flux from the top of the LTP for calendar year 2022 is 56.0 pCi/m²s, which exceeds the 20 pCi/m²s standard given in 10 CFR 40, Appendix A. Since the STP is considered an operational impoundment, canisters were placed on earthen regions of the pile (side slopes and southern portion of the STP) as well as on the inside of the berms for Evaporation Pond 1 (EP-1) as the water level in EP-1 was significantly lower in 2022. Area-weighted averaging was used to calculate the average rate of radon emissions from the pile consisting of two regions, including 1) the evaporation pond area (19.2 acres, or 77,623 m², assigned a value of zero radon flux for the calculation), and 2) the earthen covered portions of the pile along with the inside berms of EP-1 (34.0 acres, or 137,455 m², assigned an average measured flux for calendar year 2022 of 29.3 pCi/m²s). All flux measurements were performed in accordance with EPA Method 115. Using Equation 2-1 below, the overall average measured radon flux from the STP for calendar year 2022 is 18.7 pCi/m²s, which meets the flux standard specified in 10 CFR 40 Appendix A.

Equation 2-1:

$$Flux_{STP} = \frac{(0.0 \text{ pCi/m}^2\text{sec} * 77,623 \text{ m}^2) + (29.3 \text{ pCi/m}^2\text{sec} * 137,455 \text{ m}^2)}{(77,623 \text{ m}^2 + 137,455 \text{ m}^2)} = 18.7 \text{ pCi/m}^2\text{s}$$

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.

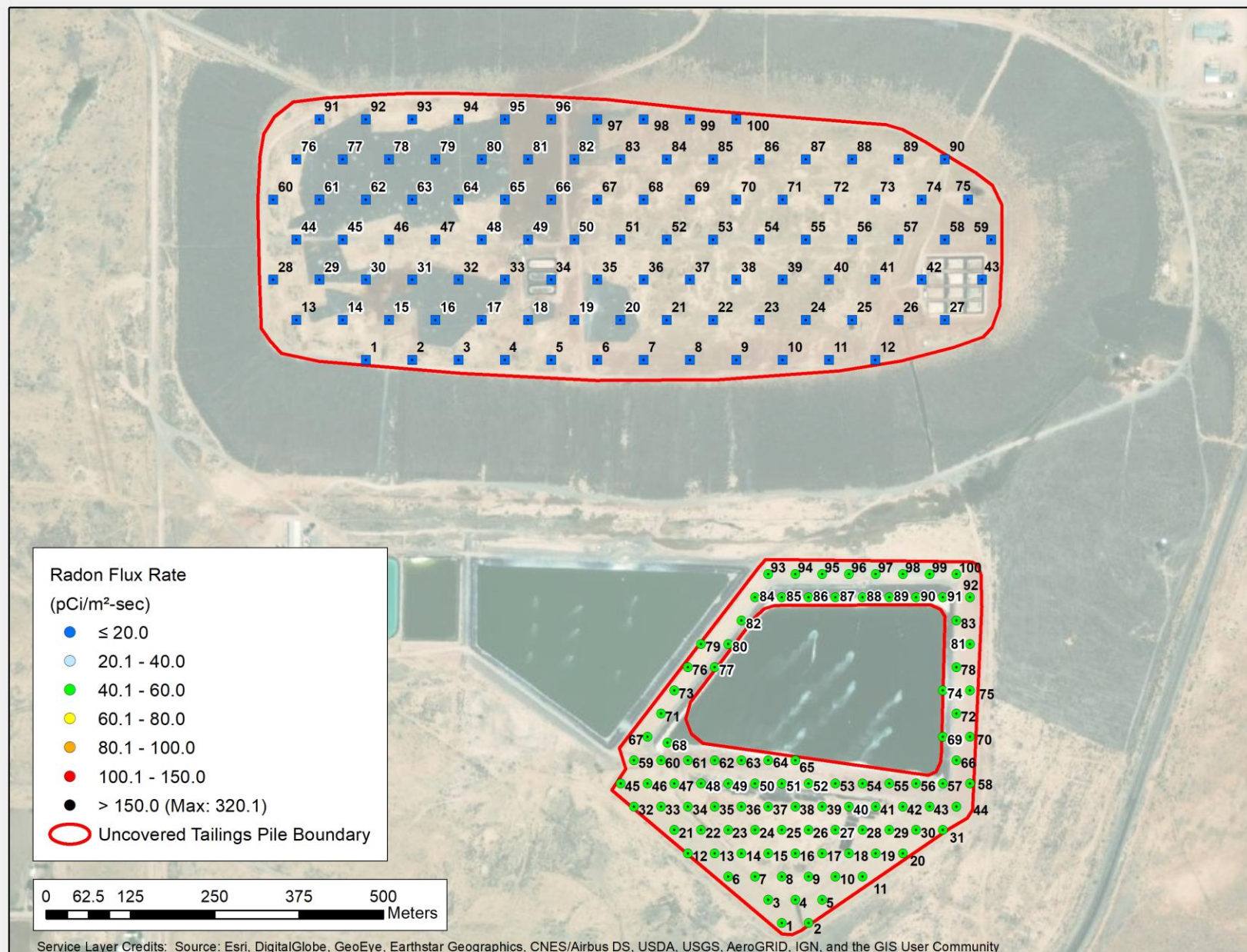


Figure 1-1 Measurement Locations

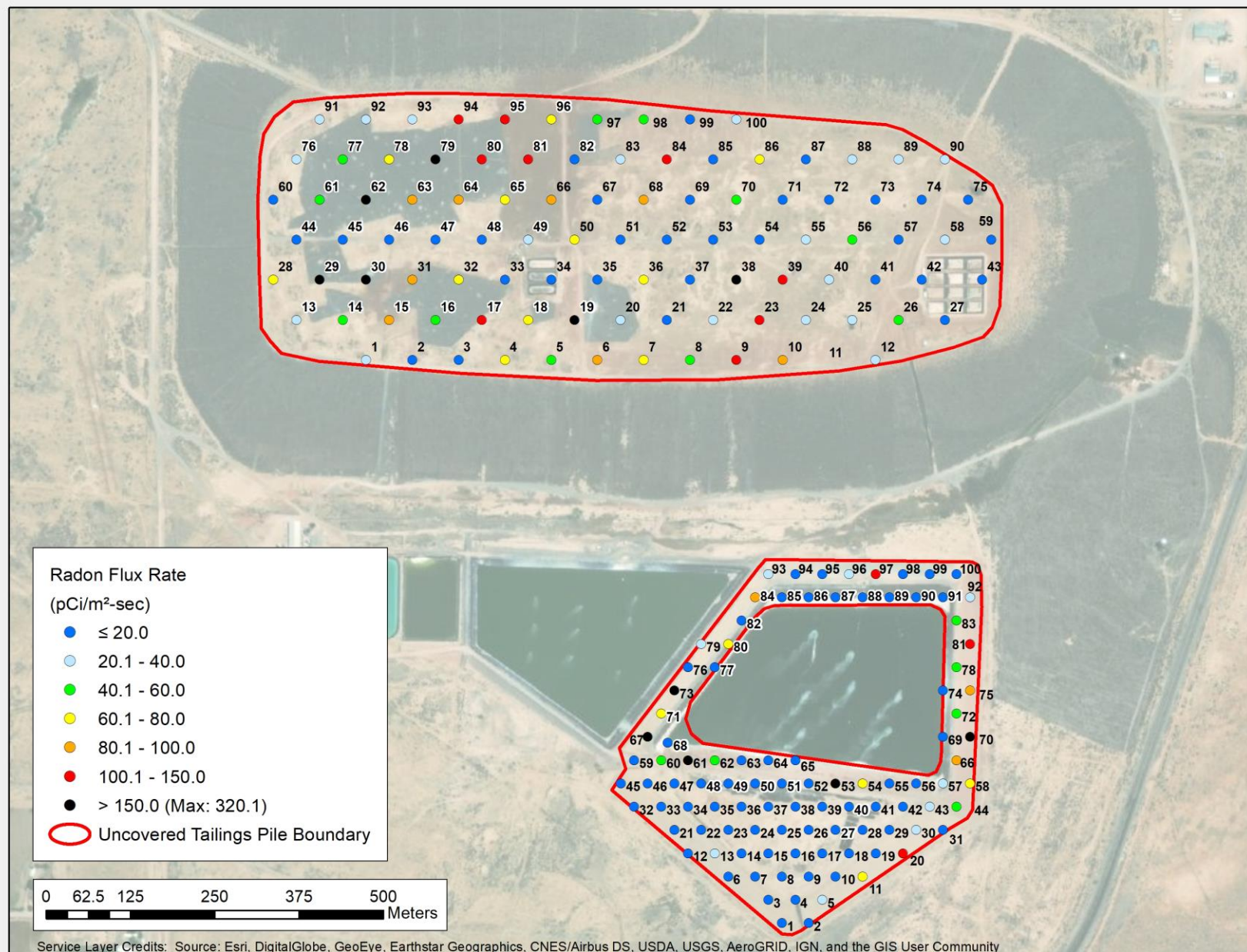


Figure 2-1 Radon Flux Measurement Results

Radon Flux Measurements for the HMC Grants Tailings Piles – August 2022

3. Quality Assurance

The data quality requirements specified in EPA Method 115 were met for the measurements, with one minor exception. One canister on the STP deployment was retrieved four minutes earlier than a full 24-hour deployment; canister number 520 was deployed at STP location 13. This canister's radon flux result of 20.8 pCi/m²sec is included in the 2022 STP average radon flux due to (a) this canister's deployment time is considered sufficiently close enough to the required deployment duration to be included, and (b) including this canister's result in the STP average is conservative in that the canister's result is greater than the STP average of 18.7 pCi/m²sec.

Two independent sources were used to calibrate the spectrometer used to measure radon flux canister samples, and identical geometry conditions to that of the canisters was maintained. 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 less than the 10% accuracy required by EPA Method 115.

Twenty-three 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. Twenty-two 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/m²s. The average RPD for these 22 canisters is 2.2 %.

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 0.02 and 0.22 pCi/m²s are near the expected 0 pCi/m²s 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	5/25/2022	1200	80	45462	3711	0.0118	6.24E-05
STD #3	5/25/2022	1200	78.83	41968	3711	0.0109	6.11E-05
STD #1	5/25/2022	1200	80	46311	3711	0.0120	6.30E-05
STD #3	5/25/2022	1200	78.83	43657	3711	0.0114	6.22E-05
STD #1	5/26/2022	1200	80	46694	2673.5	0.0124	6.26E-05
STD #3	5/26/2022	1200	78.83	43197	2673.5	0.0116	6.12E-05
STD #3	5/26/2022	1200	78.83	43060	2673.5	0.0115	6.11E-05
STD #1	5/26/2022	1200	80	45868	2673.5	0.0122	6.20E-05
STD #1	5/27/2022	1200	80	45605	2793.5	0.0121	6.19E-05
STD #3	5/27/2022	1200	78.83	43875	2793.5	0.0117	6.17E-05
STD #1	5/27/2022	1200	80	45976	2793.5	0.0122	6.22E-05
STD #3	5/27/2022	1200	78.83	43950	2793.5	0.0118	6.18E-05
STD #1	6/7/2022	1200	80	45718	2606	0.0121	6.19E-05
STD #3	6/7/2022	1200	78.83	44246	2606	0.0119	6.18E-05
STD #1	6/7/2022	1200	80	46031	2606	0.0122	6.21E-05
STD #3	6/7/2022	1200	78.83	43751	2606	0.0118	6.15E-05
STD #1	6/8/2022	1200	80	46316	2773.5	0.0123	6.24E-05
STD #3	6/8/2022	1200	78.83	44272	2773.5	0.0119	6.20E-05
STD #1	6/8/2022	1200	80	46346	2773.5	0.0123	6.24E-05
STD #3	6/8/2022	1200	78.83	44150	2773.5	0.0118	6.19E-05
STD #1	6/9/2022	1200	80	45891	2646	0.0122	6.20E-05
STD #3	6/9/2022	1200	78.83	44445	2646	0.0119	6.20E-05
STD #1	6/9/2022	1200	80	45974	2646	0.0122	6.21E-05
STD #3	6/9/2022	1200	78.83	44271	2646	0.0119	6.19E-05
Mean of STD #1 Efficiencies						0.0121	
Mean of STD #3 Efficiencies						0.0117	
Relative Percent Difference of Efficiencies of Standards						3.95%	

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/m ² s)	Analysis 2 (pCi/m ² s)	Average Flux (pCi/m ² s)	RPD (%)
STP	426	6.8	6.9	6.9	1.6
STP	504	8.4	8.3	8.4	1.2
STP	506	2.3	2.3	2.3	1.6
STP	5	27.1	26.9	27	0.8
STP	402	5.7	5.6	5.6	3.1
STP	528	13.9	13.6	13.8	2.3
STP	436	9.9	10.1	10	2.2
STP	510	11.3	11.5	11.4	1.1
STP	485	53.6	57.4	55.5	6.8
STP	422	0.4	-0.1	0.2	n/a
STP	470	6.9	6.7	6.8	2.9
LTP	504	8.4	8.3	8.4	1.2
LTP	430	52.4	52.3	52.4	0.2
LTP	424	39.8	41.1	40.5	3.2
LTP	1	37.8	37	37.4	2
LTP	514	11.7	11.4	11.5	2.8
LTP	422	27.7	27.5	27.6	0.8
LTP	522	81.3	83.1	82.2	2.2
LTP	457	30.5	32	31.3	4.5
LTP	42	90.5	85.8	88.1	5.3
LTP	486	172.6	172.1	172.3	0.3
LTP	479	36	36	36	0
LTP	418	30.8	31.2	31	1.1
Mean of the Duplicate Analyses Relative Percent Differences					2.15 %

Appendix A

Radon Flux Measurement Results



LTP 2022

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/m ² s)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval	Counting							Result	LLD		
1		422	06/06/2022 08:22	06/07/2022 08:33	06/07/2022 14:14	104	2606			5128	0.012	27.48	0.4	0.41	OK
1		422	06/06/2022 08:22	06/07/2022 08:33	06/07/2022 14:17	103	2606	D		5115	0.012	27.69	0.4	0.41	OK
2		492	06/06/2022 08:23	06/07/2022 08:36	06/07/2022 14:32	171	2606			5126	0.012	16.22	0.3	0.25	OK
3		470	06/06/2022 08:24	06/07/2022 08:38	06/07/2022 14:37	148	2606			5114	0.012	18.89	0.3	0.29	OK
4		64	06/06/2022 08:26	06/07/2022 08:39	06/07/2022 14:23	179	2606			19094	0.012	60.87	0.3	0.45	OK
5		506	06/06/2022 08:28	06/07/2022 08:40	06/07/2022 14:44	60	2606			5581	0.012	53.08	0.5	0.74	OK
6		105	06/06/2022 08:29	06/07/2022 08:42	06/07/2022 14:47	60	2606			9017	0.012	86.49	0.5	0.93	OK
7		484	06/06/2022 08:30	06/07/2022 08:43	06/07/2022 14:42	60	2606			7829	0.012	74.87	0.5	0.87	OK
8		428	06/06/2022 08:32	06/07/2022 08:45	06/07/2022 14:49	69	2606			5134	0.012	42.18	0.5	0.62	OK
9		459	06/06/2022 08:33	06/07/2022 08:46	06/07/2022 15:00	60	2606			14857	0.012	143.49	0.5	1.19	OK
10		522	06/06/2022 08:34	06/07/2022 08:48	06/07/2022 14:51	60	2606			8674	0.012	83.08	0.5	0.91	OK
10		522	06/06/2022 08:34	06/07/2022 08:48	06/07/2022 14:58	60	2606	D		8482	0.012	81.28	0.5	0.9	OK
11		517	06/06/2022 08:35	06/07/2022 08:50	06/07/2022 15:03	60	2606			33031	0.012	320.13	0.5	1.77	OK
12		510	06/06/2022 08:36	06/07/2022 08:52	06/07/2022 15:06	81	2606			5124	0.012	35.65	0.5	0.52	OK
13		419	06/06/2022 08:43	06/07/2022 08:56	06/07/2022 15:10	111	2606			5129	0.012	25.75	0.4	0.39	OK
14		407	06/06/2022 08:44	06/07/2022 08:58	06/07/2022 15:08	70	2606			5108	0.012	41.34	0.5	0.61	OK
15		431	06/06/2022 08:45	06/07/2022 09:00	06/07/2022 15:17	60	2606			9904	0.012	95.15	0.5	0.98	OK
16		490	06/06/2022 08:50	06/07/2022 09:02	06/07/2022 15:14	62	2606			5158	0.012	47.38	0.5	0.69	OK
17		451	06/06/2022 08:52	06/07/2022 09:06	06/07/2022 15:19	60	2606			15510	0.012	149.74	0.5	1.22	OK
18		5	06/06/2022 08:54	06/07/2022 09:07	06/07/2022 15:33	60	2606			6619	0.012	63.32	0.5	0.8	OK
19		80	06/06/2022 08:56	06/07/2022 09:09	06/07/2022 15:22	60	2606			22660	0.012	219.49	0.5	1.47	OK
20		457	06/06/2022 08:59	06/07/2022 09:11	06/07/2022 15:27	100	2606	D		5438	0.012	30.55	0.4	0.44	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



LTP 2022

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)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval	Counting						Result	LLD		
20		457	06/06/2022 08:59	06/07/2022 09:11	06/07/2022 15:25	90	2606		5112	0.012	31.96	0.4	0.47	OK
21		412	06/06/2022 08:59	06/07/2022 09:13	06/07/2022 15:36	176	2606		5512	0.012	17.05	0.3	0.26	OK
22		520	06/06/2022 09:01	06/07/2022 09:15	06/08/2022 07:38	164	2773.5		5509	0.0121	20.57	0.4	0.31	OK
23		433	06/06/2022 09:02	06/07/2022 09:16	06/07/2022 15:41	60	2606		11947	0.012	115.22	0.5	1.07	OK
24		468	06/06/2022 09:03	06/07/2022 09:18	06/08/2022 07:42	164	2773.5		5517	0.0121	20.59	0.4	0.31	OK
25		530	06/06/2022 09:05	06/07/2022 09:20	06/08/2022 07:46	130	2773.5		5621	0.0121	26.9	0.4	0.39	OK
26		401	06/06/2022 09:07	06/07/2022 09:22	06/08/2022 07:52	74	2773.5		5563	0.0121	47.92	0.6	0.67	OK
27		523	06/06/2022 09:14	06/07/2022 09:25	06/08/2022 07:55	237	2773.5		5504	0.0121	13.79	0.3	0.22	OK
28		443	06/06/2022 09:20	06/07/2022 09:31	06/08/2022 07:50	60	2773.5		5688	0.0121	60.89	0.6	0.84	OK
29		402	06/06/2022 09:21	06/07/2022 09:33	06/08/2022 08:05	60	2773.5		19488	0.0121	212.52	0.6	1.54	OK
30		504	06/06/2022 09:23	06/07/2022 09:35	06/08/2022 08:08	60	2773.5		19520	0.0121	212.9	0.6	1.54	OK
31		42	06/06/2022 09:25	06/07/2022 09:45	06/08/2022 08:00	60	2773.5		8005	0.0121	85.78	0.6	0.98	OK
31		42	06/06/2022 09:25	06/07/2022 09:45	06/08/2022 08:02	60	2773.5	D	8431	0.0121	90.45	0.6	1.01	OK
32		406	06/06/2022 09:27	06/07/2022 09:47	06/08/2022 08:10	60	2773.5		5974	0.0121	63.7	0.6	0.85	OK
33		426	06/06/2022 09:28	06/07/2022 09:48	06/08/2022 08:51	221	2773.5		5512	0.0121	14.9	0.3	0.23	OK
34		467	06/06/2022 09:30	06/07/2022 09:51	06/08/2022 08:30	1200	2773.5		5592	0.0121	1.54	0.1	0.05	OK
35		512	06/06/2022 09:31	06/07/2022 09:53	06/08/2022 08:12	991	2773.5		5504	0.0121	2.12	0.1	0.06	OK
36		481	06/06/2022 09:33	06/07/2022 09:54	06/08/2022 08:56	60	2773.5		7148	0.0121	76.84	0.6	0.94	OK
37		524	06/06/2022 09:34	06/07/2022 09:55	06/08/2022 09:00	286	2773.5		5511	0.0121	11.16	0.3	0.18	OK
38		486	06/06/2022 09:35	06/07/2022 09:56	06/08/2022 09:08	60	2773.5	D	15863	0.0121	172.6	0.6	1.39	OK
38		486	06/06/2022 09:35	06/07/2022 09:56	06/08/2022 09:06	61	2773.5		16082	0.0121	172.07	0.6	1.37	OK
39		473	06/06/2022 09:36	06/07/2022 09:57	06/08/2022 08:58	60	2773.5		12719	0.0121	137.9	0.6	1.24	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by: _____



LTP 2022

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)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval						Result	LLD		
40		493	06/06/2022 09:38	06/07/2022 09:58	06/08/2022 09:10	127	2773.5	5521	0.0121	27.13	0.4	0.4	OK
41		518	06/06/2022 09:39	06/07/2022 10:00	06/08/2022 10:03	732	2773.5	5781	0.0121	3.71	0.2	0.08	OK
42		445	06/06/2022 09:41	06/07/2022 10:01	06/08/2022 09:40	1200	2773.5	3518	0.0121	0.41	0.1	0.04	OK
43		494	06/06/2022 09:44	06/07/2022 10:08	06/08/2022 09:19	1200	2773.5	4376	0.0121	0.88	0.1	0.05	OK
TB1	TB	91	06/06/2022 14:00	06/07/2022 14:00	06/09/2022 11:10	1200	2646	2676	0.0121	0.02 ✓	0.2	0.05	OK
44		425	06/06/2022 09:50	06/07/2022 10:13	06/08/2022 09:13	283	2773.5	5509	0.0121	11.27	0.3	0.18	OK
TB2	TB	446	06/06/2022 14:00	06/07/2022 14:00	06/09/2022 11:31	1200	2646	2743	0.0121	0.06 ✓	0.2	0.05	OK
45		448	06/06/2022 09:51	06/07/2022 10:15	06/08/2022 10:22	526	2773.5	6987	0.0121	7.27	0.2	0.11	OK
46		507	06/06/2022 09:53	06/07/2022 10:16	06/08/2022 10:17	179	2773.5	5499	0.0121	18.8	0.4	0.28	OK
47		511	06/06/2022 09:54	06/07/2022 10:17	06/08/2022 10:32	503	2773.5	5507	0.0121	5.73	0.2	0.11	OK
48		489	06/06/2022 09:56	06/07/2022 10:18	06/08/2022 10:41	571	2773.5	8360	0.0121	8.19	0.2	0.11	OK
49		479	06/06/2022 09:57	06/07/2022 10:19	06/08/2022 10:56	91	2773.5	5138	0.0121	36.03 ✓	0.5	0.53	OK
49		479	06/06/2022 09:57	06/07/2022 10:19	06/08/2022 10:52	98	2773.5	5534	0.0121	36.01	0.5	0.51	OK
50		477	06/06/2022 09:58	06/07/2022 10:20	06/08/2022 10:59	60	2773.5	7056	0.0121	76.72	0.6	0.94	OK
51		527	06/06/2022 10:00	06/07/2022 10:21	06/08/2022 11:01	1200	2773.5	4617	0.0121	1.02	0.1	0.05	OK
52		427	06/06/2022 10:01	06/07/2022 10:22	06/08/2022 11:27	1200	2773.5	5091	0.0121	1.29	0.1	0.05	OK
53		452	06/06/2022 10:02	06/07/2022 10:23	06/08/2022 11:58	1044	2773.5	6376	0.0121	2.55	0.1	0.06	OK
54		472	06/06/2022 10:04	06/07/2022 10:24	06/08/2022 12:16	428	2773.5	7472	0.0121	10.19	0.2	0.14	OK
55		75	06/06/2022 10:05	06/07/2022 10:25	06/08/2022 11:49	155	2773.5	5513	0.0121	22.29	0.4	0.33	OK
56		502	06/06/2022 10:07	06/07/2022 10:26	06/08/2022 11:54	158	2773.5	13265	0.0121	54.77	0.4	0.5	OK
57		104	06/06/2022 10:10	06/07/2022 10:27	06/08/2022 12:25	726	2773.5	5505	0.0121	3.56	0.2	0.08	OK
58		418	06/06/2022 10:11	06/07/2022 10:28	06/08/2022 12:48	107	2773.5	5125	0.0121	30.82 ✓	0.5	0.46	OK ✓

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



LTP 2022

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)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval						Result	LLD		
58		418	06/06/2022 10:11	06/07/2022 10:28	06/08/2022 12:45	114	2773.5	5519	0.0121	31.16	0.5	0.45	OK
59		525	06/06/2022 10:12	06/07/2022 10:29	06/08/2022 12:51	1149	2773.5	5501	0.0121	1.68	0.1	0.05	OK
60		496	06/06/2022 10:17	06/07/2022 10:33	06/08/2022 12:39	266	2773.5	5529	0.0121	12.48	0.3	0.2	OK
61		49	06/06/2022 10:20	06/07/2022 10:34	06/08/2022 13:19	65	2773.5	5582	0.0121	56.78	0.6	0.79	OK
62		254	06/06/2022 10:21	06/07/2022 10:35	06/08/2022 13:17	60	2773.5	19618	0.0121	220.5	0.7	1.59	OK
63		441	06/06/2022 10:22	06/07/2022 10:36	06/08/2022 13:14	60	2773.5	7915	0.0121	87.98	0.7	1.02	OK
64		2	06/06/2022 10:24	06/07/2022 10:38	06/08/2022 13:12	60	2773.5	8748	0.0121	97.36	0.7	1.07	OK
65		508	06/06/2022 10:25	06/07/2022 10:39	06/08/2022 13:32	60	2773.5	5641	0.0121	62.37	0.7	0.86	OK
66		411	06/06/2022 10:26	06/07/2022 10:40	06/08/2022 13:37	60	2773.5	8806	0.0121	98.3	0.7	1.07	OK
67		461	06/06/2022 10:28	06/07/2022 10:41	06/08/2022 13:21	377	2773.5	5509	0.0121	8.36	0.3	0.14	OK
68		516	06/06/2022 10:29	06/07/2022 10:42	06/08/2022 13:29	60	2773.5	8899	0.0121	99.29	0.7	1.08	OK
69		495	06/06/2022 10:30	06/07/2022 10:43	06/08/2022 13:57	226	2773.5	5523	0.0121	15.1	0.3	0.23	OK
70		430	06/06/2022 10:32	06/07/2022 10:44	06/08/2022 13:39	71	2773.5	5620	0.0121	52.34	0.6	0.73	OK
70		430	06/06/2022 10:32	06/07/2022 10:44	06/08/2022 13:41	70	2773.5	D 5549	0.0121	52.44	0.6	0.74	OK
71		420	06/06/2022 10:33	06/07/2022 10:45	06/08/2022 13:45	277	2773.5	5499	0.0121	11.96	0.3	0.19	OK
72		509	06/06/2022 10:34	06/07/2022 10:46	06/08/2022 13:51	247	2773.5	5502	0.0121	13.62	0.3	0.22	OK
73		480	06/06/2022 10:35	06/07/2022 10:47	06/08/2022 14:12	313	2773.5	5504	0.0121	10.45	0.3	0.17	OK
74		469	06/06/2022 10:37	06/07/2022 10:48	06/08/2022 14:23	450	2773.5	5508	0.0121	6.8	0.2	0.12	OK
75		200	06/06/2022 10:38	06/07/2022 10:49	06/08/2022 14:02	528	2773.5	5506	0.0121	5.55	0.2	0.11	OK
76		429	06/06/2022 10:45	06/07/2022 10:50	06/08/2022 14:20	149	2773.5	5508	0.0121	23.82	0.4	0.35	OK
77		424	06/06/2022 10:47	06/07/2022 10:56	06/08/2022 14:40	91	2773.5	D 5488	0.0121	39.83	0.5	0.57	OK
77		424	06/06/2022 10:47	06/07/2022 10:56	06/08/2022 14:37	89	2773.5	5538	0.0121	41.13	0.5	0.58	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



LTP 2022

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)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval						Result	LLD		
78		528	06/06/2022 10:51	06/07/2022 10:57	06/08/2022 14:44	60	2773.5	7017	0.0121	78.9	0.7	0.97	OK
79		21	06/06/2022 10:54	06/07/2022 10:58	06/08/2022 14:34	60	2773.5	19067	0.0121	217.09	0.7	1.59	OK
80		526	06/06/2022 10:57	06/07/2022 11:00	06/08/2022 14:32	60	2773.5	9542	0.0121	107.86	0.7	1.13	OK
81		410	06/06/2022 10:58	06/07/2022 11:02	06/08/2022 15:36	60	2773.5	11243	0.0121	128.29	0.7	1.23	OK
82		417	06/06/2022 11:00	06/07/2022 11:04	06/08/2022 15:39	350	2773.5	5502	0.0121	9.3	0.3	0.16	OK
83		529	06/06/2022 11:01	06/07/2022 11:05	06/08/2022 15:20	153	2773.5	6730	0.0121	28.82	0.4	0.38	OK
84		312	06/06/2022 11:03	06/07/2022 11:08	06/08/2022 15:24	60	2773.5	9445	0.0121	107.21	0.7	1.13	OK
85		409	06/06/2022 11:04	06/07/2022 11:09	06/08/2022 15:26	523	2773.5	5505	0.0121	5.68	0.2	0.11	OK
86		414	06/06/2022 11:07	06/07/2022 11:10	06/08/2022 15:49	60	2773.5	6727	0.0121	76.21	0.7	0.96	OK
87		487	06/06/2022 11:08	06/07/2022 11:12	06/08/2022 15:52	862	2773.5	10106	0.0121	6.54	0.2	0.09	OK
88		503	06/06/2022 11:09	06/07/2022 11:13	06/08/2022 15:46	104	2773.5	5641	0.0121	35.99	0.5	0.51	OK
89		437	06/06/2022 11:11	06/07/2022 11:19	06/09/2022 10:20	179	2646	6886	0.0121	28.82	0.4	0.38	OK
90		485	06/06/2022 11:12	06/07/2022 11:20	06/09/2022 10:29	149	2646	5507	0.0121	27.65	0.5	0.41	OK
91		1	06/06/2022 11:18	06/07/2022 11:25	06/08/2022 16:08	99	2773.5	5521	0.0121	37.03	0.5	0.53	OK
91		1	06/06/2022 11:18	06/07/2022 11:25	06/08/2022 16:10	98	2773.5	D 5568	0.0121	37.76	0.5	0.54	OK
92		475	06/06/2022 11:19	06/07/2022 11:26	06/09/2022 10:25	156	2646	5511	0.0121	26.33	0.5	0.39	OK
93		488	06/06/2022 11:21	06/07/2022 11:28	06/09/2022 10:33	153	2646	5513	0.0121	26.92	0.5	0.4	OK
94		4	06/06/2022 11:22	06/07/2022 11:29	06/09/2022 10:37	60	2646	8740	0.0121	114.18	0.8	1.25	OK
95		68	06/06/2022 11:23	06/07/2022 11:30	06/09/2022 10:40	60	2646	8957	0.0121	117.09	0.8	1.26	OK
96		101	06/06/2022 11:25	06/07/2022 11:31	06/09/2022 10:42	60	2646	5994	0.0121	77.83	0.8	1.04	OK
97		482	06/06/2022 11:25	06/07/2022 11:32	06/09/2022 11:07	91	2646	5569	0.0121	47.11	0.6	0.67	OK
98		436	06/06/2022 11:27	06/07/2022 11:34	06/09/2022 10:48	91	2646	5540	0.0121	46.74	0.6	0.66	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



LTP 2022


Radon Flux Measurements

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

Location Name	Field Type	Canister Number	Date/Time		Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m ² s)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval							Result	LLD		
99		514	06/06/2022 11:29	06/07/2022 11:34	06/09/2022 10:50	334	2646		5503	0.0121	11.39 ✓	0.3	0.19	OK
99		514	06/06/2022 11:29	06/07/2022 11:34	06/09/2022 10:58	327	2646	D	5516	0.0121	11.71	0.3	0.19	OK
100		498	06/06/2022 11:30	06/07/2022 11:36	06/09/2022 10:44	116	2646		5518	0.0121	36.13	0.5	0.52	OK ✓

Types: D-Duplicate, TB-Trip Blank

Reviewed by:





STP 2022

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/m ² s)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval	Counting							Result	LLD		
STP		496	05/23/2022 09:10	05/24/2022 10:10	05/25/2022 08:39	416	3711			5264	0.0115	6.4	0.3	0.13	OK
STP		2	05/23/2022 09:11	05/24/2022 10:11	05/25/2022 08:27	459	3711			5138	0.0115	5.41	0.3	0.12	OK
STP		426	05/23/2022 13:03	05/24/2022 13:11	05/27/2022 10:45	538	2793.5	D		5104	0.0119	6.82	0.3	0.14	OK
STP		426	05/23/2022 13:03	05/24/2022 13:11	05/27/2022 10:34	547	2793.5			5260	0.0119	6.93	0.3	0.14	OK
STP		504	05/23/2022 13:01	05/24/2022 13:10	05/27/2022 10:14	461	2793.5			5116	0.0119	8.32	0.3	0.16	OK
STP		504	05/23/2022 13:01	05/24/2022 13:10	05/27/2022 10:24	456	2793.5	D		5102	0.0119	8.41	0.3	0.16	OK
STP		461	05/23/2022 09:13	05/24/2022 10:14	05/25/2022 08:48	125	3711			5104	0.0115	25.24	0.5	0.4	OK
STP		451	05/23/2022 13:22	05/24/2022 13:24	05/26/2022 16:31	1088	2673.5			5100	0.0119	2.05	0.2	0.07	OK
STP		518	05/23/2022 12:52	05/24/2022 13:03	05/26/2022 19:12	751	2673.5			5101	0.0119	3.87	0.2	0.09	OK
STP		486	05/23/2022 12:54	05/24/2022 13:04	05/27/2022 09:35	405	2793.5			5107	0.0119	9.7	0.3	0.18	OK
STP		481	05/23/2022 12:56	05/24/2022 13:06	05/27/2022 09:42	340	2793.5			5105	0.0119	11.98	0.4	0.21	OK
STP		467	05/23/2022 12:58	05/24/2022 13:07	05/27/2022 09:50	665	2793.5			5104	0.0119	5.06	0.3	0.12	OK
STP		430	05/23/2022 09:37	05/24/2022 10:16	05/25/2022 08:37	53	3711			5148	0.0115	63.65	0.8	0.93	OK
STP		506	05/23/2022 13:16	05/24/2022 13:21	05/26/2022 15:58	1012	2673.5	D		5105	0.0119	2.33	0.2	0.07	OK
STP		506	05/23/2022 13:16	05/24/2022 13:21	05/26/2022 15:37	1104	2673.5			5529	0.0119	2.3	0.2	0.07	OK
STP		520	05/23/2022 13:05	05/24/2022 13:01	05/26/2022 18:20	256	2673.5			6830	0.0119	20.77	0.4	0.29	OK
STP		523	05/23/2022 12:50	05/24/2022 12:59	05/26/2022 17:36	260	2673.5			5111	0.0119	14.61	0.4	0.24	OK
STP		494	05/23/2022 12:48	05/24/2022 12:58	05/26/2022 18:50	435	2673.5			5102	0.0119	8.03	0.3	0.15	OK
STP		468	05/23/2022 12:45	05/24/2022 12:57	05/26/2022 18:25	310	2673.5			5111	0.0119	12	0.3	0.21	OK
STP		425	05/23/2022 12:43	05/24/2022 12:57	05/26/2022 18:44	234	2673.5			5121	0.0119	16.57	0.4	0.27	OK
STP		493	05/23/2022 12:41	05/24/2022 12:55	05/26/2022 19:05	359	2673.5			5462	0.0119	10.98	0.3	0.19	OK
STP		445	05/23/2022 12:38	05/24/2022 12:54	05/26/2022 18:39	212	2673.5			5230	0.0119	18.88	0.4	0.3	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



STP 2022

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)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval	Counting						Result	LLD		
STP		254	05/23/2022 09:40	05/24/2022 10:18	05/25/2022 12:24	30	3711		5189	0.0115	118.34	1.1	1.69	OK
STP		530	05/23/2022 13:15	05/24/2022 13:19	05/26/2022 16:18	624	2673.5		5131	0.0119	4.98	0.2	0.11	OK
STP		419	05/23/2022 12:20	05/24/2022 12:24	05/26/2022 17:50	419	2673.5		5240	0.0119	8.7	0.3	0.16	OK
STP		80	05/23/2022 12:23	05/24/2022 12:28	05/26/2022 17:00	381	2673.5		5108	0.0119	9.39	0.3	0.17	OK
STP		401	05/23/2022 12:24	05/24/2022 12:29	05/26/2022 17:58	506	2673.5		5112	0.0119	6.66	0.3	0.13	OK
STP		524	05/23/2022 12:26	05/24/2022 12:32	05/26/2022 18:59	332	2673.5		5119	0.0119	11.23	0.3	0.2	OK
STP		433	05/23/2022 12:28	05/24/2022 12:33	05/26/2022 18:07	207	2673.5		5113	0.0119	19.01	0.4	0.31	OK
STP		412	05/23/2022 12:31	05/24/2022 12:49	05/26/2022 18:13	320	2673.5		5120	0.0119	11.55	0.3	0.2	OK
STP		473	05/23/2022 12:33	05/24/2022 12:50	05/26/2022 18:32	319	2673.5		5649	0.0119	13.01	0.3	0.21	OK
STP		490	05/23/2022 12:36	05/24/2022 12:51	05/26/2022 17:41	470	2673.5		5107	0.0119	7.22	0.3	0.14	OK
STP		5	05/23/2022 12:37	05/24/2022 12:53	05/26/2022 17:19	148	2673.5		5112	0.0119	26.92	0.5	0.42	OK
STP		5	05/23/2022 12:37	05/24/2022 12:53	05/26/2022 17:23	147	2673.5	D	5114	0.0119	27.14	0.5	0.42	OK
STP		469	05/23/2022 09:43	05/24/2022 10:20	05/25/2022 08:07	1000	3711		5101	0.0115	1.36	0.2	0.06	OK
STP		402	05/23/2022 13:11	05/24/2022 13:18	05/27/2022 11:06	649	2793.5		5284	0.0119	5.55	0.3	0.12	OK
STP		402	05/23/2022 13:11	05/24/2022 13:18	05/27/2022 11:24	624	2793.5	D	5186	0.0119	5.73	0.3	0.12	OK
STP		512	05/23/2022 13:08	05/24/2022 13:15	05/27/2022 10:03	527	2793.5		5113	0.0119	6.99	0.3	0.14	OK
STP		411	05/23/2022 12:18	05/24/2022 12:23	05/25/2022 16:38	467	3711		5110	0.0115	5.68	0.3	0.13	OK
STP		475	05/23/2022 12:16	05/24/2022 12:22	05/26/2022 09:58	798	2673.5		7816	0.0119	6.03	0.2	0.1	OK
STP		528	05/23/2022 12:14	05/24/2022 12:21	05/25/2022 16:24	232	3711		5105	0.0115	13.63	0.4	0.24	OK
STP		528	05/23/2022 12:14	05/24/2022 12:21	05/25/2022 16:32	228	3711	D	5111	0.0115	13.94	0.4	0.24	OK
STP		505	05/23/2022 12:12	05/24/2022 12:19	05/26/2022 10:30	266	2673.5		5106	0.0119	13.56	0.3	0.23	OK
STP		514	05/23/2022 12:11	05/24/2022 12:19	05/26/2022 10:36	436	2673.5		5717	0.0119	8.7	0.3	0.15	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



STP 2022

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)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval						Result	LLD		
STP		480	05/23/2022 12:09	05/24/2022 12:18	05/25/2022 16:48	406	3711	5107	0.0115	6.85	0.3	0.14	OK
STP		436	05/23/2022 12:06	05/24/2022 12:16	05/26/2022 10:56	351	2673.5	D 5106	0.0119	9.86	0.3	0.18	OK
STP		436	05/23/2022 12:06	05/24/2022 12:16	05/26/2022 10:48	344	2673.5	5102	0.0119	10.08	0.3	0.18	OK
STP		446	05/23/2022 12:04	05/24/2022 12:16	05/26/2022 11:26	549	2673.5	5106	0.0119	5.68	0.2	0.12	OK
STP		4	05/23/2022 12:02	05/24/2022 12:15	05/26/2022 10:21	407	2673.5	6307	0.0119	10.56	0.3	0.17	OK
STP		68	05/23/2022 11:59	05/24/2022 12:14	05/26/2022 10:44	100	2673.5	5111	0.0119	38.96	0.6	0.58	OK
STP		431	05/23/2022 11:57	05/24/2022 13:28	05/26/2022 16:58	90	2673.5	5097	0.0119	43	0.6	0.64	OK
STP		522	05/23/2022 11:30	05/24/2022 11:55	05/26/2022 13:41	1200	2673.5	6479	0.0119	2.58	0.2	0.06	OK
STP		501	05/23/2022 11:34	05/24/2022 11:57	05/26/2022 14:52	383	2673.5	5563	0.0119	10.09	0.3	0.17	OK
STP		517	05/23/2022 11:35	05/24/2022 11:59	05/26/2022 14:38	601	2673.5	6636	0.0119	7.21	0.2	0.12	OK
STP		513	05/23/2022 11:38	05/24/2022 12:00	05/26/2022 13:07	885	2673.5	5098	0.0119	2.86	0.2	0.08	OK
STP		415	05/23/2022 01:14	05/24/2022 12:01	05/26/2022 12:16	1200	2673.5	4220	0.0119	0.75	0.1	0.04	OK
STP		500	05/23/2022 11:42	05/24/2022 12:02	05/26/2022 12:38	838	2673.5	5473	0.0119	3.48	0.2	0.08	OK
STP		94	05/23/2022 11:45	05/24/2022 12:03	05/26/2022 12:53	816	2673.5	5101	0.0119	3.26	0.2	0.08	OK
STP		91	05/23/2022 11:45	05/24/2022 12:05	05/26/2022 11:47	823	2673.5	5100	0.0119	3.18	0.2	0.08	OK
STP		263	05/23/2022 11:46	05/24/2022 12:06	05/26/2022 12:03	60	2673.5	13452	0.0119	178.31	0.8	1.56	OK
STP		515	05/23/2022 11:48	05/24/2022 12:07	05/26/2022 12:14	60	2673.5	5581	0.0119	73.07	0.8	1.01	OK
STP		521	05/23/2022 11:50	05/24/2022 12:08	05/26/2022 12:06	421	2673.5	5581	0.0119	8.87	0.3	0.15	OK
STP		498	05/23/2022 11:51	05/24/2022 12:10	05/26/2022 11:04	1200	2673.5	4256	0.0119	1.05	0.2	0.06	OK
STP		482	05/23/2022 11:54	05/24/2022 12:11	05/26/2022 11:37	138	2673.5	5104	0.0119	27.87	0.5	0.43	OK
STP		509	05/23/2022 09:47	05/24/2022 10:22	05/25/2022 08:26	47	3711	5132	0.0115	71.83	0.9	1.05	OK
STP		510	05/23/2022 11:28	05/24/2022 11:53	05/26/2022 13:24	350	2673.5	5727	0.0119	11.46	0.3	0.19	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



STP 2022

Radon Flux Measurements

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

Location Name	Field Type	Canister Number	Date/Time				Flux (pCi/m²s)							
			Deployment	Retrieval	Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Result	LLD	Error 1.00 S.D.	Remarks
STP		510	05/23/2022 11:28	05/24/2022 11:53	05/26/2022 13:32	356	2673.5	D	5764	0.0119	11.33 ✓	0.3	0.18	OK
STP		105	05/23/2022 11:28	05/24/2022 11:51	05/26/2022 15:34	76	2673.5		5128	0.0119	53.82	0.7	0.79	OK
STP		459	05/23/2022 11:27	05/24/2022 11:49	05/26/2022 15:01	60	2673.5		12081	0.0119	163.72	0.8	1.51	OK
STP		485	05/23/2022 11:23	05/24/2022 11:47	05/25/2022 09:28	59	3711		5163	0.0115	57.38	0.8	0.84	OK
STP		485	05/23/2022 11:23	05/24/2022 11:47	05/26/2022 10:18	93	2673.5	D	6495	0.0119	53.59 ✓	0.6	0.7	OK
STP		428	05/23/2022 11:22	05/24/2022 11:46	05/26/2022 15:21	681	2673.5		5158	0.0119	4.41	0.2	0.1	OK
STP		484	05/23/2022 11:21	05/24/2022 11:45	05/26/2022 15:03	1000	2673.5		5098	0.0119	2.36	0.2	0.07	OK
STP		526	05/23/2022 11:20	05/24/2022 11:44	05/25/2022 08:52	628	3711		5104	0.0115	3.41	0.2	0.09	OK
STP		529	05/23/2022 11:16	05/24/2022 11:43	05/25/2022 11:20	40	3711		5137	0.0115	86.28	0.9	1.25	OK
STP		479	05/23/2022 10:57	05/24/2022 11:31	05/25/2022 12:53	21	3711		5196	0.0115	169.69	1.3	2.4	OK
STP		527	05/23/2022 10:59	05/24/2022 11:32	05/25/2022 12:54	1200	3711		4030	0.0115	0.18	0.2	0.05	OK
STP		200	05/23/2022 11:14	05/24/2022 11:42	05/25/2022 09:06	1200	3711		2857	0.0115	-0.48	0.2	0.05	OK
STP		429	05/23/2022 09:50	05/24/2022 10:25	05/25/2022 08:05	16	3711		5297	0.0115	221.36	1.5	3.08	OK
STP		525	05/23/2022 10:53	05/24/2022 11:30	05/25/2022 12:50	57	3711		5119	0.0115	60.1	0.8	0.88	OK
STP		472	05/23/2022 11:12	05/24/2022 11:40	05/25/2022 12:41	67	3711		5359	0.0115	53.46	0.7	0.77	OK
STP		443	05/23/2022 10:51	05/24/2022 11:24	05/26/2022 17:16	60	2673.5		12626	0.0119	173.48	0.8	1.57	OK
STP		516	05/23/2022 11:10	05/24/2022 11:40	05/25/2022 09:41	1200	3711		3120	0.0115	-0.33	0.2	0.05	OK
STP		1	05/23/2022 09:52	05/24/2022 10:27	05/25/2022 11:58	37	3711		5395	0.0115	99.17	1	1.39	OK
STP		75	05/23/2022 10:49	05/24/2022 11:29	05/25/2022 12:44	232	3711		5099	0.0115	13.06	0.4	0.23	OK
STP		422	05/23/2022 10:37	05/24/2022 11:18	05/27/2022 13:58	1200	2793.5	D	3348	0.0119	0.45 ✓	0.2	0.06	OK
STP		422	05/23/2022 10:37	05/24/2022 11:18	05/25/2022 13:20	1200	3711		3560	0.0115	-0.09	0.2	0.05	OK
STP		418	05/23/2022 11:08	05/24/2022 11:37	05/25/2022 10:16	85	3711		5306	0.0115	40.5	0.6	0.6	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



STP 2022

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)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval						Result	LLD		
STP		452	05/23/2022 10:46	05/24/2022 11:31	05/25/2022 13:16	157	3711	5108	0.0115	20.37	0.5	0.33	OK
STP		410	05/23/2022 10:34	05/24/2022 11:16	05/26/2022 09:29	70	2673.5	5928	0.0119	64.49	0.7	0.87	OK
STP		414	05/23/2022 09:56	05/24/2022 10:29	05/25/2022 12:33	24	3711	5196	0.0115	149.09	1.3	2.11	OK
STP		417	05/23/2022 10:31	05/24/2022 11:15	05/25/2022 16:09	683	3711	5101	0.0115	3.1	0.2	0.09	OK
STP		312	05/23/2022 11:06	05/24/2022 11:36	05/25/2022 10:13	59	3711	5130	0.0115	57.19	0.8	0.84	OK
STP		508	05/23/2022 10:30	05/24/2022 11:05	05/25/2022 15:35	41	3711	5142	0.0115	86.93	1	1.26	OK
STP		101	05/23/2022 10:26	05/24/2022 11:01	05/26/2022 09:34	1200	2673.5	3823	0.0119	0.76	0.2	0.05	OK
STP		409	05/23/2022 10:19	05/24/2022 10:51	05/25/2022 15:49	1101	3711	5101	0.0115	1.1	0.2	0.06	OK
STP		104	05/23/2022 10:20	05/24/2022 10:57	05/25/2022 15:14	1200	3711	4850	0.0115	0.67	0.2	0.05	OK
STP		64	05/23/2022 10:14	05/24/2022 10:41	05/25/2022 14:40	1200	3711	5693	0.0115	1.18	0.2	0.06	OK
STP		492	05/23/2022 10:13	05/24/2022 10:43	05/25/2022 14:09	1200	3711	3846	0.0115	0.08	0.2	0.05	OK
STP		460	05/23/2022 10:06	05/24/2022 10:36	05/25/2022 11:36	1200	3711	4885	0.0115	0.68	0.2	0.05	OK
STP		424	05/23/2022 10:05	05/24/2022 10:34	05/25/2022 11:30	308	3711	5098	0.0115	9.35	0.3	0.18	OK
STP		502	05/23/2022 09:58	05/24/2022 10:31	05/25/2022 12:37	138	3711	5125	0.0115	23.79	0.5	0.38	OK
STP		457	05/23/2022 10:24	05/24/2022 10:58	05/26/2022 16:50	117	2673.5	5113	0.0119	34.54	0.6	0.52	OK
STP		21	05/23/2022 10:23	05/24/2022 10:59	05/25/2022 15:37	185	3711	5097	0.0115	17.39	0.4	0.29	OK
STP		441	05/23/2022 10:18	05/24/2022 10:50	05/25/2022 15:41	384	3711	5107	0.0115	7.29	0.3	0.15	OK
STP		407	05/23/2022 10:17	05/24/2022 10:49	05/26/2022 16:53	126	2673.5	5112	0.0119	32.02	0.5	0.49	OK
STP		437	05/23/2022 10:10	05/24/2022 10:45	05/25/2022 12:00	30	3711	5177	0.0115	117.52	1.1	1.68	OK
STP		420	05/23/2022 10:12	05/24/2022 10:47	05/25/2022 14:32	374	3711	5098	0.0115	7.45	0.3	0.15	OK
STP		470	05/23/2022 10:07	05/24/2022 10:38	05/25/2022 12:15	392	3711	D 5108	0.0115	6.93	0.3	0.14	OK
STP		470	05/23/2022 10:07	05/24/2022 10:38	05/25/2022 12:07	400	3711	5104	0.0115	6.74	0.3	0.14	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by:



STP 2022

Radon Flux Measurements

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

Location Name	Field Type	Canister Number	Date/Time		Counting	Count Time (sec)	BKG Counts	Lab Type	Sample Counts	Efficiency (cps/dps)	Flux (pCi/m ² s)		Error 1.00 S.D.	Remarks
			Deployment	Retrieval							Result	LLD		
STP		488	05/23/2022 10:01	05/24/2022 10:32	05/25/2022 12:02	189	3711		5182	0.0115	16.95	0.4	0.28	OK
STP	TB	406	05/23/2022 09:03	05/24/2022 09:03	05/27/2022 12:01	1200	2793.5		2925	0.0119	0.11 ✓	0.2	0.06	OK
STP	TB	42	05/23/2022 09:03	05/24/2022 09:03	05/27/2022 11:39	1200	2793.5		3064	0.0119	0.22 ✓	0.2	0.06	OK

Types: D-Duplicate, TB-Trip Blank

Reviewed by: C. Far

Appendix B

Field Deployment and Laboratory Analysis Log Forms

ERG Initial MCA Energy Calibration Form

Date: May - 24, 2022 Technician: Tyler Alecksen

MCA Make/Model: Ortec Digi Base Serial Number: 18078558

Detector Make/Model: BICRON 3M3M/3 Serial Number: IR-108

Operating HV: 950 Amplifier Gain: 0.80

Source Nuclide:	<u>Cs-137</u>	
Source Serial Number:	<u>74</u>	
Source γ Decay Energy (keV):	<u>32 KeV, 184 KeV, 601.7 KeV</u>	
Corresponding MCA Channel:	<u>23, 128, 405</u>	

✓ ✓ ✓

MCA Energy Calibration Confirmatory Testing:

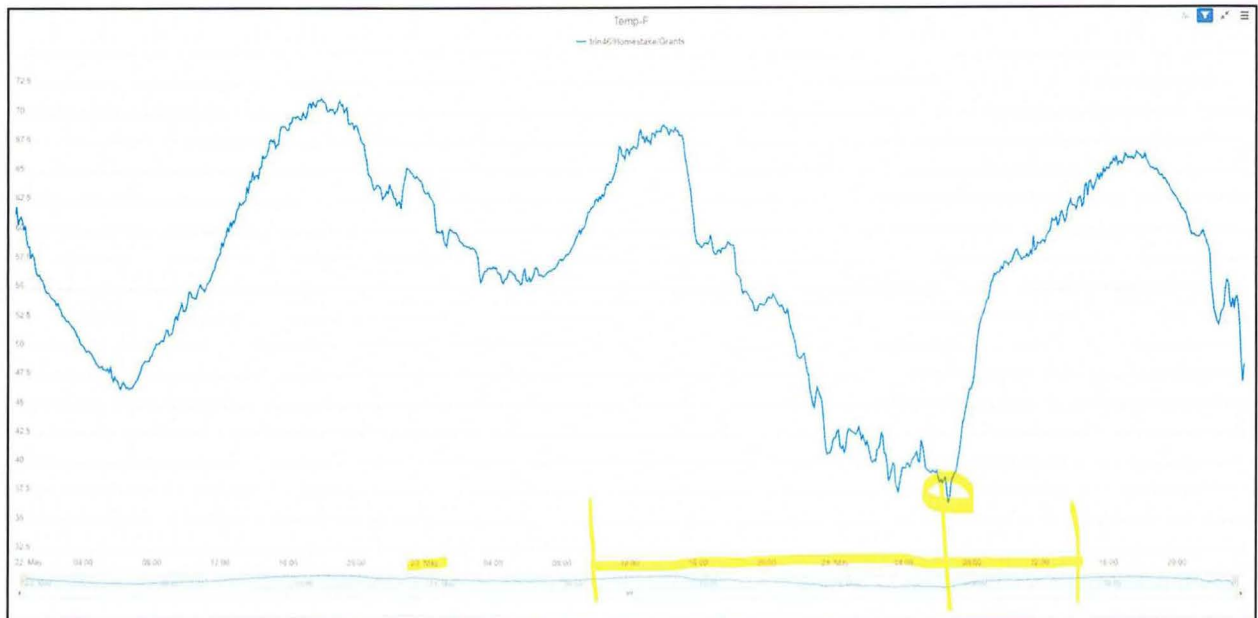
Collect spectrum on ERG STD #1. What is the identified peak energy of ERG STD #1 (keV)?	<u>602 keV</u>	Is this peak energy within 5% of Bi-214 decay energy of 609 keV (579 keV - 639 keV)? Yes/No	<u>Yes</u>
---	----------------	---	------------

Reviewed By: C. J. [Signature]

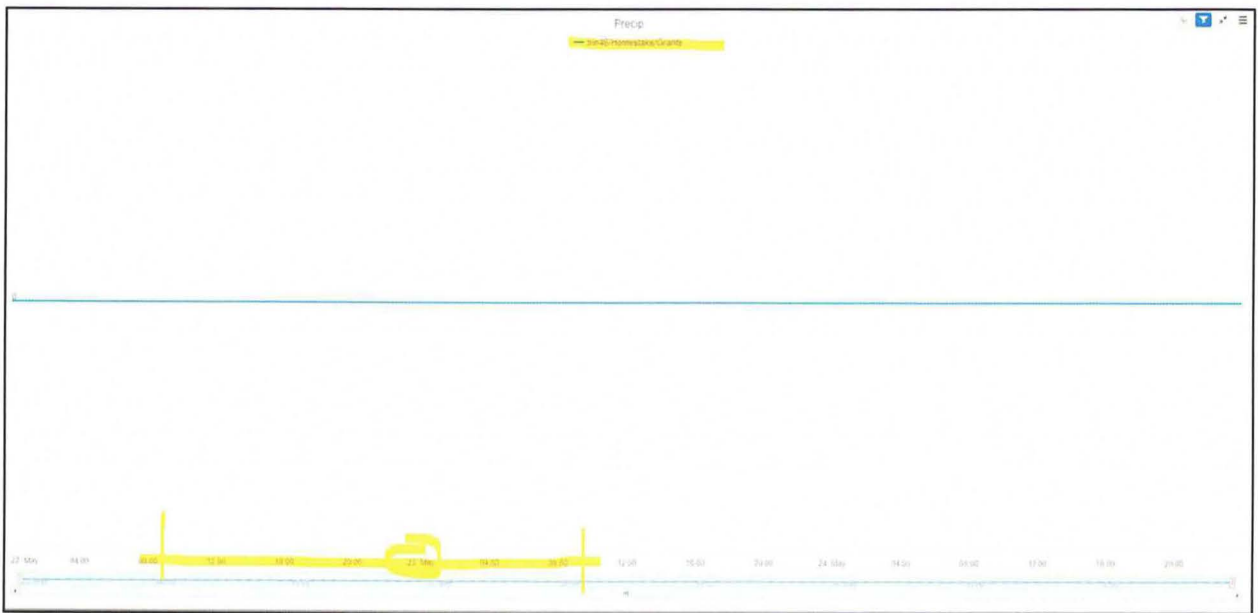
Date: 5/26/2022

STP 2022

Minimum Temperature During Deployment 5/24/22 06:35 36.6 °F



No precipitation in 24 hours pre-deployment.





Canister Deployment and Retrieval Log Form

Site: GMMTS 2022 5/24

• Minimum temperature during canister deployment: 36.6 °F

How was onsite minimum temperature measured? ONSITE MET STATION

• Was there rain onsite in the 24 hours prior to or during deployment? Yes ☐ No ☒ (circle one)

How was the amount of onsite precipitation determined? ONSITE MET STATION

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
1	496	5/23/22	9:10	5-24-22	10:10	
2	2		9:11		10:11	
3	461 ⁴²⁶		9:13 ^{13:03}		13:11	426 @ 13:03
4	430 ⁵⁰⁴		9:37 ^{13:01}		13:13	504 @ 13:01 MOVED OFF ROCKS
5	461		9:13		10:14	
6	451		13:22		13:24	
7	518		12:52		13:03	
8	486		12:54		13:04	
9	481		12:56		13:06	
10	467		12:58		13:07	
11	430		09:37		10:16	
12	506		13:16		13:21	
13	520		13:05		13:01	XX Picked up early
14	523		12:50		12:59	4.1 minutes
15	494		12:48		12:58	Accomplished 99.72% of 24 hr.
16	468		12:45		12:57	
17	425		12:43		12:57	
18	493		12:41		12:55	
19	445		12:38		12:54	
20	254	9:40	9:40		10:18	
21	530		13:15		13:19	
22	419		12:20		12:24	
23	80		12:23		12:28	
24	401		12:24		12:29	
25	524	✓	12:26		12:32	

Review: afm



Canister Deployment and Retrieval Log Form

Site: 14MC GARDNS 2022 STP

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
26	433	5/13/12	12:28	5-24-77	12:33	
27	412		12:31		12:41	
28	473		12:33		12:50	
29	490		12:36		12:51	
30	5		12:37		12:53	
31	469		9:43		10:20	
32	402		13:11		13:18	
33	512		13:08		13:15	
34	411		12:18		12:23	
35	475		12:16		12:22	
36	528		12:14		12:21	
37	505		12:12		12:19	
38	514		12:11		12:19	
39	480		12:09		12:18	
40	436		12:06		12:16	
41	446		12:04		12:16	
42	4		12:02		12:17	
43	68		11:59		12:14	
44	431		11:57		12:13	13:28
45	522		11:30		11:55	
46	501		11:34		11:57	
47	517		11:35		11:59	
48	513		11:38		12:00	
49	415		11:40		12:01	
50	500		11:42		12:02	
51	94		11:45		12:03	(moved 10' OUT OF ROAD)
52	91		11:45		12:05	
53	263		11:46		12:06	
54	515		11:48		12:07	
55	521		11:50		12:08	

Review: _____

C. Brown

ERG Canister Deployment and Retrieval Log Form

Site: GATW 2022 STP

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
56	498	5/23/22	11:51	5-24-22	12:10	
57	482		11:54		12:11	
58	509		9:47		10:22	
59	510		11:28	11:53	11:53	
60	105		11:28		11:51	
61	459		11:27		11:49	
62	485		11:23		11:47	
63	428		11:22		11:46	
64	484		11:21		11:45	
65	526		11:20		11:44	
66	529		11:16		11:43	
67	479		10:57		11:31	
68	527		10:59		11:32	X: 2314190.5 700 50 FT @ Y: 1541540.0 - 0210m 100m
69	200		11:14		11:42	
70	429		9:50		10:25	
71	525		10:53		11:30	
72	472		11:12		11:40	
73	443		10:51		11:24	
74	516		11:10		11:40	on line
75	1		9:52		10:27	
76	75		10:49		11:29	
77	422		10:37		11:18	
78	418		11:08		11:37	
79	452		10:46	11:21	11:31	
80	417 410		10:34		11:16	10:34 410
81	414		9:56		10:29	
82	452 417		10:30 10:31		11:15	10:31 # 417
83	312		11:06		11:36	
84	508		10:30		11:05	
85	101		10:26		11:01	

Review: C. J. J.



Canister Deployment and Retrieval Log Form

Site: GATWTS 2022 STP

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
86	409	5/23/22	10:19	5-24-22	10:51	UNON
87	104		10:20		10:57	SATS
88	64		10:14		10:41	SATS
89	492		10:13		10:43	SATS
90	460		10:06		10:36	SATS
91	424		10:05		10:34	SATS
92	502		9:58		10:31	
93	457		10:24		10:58	
94	21		10:23		10:59	
95	441		10:18		10:50	
96	407		10:17		10:49	
97	437		10:10		10:45	
98	420		10:12		10:47	
99	470		10:07		10:38	
100	488		10:01		10:32	
101						
TB 1 102	406		1200		12:00	TRIP BLANK #1
TB 2 103	42		1200		12:00	TRIP BLANK #2
104						
105			UNOPENED.			
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						

Review: _____

[Signature]

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
8TD#1	A	05-25-22	07:00	1200	45462	DN
8TD#3	A		07:21	1200	41968	
BKG	A		07:43	1200	3280	
429			08:05	16	5297	
469			08:07	1000	5101	
509			08:26	47	5132	
2			08:27	459	5138	
430			08:37	53	5148	
496			08:39	416	5264	
461			08:48	125	5104	
526			08:52	628	5104	↓
200			09:06	1200	2857	RP
485			09:28	59	5163	RP
485B	X		09:37	60	5133	RP
516			09:41	1200	3120	DN
312			10:13	59	5130	
418			10:16	85	5306	
529			11:20	40	5137	
424			11:30	308	5098	
460			11:36	1200	4885	
1			11:58	37	5395	
437			12:00	30	5177	
488			12:02	189	5182	
470			12:07	400	5104	↓
470B	X		12:15	392	5108	RA ✓
254			12:24	30	5189	DN
418-11			12:26	79	5122	
414			12:33	24	5196	
502			12:37	138	5125	
472			12:41	67	5359	

no Review: John

Date: 6/2/22

ALMOVED AS
 DISC DUE TO SAME COUNTS

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
75		05-25-22	12:44	232	5099	DN
525			12:50	57	5119	
479			12:53	21	5196	
527			12:54	1200	4030	
452			13:16	157	5108	
422			13:20	1200	3560	
422B	X		13:47	1200	3382	RP
492			14:09	1200	3846	DN
420			14:32	374	5098	
64			14:40	1200	5693	
104			15:14	1200	4850	
508			15:35	41	5142	
21			15:37	185	5097	
441			15:41	384	5107	
409			15:49	1101	5101	
417			16:09	683	5101	
528			16:24	232	5105	
528B	X		16:32	228	5111	RP
411			16:38	467	5110	RP
480			16:48	406	5107	RP
Standard 1	D		16:56	1200	46311	RP
Standard 3	D		17:24	1200	4643657	RP
Background	D		17:45	1200	4142	RP
STD 1 E		05/26/22	08:10	1200	46694 46,694	cf
STD 3 E			08:43	1200	43197	cf
BKG E			09:06	1200	2796	cf
410			09:29	70	5928	cf
101			09:34	1200	3823	cf

Review: cf

Date: 6/02/2022

Save

D

43657

ROI: 326-393

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
475		05/26/22	09:58	798	7816	DN
485B	X		10:18	93 42.86 ^{dn}	6495	
4			10:21	407	6307	
505			10:30	266	5106	
514			10:36	436	5717	
68			10:44	100	5111	
436			10:48	344	5102	↓
436B	X		10:56	351	5106	RP ✓
498			11:04	1200	4256	DN
446			11:26	549	5106	
482			11:37	138	5104	
91			11:47	823	5100	
263			12:03	60	13452	
521			12:06	421	5581	
515			12:14	60	5581	
415			12:16	1200	4220	
500			12:38	838	5473	
94			12:53	816	5101	
513			13:07	885	5098	
510			13:24	350	5727	↓ DN
510B	X		13:32	356	5764	RP ✓
522			13:41	1200	6479	DN
517			14:38	601	6636	CF
501			14:52	383	5563	DN
459			15:01	60	12081	
484			15:03	1000	5098	
428			15:21	681	5158	
105			15:34	76	5128	↓

 Review: CFM

 Date: 6/2/2022

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
506		05-26-22	15:37	1104	5529	DN
506B	X		15:58	1012	5105	RP ✓
530			16:18	624	5131	DN
451			16:31	1088	5100	
457			16:50	117	5113	
407			16:53	126	5112	
431			16:58	90	5097	
80			17:00	381	5108	
443			17:16	60	4243 12626	
5			17:19	148	5112	DN
58	X		17:23	147	5114	RP
523			17:36	260	5111	DN
490			17:41	470	5107	
419			17:50	419	5240	
401			17:58	506	5112	
433			18:07	207	5113	
412			18:13	320	5120	
520			18:20	256	4830	
478 ^(D) 468			18:25	310	5111	
473			18:32	319	5649	
445			18:39	212	5230	
425			18:44	234	5121	
494			18:50	435	5102	
524			18:59	332	5119	
493			19:05	359	5462	
518			19:12	751	5101	
STD-3F	D		19:27	1200	43060	
STD-1F	D		19:49	1200	45868	
BKGF	D		20:50	1200	2551	

Review: C. J. [Signature]

Date: 6/2/2022

>OK
 >OK dn
 5-27
 >OK
 >OK dn
 5-27
 >OK

Date: 6/2/2022

ERG Initial MCA Energy Calibration Form

Date: 6/7/2022 Technician: CJann

MCA Make/Model: ORTEC DigiBASE Serial Number: 18078558

Detector Make/Model: BICRON 3M3M/3 Serial Number: IR-108

Operating HV: 950 VOLTS Amplifier Gain: 0.80

Source Nuclide:	<u>Cs-137</u>			
Source Serial Number:	<u>4097-03</u>			
Source γ Decay Energy (keV):	<u>32</u>	<u>185</u>	<u>662</u>	<u>keV</u>
Corresponding MCA Channel:	<u>21</u>	<u>122</u>	<u>390</u>	

MCA Energy Calibration Confirmatory Testing:

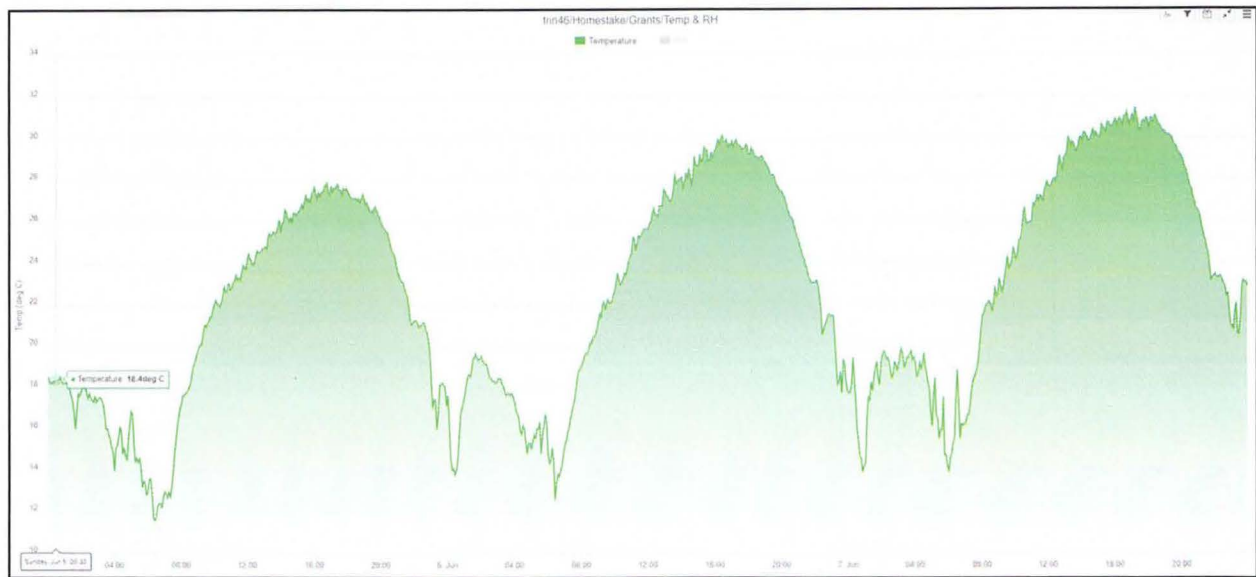
Collect spectrum on ERG STD #1. What is the identified peak energy of ERG STD #1 (keV)?	<u>605</u>	Is this peak energy within 5% of Bi-214 decay energy of 609 keV (579 keV - 639 keV)? Yes/No	<u>YES</u>
---	------------	---	------------

Reviewed By: CJann

Date: 6/7/22

LTP 2022

Minimum Temperature During Deployment: 6/6/22 06:40 12.6 C (54.7 F)



No precipitation in 24 hours pre-deployment.



ERG Canister Deployment and Retrieval Log Form

Site: ITMC OPAW/S
LTJ 2022

• Minimum temperature during canister deployment: 547 °F

How was onsite minimum temperature measured? ONSITE MGT STATION

• Was there rain onsite in the 24 hours prior to or during deployment? Yes ☐ No ☒ (circle one)

How was the amount of onsite precipitation determined? ONSITE MGT STATION

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
1	422	6/6/22	8:22	06/07/22	08:33	
2	492		8:23		08:36	
3	470		8:24		08:38	
4	64		8:26		08:39	
5	506		8:28		08:40	
6	105		8:29		08:42	
7	484		8:30		08:43	
8	428		8:32		08:45	
9	459		8:33		08:46	
10	522		8:34		08:48	
11	517		8:35		08:50	
12	510		8:36		08:52	
13	419		8:43		08:56	
14	407		8:44		08:58	
15	431		8:45		09:00	
16	490		8:50		09:02	
17	451		8:52		09:06	
18	5		8:54		09:07	
19	80		8:56		09:09	
20	457		8:59		09:11	Moved 18m east ✓
21	412		8:59		09:13	
22	520		9:01		09:15	
23	433		9:02		09:16	
24	468		9:03		09:18	
25	530		9:05		09:20	

Review: Cofa



Canister Deployment and Retrieval Log Form

Site: HMC GAAPS LTP
2022

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
26	401	06/06/22	09:07	06-07-22	09:22	
27	523		9:14		09:25	
28	443		9:20		09:31	
29	402		9:21		09:33	
30	504		9:23		09:35	
31	42		9:25		09:45	
32	406		9:27		09:47	MOVED 12 M NORTH off ROCKS ✓
33	426		9:28		09:48	
34	467		9:30		09:51	BETWEEN CELLS ON 300 GPM 200 LPS ✓
35	512		9:31		09:53	
36	481		9:33		09:54	
37	524		9:34		09:55	
38	486		9:35		09:56	
39	473		9:36		09:57	
40	493		9:38		09:58	
41	518		9:39		10:00	
42	445		9:41		10:01	
43	494		9:44		10:08	JUST off 1200 ECO 200L ✓
44	425		9:50		10:13	
45	448		9:51		10:15	
46	507		9:53		10:16	
47	511		9:54		10:17	
48	489		9:56		10:18	
49	479		9:57		10:19	
50	477		9:58		10:20	
51	527		10:00		10:21	
52	427		10:01		10:22	
53	452		10:02		10:23	
54	472		10:04		10:24	
55	75		10:05		10:25	

Review: C. Fan



Canister Deployment and Retrieval Log Form

Site: HMC LTP 2012

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
56	502	06/06/22	10:07	06-07-22	10:26	
57	104		10:10		10:27	
58	418		10:11		10:28	
59	525		10:12		10:29	
60	496		10:17		10:33	
61	49		10:20		10:34	Moved 10 m E. of location
62	254		10:20	10:21	10:35	
63	441		10:22		10:36	
64	2		10:24		10:38	
65	508		10:25		10:39	
66	411		10:26		10:40	
67	461		10:28		10:41	
68	516		10:29		10:42	
69	495		10:30		10:43	
70	430		10:32		10:44	
71	420		10:33		10:45	
72	509		10:34		10:46	
73	480		10:35		10:47	
74	469		10:37		10:48	
75	200		10:38		10:51	10:49
76	429		10:45		10:50	
77	424 -		10:47		10:56	10m Northeast
78	528 -		10:51		10:57	5m east
79	21 -		10:54		10:58	10m Northeast
80	526 -		10:57		11:00	
81	410 -		10:58		11:02	
82	417 -		11:00		11:04	
83	529 -		11:01		11:05	
84	312 -		11:03		11:08	
85	409 -		11:04		11:09	

Review: John



Canister Deployment and Retrieval Log Form

Site: HMC GRANTS LTP
2022

Location Number	Canister Number	Deployment Date (mm/dd/yy)	Deployment Time (24:00)	Retrieval Date (mm/dd/yy)	Retrieval Time (24:00)	Comments
86	414 -	06/06/22	11:07	06/07/22	11:10	
87	487 -		11:08		11:12	
88	503 -		11:09		11:13	
89	437		11:11		11:19	
90	485		11:12		11:20	
91	1		11:18		11:25	
92	475		11:19		11:26	
93	488		11:21		11:28	
94	4		11:22		11:29	
95	68		11:23		11:30	
96	101		11:25		11:31	
97	482		11:25		11:32	10 m SE relocation
98	436		11:27		11:34	
99	514		11:29		11:34	
100	498		11:30		11:36	
101						
102						
103						
104						
105						
106						
107						
108						
109						
110						
111						
112						
113						
114						
115						

Review: C. Fran

67 channels

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
STD 1A		6/7/22	10:41	1200	45718	cf
STD 3A			11:03	1200	44246	cf
BKG A			11:27	1200	2580	cf
* 422			14:14	104	5128	DN
D 422B	✓		14:17	103	5115	RP
64			14:23	179	19094	DN
492			14:32	171	5126	
470			14:37	148	5114	
484			14:40	2 dn	5140 dn	
484			14:42	60	7829	
506			14:44	60	5581	
105			14:47	60	9017	
428			14:49	69	5134	
522			14:51	60	8674	
D * 522B	✓		14:58	60	8482	cf
459			15:00	60	14857	DN
517			15:03	60	33031	✓
510			15:06	81	5124	
407			15:08	70	5108	
419			15:10	111	5129	
490			15:14	62	5158	
431			15:17	60	9904	
451			15:19	60	15510	
80			15:22	60	22660	
* 457			15:25	90	5112	
D 457B	✓		15:27	100	5438	cf
5			15:33	60	6619	DN
412			15:36	176	5512	
433		✓	15:41	60	11947	

28

Review: cf Jones

Date: 6/17/22

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Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
STD1B		06/07/22	15:46	1200	46031	DN
STD3B		↓	16:07	1200	43751	↓
BKGB		↓	16:28	1200	2632	↓
STD1C		06/08/22	06:29	1200	46316	DN
STD3C		↓	06:56	1200	44272	↓
BKGC		↓	07:16	1200	2887	↓
520		↓	07:38	164	5509	↓
468		↓	07:42	164	5517	↓
530		↓	07:46	130	5621	↓
443		↓	07:50	60	5688	↓
401		↓	07:52	74	5563	↓
523		↓	07:55	237	5504	↓
42	✓	↓	08:00	60	8005	↓
42B	✓	↓	08:02	60	8431	ASH
402		↓	08:05	60	19488	DN
504		↓	08:08	60	19520	↓
406		↓	08:10	60	5974	↓
512		↓	08:12	991	5504	↓
467		↓	08:30	1200	5592	↓
426		↓	08:51	221	5512	↓
481		↓	08:56	60	7148	↓
473		↓	08:58	60	12719	↓
524		↓	09:00	286	5511	↓
486	✓	↓	09:06	61	16082	↓
486B	✓	↓	09:08	60	15863	CF
493		↓	09:10	127	5521	DN
425		↓	09:13	283	5509	↓
494		↓	09:19	1200	4376	↓
445		↓	09:40	1200	3518	↓

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Review: CJm

Date: 6/17/22

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
518		06/08/22	10:03	732	5781	DN
507			10:17	179	5499	
448			10:22	526	6987	
511			10:32	503	5507	
489			10:41	571	8360	
* 479			10:52	98	5534	↓
D 479B	✓		10:56	91	5138	RP
477			10:59	60	7056	DN
527			11:01	1200	4617	
427			11:27	1200	5091	
75			11:49	155	5513	
502			11:54	158	13265	
452			11:58	1044	6376	
472			12:16	428	7472	
104			12:25	726	5505	
496			12:39	266	5529	
* 418			12:45	114	5519	↓
D 418B	✓		12:48	107	5125	RP
525			12:51	1149	5501	DN
2			13:12	60	8748	
441			13:14	60	7915	
254			13:17	60	19618	
49			13:19	65	5582	
461			13:21	377	5509	
516			13:29	60	8899	
508			13:32	60	5641	
411			13:37	60	8806	
* 430			13:39	71	5620	↓
D 430B	✓		13:41	70	5549	RP

Review: CFarr

Date: 6/17/22

Canister Number	Duplicate Count	Count Date (mm/dd/yy)	Count Time (24:00)	Count Duration (seconds)	Total Counts	Technician Initials
420		06/08/22	13:45	277	5499	DN
509			13:51	247	5502	
495			13:57	226	5523	
200			14:02	528	5506	
480			14:12	313	5504	
429			14:20	149	5508	
469			14:23	450	5508	
526			14:32	60	9542	
21			14:34	60	19067	
* 424			14:37	89	5538	
D 424B	✓		14:40	91	5488	CF
528			14:44	60	7017	DN
529			15:20	153	6730	
312			15:24	60	9445	
409			15:26	523	5505	
410			15:36	60	11243	
417			15:39	350	5502	
503			15:46	104	5641	
414			15:49	60	6727	
487			15:52	862	10106	
* 1			16:08	99	5521	
D 1B	✓		16:10	98	5568	RP
STD1D			16:15	1200	46346	DN
STD3D			16:36	1200	44150	
BKGD			16:57	1200	2660	
ew by BKGE		06/09/22	08:47	1200	2667	CF
STD1E			09:09	1200	45891	DN
STD3E			09:54	1200	44445	
437			10:20	179	6886	

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Review: CF

Date: 6/17/22

$16 = 131$

Date: 6/17/22