Natural Soda LLC

2023 Project Status Report
&
Annual Plan of Development
January 2024

Please note CONFIDENTIAL data sections of this document

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1.0 Introduction and Project Summary

This 2023 Project Status Report and Annual Plan of Development is submitted to fulfill the requirements of BLM sodium leases, COC-00118326, COC-00118327, COC-0119986, and COC-37474 as stated in Federal Regulations 43 CFR, Subpart 3591 and 3592 and the Project Record of Decision dated January 20, 1987. This report is also submitted to the Colorado Division of Reclamation Mining and Safety (DRMS) to meet the requirements for an Annual Report per State permit number M-1983-194, and in part to meet the requirements contained in the EPA UIC Class III Area Permits: CO30358-00000 and CO32169-00000. EPA UIC Permit CO32169-0000 was assigned to the Deep Vertical Production Well (DVPW) project. The NS DVPW program was terminated by NS and NS Plugged and Abandoned (P&A) the DVPW-1 well in 2022. This permit was canceled by the EPA in 2023 at the request of NS. The EPA UIC permit expired on January 20, 2023. Permit C032169-0000 will not appear in future annual reports.

This report summarizes the Natural Soda LLC (NS) 2023 process operations, production activities, reclamation status, geotechnical and environmental monitoring results, as well as the status of surface facilities and wells. Proposed operations for 2024 will be described in this report, including the possibility of permitting two new production wells, 19H-1V and 19H-IR-E. NS will also drill and complete two new production wells, the 18H-1V and the 18H-IR-W well. Groundwater monitor wells (GMWs) and water supply wells (WSWs) will be maintained in 2024.

2.0 Description of Project Area

2.1. Location and Regional Setting

The four NS federal sodium leases are located in the Piceance Creek Basin in Rio Blanco County in northwestern Colorado (Figure 1 and Figure 2). The sodium leases are located primarily between the Yellow Creek and Piceance Creek drainages, approximately 41 miles from Meeker, Colorado and 53 miles from Rifle, Colorado. The climate is semi-arid with annual precipitation averaging 12-14 inches. Precipitation generally occurs as snow from November to March and as rain during the remainder of the year. The vegetation is predominantly pinyon pine, sagebrush, Utah juniper, western wheatgrass, and needle-and-thread grass. The total area contained within the four sodium leases is 8,379 acres more or less. The principal area of current operations are located in and around Section 26, T1S, R98W, 6th Principal Meridian. Figure 1 shows the NS leases and regional setting. Figure 2 shows sodium leases within the Piceance Creek Basin. Figure 3 and Figure 4 show the NS well locations and proposed well locations.

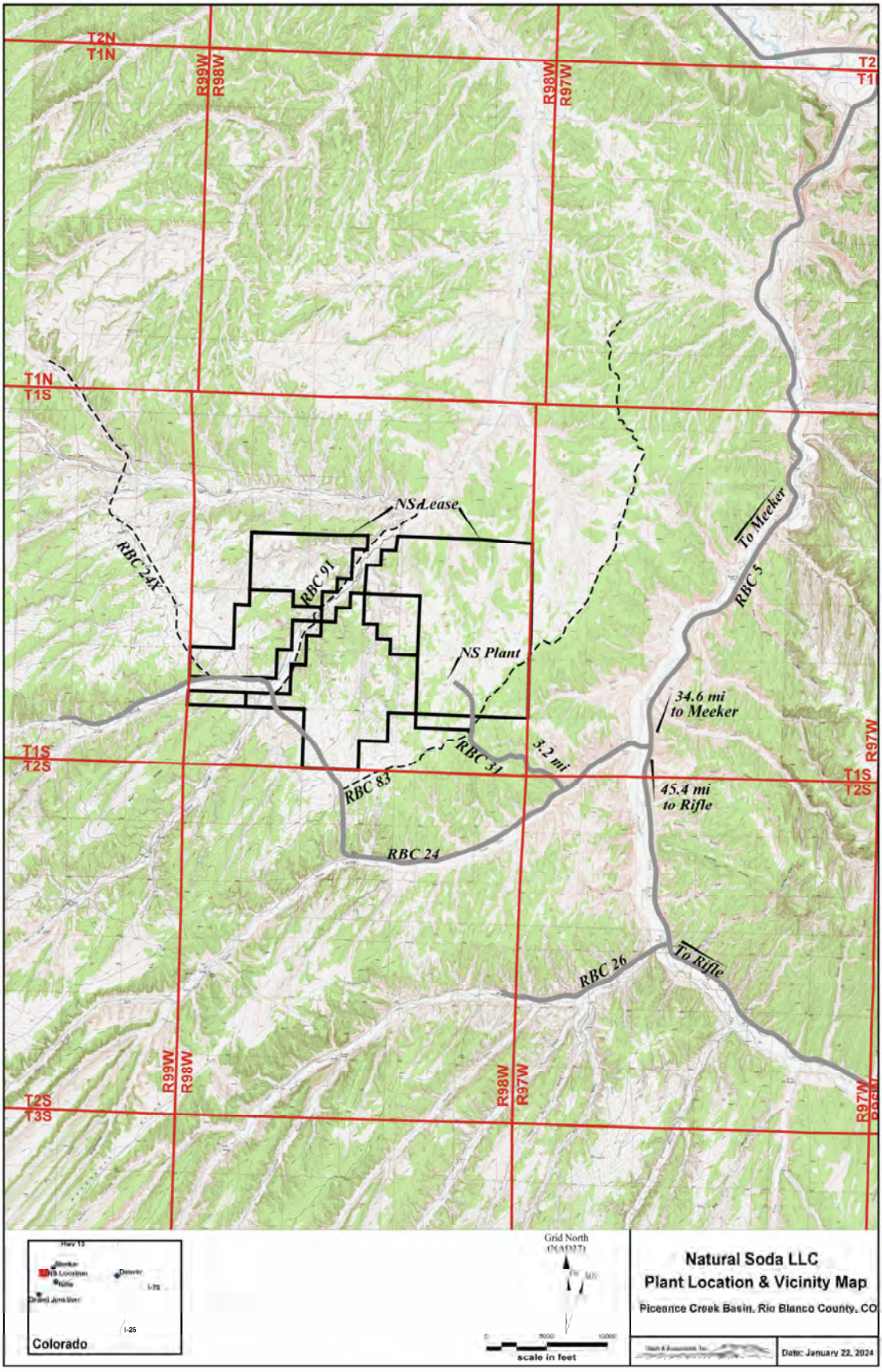


Figure 1: Natural Soda LLC Vicinity Map

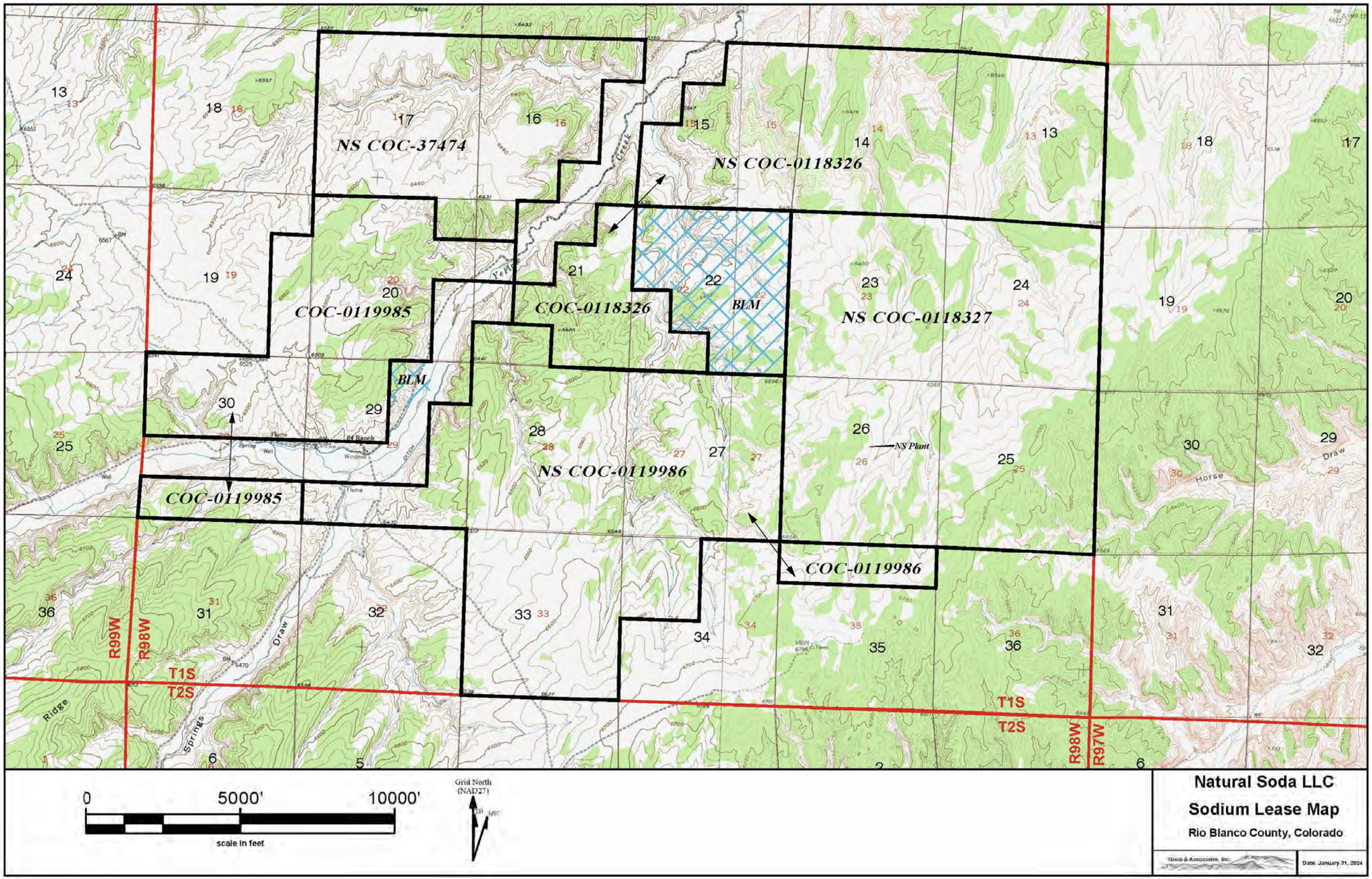


Figure 2: NS Sodium Leases Map

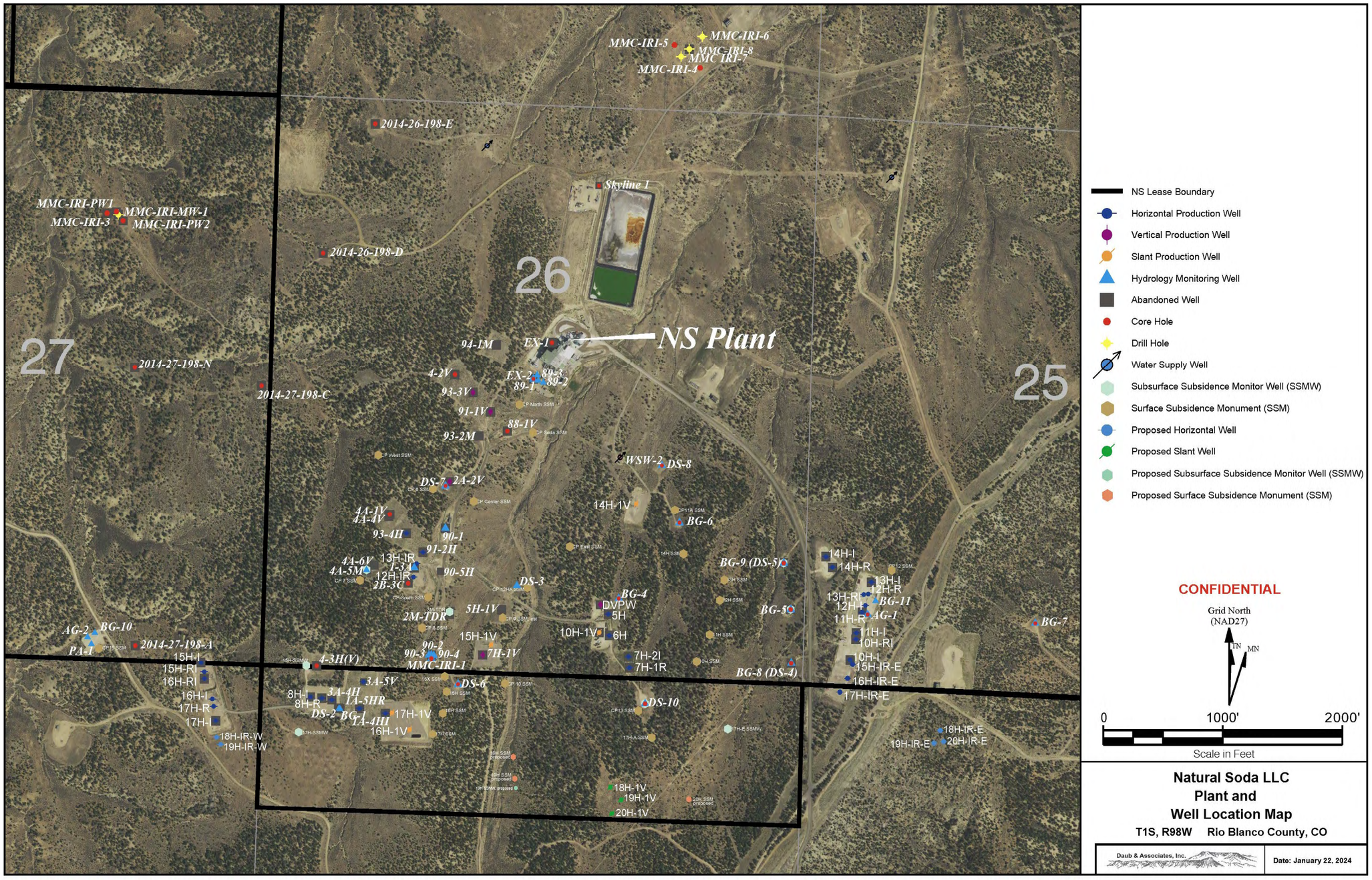


Figure 3: NS Plant and Well Location Map, Section 26 Detail.

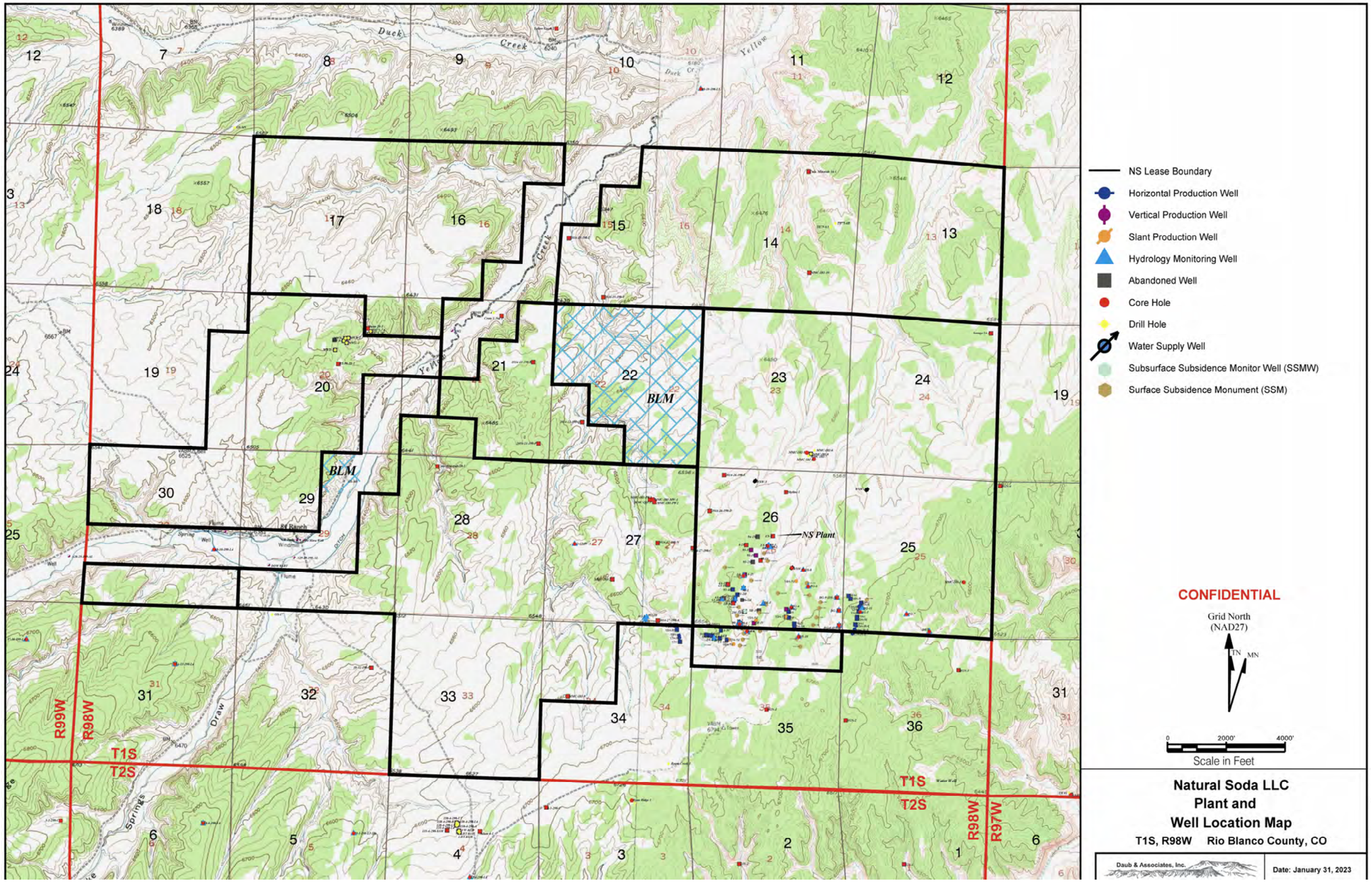


Figure 4: NS Plant and Well Location Map, Expanded View

2.2. Leasehold Status

The original four NS sodium leases were renewed by the BLM in 2021 for a period of ten years. Annual rental and royalty payments have been submitted to the Mineral Management Service. The NS leases comprise approximately 8,379 acres. NS plans to renew the leases again in 2031 for an additional period of ten years.

3.0 Project Status

3.1. 2023 Project Activities (Confidential)

(See Figure 3 & Table 4: Plant and Well Location Maps)

In 2023 NS produced 250,297 tons of sodium bicarbonate, and generated 249,916 tons in annual sales. Table 1 presents the monthly sodium bicarbonate production, sales, and inventory summary for 2023. This product was produced from the 12H, 13H, 15H, 16H, and 17H mining intervals. The 2023 and lifetime sodium bicarbonate production for the mining intervals is presented in Table 2. Routine boil outs were performed in 2023. NS completed a capital project to install a cyclone on the #3 dryer which is the product dryer in Train #2. The installation was completed in April 2023. NS is planning additional capital expenditures to upgrade equipment over the next few years. Various short shutdowns were required for routine maintenance, equipment repair, and/or replacement throughout the year.

3.1.1. Items of Significance (Confidential)

- A 3-acre well pad was constructed for the proposed 18H-1V/19H-1V/20H-1V slant production wells. To access this pad from the plant, a 1,600 foot access road was built and graveled. A new pipeline was constructed proximal to the access road to connect the proposed 18H-1V production well with existing pipeline infrastructure. The existing 15H-17H (west) pad was extended toward the south; this 2-acre pad extension will be utilized for the proposed 18H-IR-W and 19H-IR-W wells.
- Plug & Abandonment (P&A) operations occurred during 2023 to remove older wells from the NS groundwater monitoring program. These wells, associated with the Rock School Lease: AM-2, MWA-2, MWB-2, MWD-1, MWD-2, MWU-2, and the RS-96-20-1 were all P&A'ed in 2023.
- NS P&A'ed three inactive sodium bicarbonate production wells in 2023: 14H-R(I), 15H-I, and the 17H-I.

3.1.2. 2023 Monthly Bicarbonate Summary (Confidential)

Table 1: Monthly Production, Sales, and Inventory Summary in Tons (Confidential)

Month	Beginning Inventory	Production	Sales	Ending Inventory
January	5,574	21,808	22,950	4,433
February	4,433	18,960	19,284	4,108
March	4,108	21,248	21,850	3,437
April	3,437	20,141	19,448	4,130
May	4,130	21,720	21,106	4,744
June	4,744	19,716	19,463	5,004
July	5,004	23,072	22,272	5,805
August	5,805	20,040	20,209	5,636
September	5,636	20,875	20,864	5,677
October	5,677	20,838	22,129	4,385
November	4,385	21,263	20,426	5,221
December	5,221	20,616	19,915	5,902
TOTALS		250,297	249,916	

3.1.3. Mining Interval Bicarbonate Production (Confidential)

Table 2: Mining Interval Annual and Lifetime Production (Confidential)

Tons Mined in 2023	Mining Interval 12H	Mining Interval 13H	Mining Interval 15H	Mining Interval 16H	Mining Interval 17H
	31,945	16,906	64,027	71,102	66,318
Total Production (Tons) as of Dec 31, 2023	352,415	262,199	404,507	336,538	219,691

3.1.4. Regulatory Review (Confidential)

NS submitted routine Sundry Notices, monthly, quarterly, and annual reports to the appropriate agencies. The following summarizes other regulatory related activities:

Bureau of Land Management (BLM)

- In February 2023 NS submitted an application for an off-lease access road for the 15H-17H well pad extension for the proposed 18H-IR-W well and the 18H-1V well pads crossing public lands in T1S, R98W. The BLM approved the amendment to the existing Right Of Way (ROW) # COC-77816 on July 11, 2023.
- NS contracted with Grand River Institute (GRI) in April 2023 to conduct a Class III cultural resource inventory for the proposed 18H-1V access road and pipeline per BLM requirements in May of 2023. GRI conducted the survey over 4 days and submitted the final report to BLM Archaeologist, May 15, 2023. BLM reviewed the survey and had no objection with the construction of the proposed access road and pipeline.
- NS contracted D&A to perform a raptor survey for the proposed 2023/2024 drilling and completion operations areas. The raptor survey was conducted May 15 and 16, 2023 with no noted problems or concerns. The report was submitted to the BLM on May 23, 2023.
- The BLM approved the applications for drilling the 18H-1V and 18H-IR-W wells on June 3, 2023 and also sent NS the Conditions of Approval (COA's). NS submitted the applications in November of 2022.
- NS submitted Well Sundry Notices for the P&A of the seven Rock School Lease groundwater monitoring wells (AM-2, MWD-1, MWU-2, MWA-2, MWB-2, MWD-2, and RS-96-20-1). On September 15, 2023. BLM 3160-5 forms and well P&A diagrams for each well were submitted to the BLM.
- October 5, 2023 NS submitted Well Sundry Notices for the P&A of the 14H-R(I), 15H-I, and 17H-I production wells with required BLM 3160-5 forms and diagrams.
- November 7, 2023 the BLM granted NS an exception to the timing limitation in the 18H-1V and 18H-IR-W COA's, authorizing a May 1, 2024 commencement of drilling operations.

United States Environmental Protection Agency (EPA)

- January 12, 2023 NS sent EPA a request for the release of the DVPW-1 (EPA # C032169-08754) bond monies ($63,140) and termination of the DVPW UIC permit following the successful P&A of the DVPW-1 injection well in September of 2022. The DVPW-1 was the only well on EPA permit C032169-00000. EPA agreed with NS request for removal and sent a notification letter on January 24, 2023.
- NS coordinated with the EPA during the first half of 2023 to modify NS's subsurface subsidence monitoring well (SSMW) requirements.
- February 2023 NS coordinated with the EPA with regards to the confidentiality of NS's EPA quarterly report data. NS modified EPA reporting for 2023 to comply with agreed upon confidentiality requirements.
- April 6, 2023 the EPA approved the 18H-IR-W UIC well permit (#C030358-12525) and authorized construction.
- NS submitted EPA P&A reports for the 14H-R(I), 15H-I, and 17H-I injection wells (EPA# CO30358-11614, 11004, and 11006 respectively) on October 4, 2023. EPA subsequently notified NS that the subject wells were removed from the area permit C030358-0000 October 24, 2023.

Colorado Division of Reclamation, Mining and Safety (DRMS)

- NS submitted annual reports and fees for DRMS Permits M 1983-194 and M-1999-051 in January 2023.
- January 27, 2023 NS submitted a request for Technical Revision (TR) 50 to drill and complete the 18H-1V and 18H-IR-W production wells, construct well pads, access road, and pipeline; TR-50 was approved on February 14, 2023. TR-50 approval increased NS financial responsibility to $4,466,425. NS put in place appropriate financial warranty which was accepted by the DRMS on April 11, 2023.
- DRMS conducted an onsite 1st quarter inspection on April 3, 2023. DRMS observed the process buildings and internal plant equipment. During the inspection DRMS noted that the crystal habit modifier, defoamer, and oxygen scavenger chemicals Material Safety Data Sheets (MSDS) were not on file with the division, and requested they be filed no later than June 16. DRMS received and acknowledged the requested MSDS from NS on April 26. No additional problems or violations were noted during this inspection.

- June 5, 2023, DRMS conducted an onsite 2nd quarter inspection focused on the reclamation success of recently reclaimed areas. Pad 8H, 93-4H, 91-2H, BG-9, BG-5 and DS-4 were visited and observed. DRMS made recommendations on weed abatement and reseeding for some locations. No problems or violations were noted during this inspection.
- DRMS inspected the M-1999-051 Rock School Lease on June 5, 2023 prior to the P&A of the seven monitor wells associated with the permit. Wells, vegetation, and reclamation efforts were observed. No problems or violations were noted during this inspection.
- DRMS conducted an onsite 3rd quarter inspection on August 28, 2023 to inspect the stormwater management and the 18H newly constructed pads and access roads. DRMS observed trash and sedimentation surrounding the plant area and affecting the functionality of stormwater drainage. DRMS requested trash, ditches, and berms surrounding the plant to be cleaned and modified to alleviate the drainage issues by October 31, 2023. NS conducted the requested corrective actions and submitted documentation to DRMS on October 27, 2023. The DRMS was satisfied with the corrective actions. No additional problems or violations were noted during the inspection.
- On November 30, 2023 DRMS conducted the 4th quarter onsite inspection of the NS operation. This site visit was to observe the Secondary Containments located within the plant. DRMS observed many chemicals throughout the plant inspection they did not have a record of and requested NS to provide all MSDS to DRMS for said chemicals by February 16, 2024. On December 18, 2023 DRMS acknowledged the receipt of seven MSDS sheets and was satisfied that no additional action was necessary. No additional problems or violations were noted during this inspection.

Colorado Division of Water Resources (DWR)

- A senior water right holder placed a call on the White River effective December 1, 2022. NS initiated its surface water augmentation plan (88CW420) on December 19,' 2022. NS periodically released water during 2023 from the WSW-3 and WSW-4 to meet obligations for White River surface runoff requirements. NS released 1,241,300 gallons in 2023.
- NS notified DWR of the P&A completion for the AM-2, MWA-2, MWB-2, MWD-1, MWD-2, and MWU-2 Rock School Lease groundwater monitoring wells on September 18, 2023.

Colorado Department of Public Health & Environment (CDPHE)

- CDPHE inspection personnel conducted a full compliance inspection of NS operations on February 7, 2023. No visible emissions were observed during inspection, no off property transport of visible emissions were observed, and no odors were noted. Construction Permits were reviewed with no noted concerns. Current Air Permit Emission Notices (APENs) were reviewed and found to be in compliance. The CDPHE inspection found NS to be in compliance.
- On February 22, 2023, NS submitted the COG-500000 Annual Stormwater Report to the CDPHE.
- NS submitted annual water sampling data for water supply wells (WSWs) to the CDPHE in the 4th quarter 2023. The WSW-2 tested positive for coliform. This issue was corrected by NS with the addition of 55 gallons of sodium hypochlorite and 4,400 gallons of 1% sodium hypochlorite to WSW-2 over the course of a day, the well was allowed to sit overnight. The following day the well pump was started, the treated water was pumped into the NS water truck, and periodically tested until uS, pH, ORP, free chlorine and total sulfide returned to normal ranges. NS continued flushing the well for an additional day and submitted another sample to CDPHE which tested negative for coliform and e coli. Treatment was completed on December 5th, and the treated fluid was disposed of properly into the NS waste pond.
- NS submitted a Facility-Wide Greenhouse Gas Emissions (GHG) APEN (AIRS ID # 103/0028/002) and fee on December 20, 2023.

Rio Blanco County (RBC)

- RBC did not require amendments to the existing Special Use Permit (SUP) 12-04 for the 2023 P&A operations.
- A RBC building permit for the 2023 Train 2 Cyclone Installation Project was acquired by NS in September 2022.
- In June, NS submitted and was approved for a SUP permitting the construction of the 18H-1V well pad, pipeline, and access road.

3.2. Proposed 2024 Activities and Schedule (Confidential)

3.2.1. Processing (Confidential)

NS anticipates sodium bicarbonate production of approximately 250,000 tons in 2024. Brief, routine shut-downs for periodic boil-outs and maintenance activities will occur as necessary.

3.2.2. Well field (Confidential)

- NS plans on drilling two new production wells to establish the western portion of the 18H mining interval during the spring/summer of 2024. These wells have been permitted and approved by all agencies. The 18H-1V slant production well will be drilled first. The 18H-IR-W production well will then be drilled to intercept the 18H-1V within the desired Boise Bed target zone.
- NS may continue the permitting process, during 2024, for two new production wells, the proposed 19H-1V slant production well to be drilled as the first well of the 19H mining interval and the proposed 19H-IR-E production well to be drilled east of 19H-1V. The 19H-IR-E will intersect the 19H-1V well, forming the eastern portion of a new 19H mining interval.

3.2.3. EPA Notification – Schedule of Planned Mechanical Integrity Test (MIT) (Confidential)

- Per EPA UIC Permit C030358-00000 requirements, the following routine injection well (initial, 5-year, or 10-year) MIT Part 1 pressure testing and MIT Part 2 temperature logging is planned for 2024 or the first quarter of 2025.
  - o 15H-IR-E (5-year): MIT P1 and P2 testing/logging is planned to occur during the fourth quarter 2024 and/or the first quarter of 2025.
  - o 18H-IR-W MIT P1 (initial) will be conducted, as appropriate, during well construction in 2024.
  - o 18H-IR-W MIT P2 baseline temp log will be run, as appropriate, during well construction. MIT P2 initial logs are required 60-90 days post EPA ATI.

3.2.4. EPA Notification – Schedule of Planned SSM Survey (Confidential)

- NS conducted the biennial surface subsidence monument survey in 2023 and the results are reported in section 4.4.2 of this report. The next biennial surface subsidence monument survey will occur in 2025 in accordance with UIC Permit C030358-00000 requirements.

3.2.5. EPA Notification – Schedule of Planned SSMW Logging (GR/CCL) (Confidential)

- Per EPA UIC Permit C030358-00000 requirements; routine subsurface subsidence monitor well (SSMW) logging (GR/CCL) is planned for 2024 or the first quarter of 2025:
  - NS logged the DS-3 well on January 9, 2024 to collect SSMW CCL/GR logs. The DS-3 monitor well serves as a GMW and SSMW for the 12H and 13H mining intervals. Comparison of 2002, 2011 and 2024 CCL/GR logs indicated no subsurface subsidence in the DS-3 well.
  - Per UIC Permit, SSMW logging is determined based on mining interval production, NS will notify the EPA of upcoming SSMW logging as production milestones become more clear.

4.0 2023 Project Activities

4.1. On-Site Facilities and Process Description

4.1.1. General Arrangement

(Figure 5 provides an overview of the NS process flow.)

4.1.2. Lab Operation / Sanitation / ISO

In 2023, activities continued in the NS laboratory to provide analysis for process control, quality assurance, and regulatory requirements.

- Plant operators performed process control analyses.
- Chloride levels were monitored by both operations and laboratory personnel on USP grades to ensure USP standards were met.
- The USP test for insoluble materials was conducted on a per lot basis by laboratory personnel and a filter test for insoluble materials was conducted on the dry product once per shift by NS operators.
- Pests were controlled with the use of two UV bug lights and rodent traps around the interior and exterior walls of the plant. Bait stations replaced external traps at the Rifle warehouse.
- GMP/ISO/Sanitation training was provided for employees as required.
- A food safety audit for FSSC 22000 was conducted for which NS maintained GFSI certification.
- CDPHE, NSF, OMRI, Kosher, Halal, Non-GMO, CleanGredients and ISO 9001 certifications were properly maintained.

4.1.3. Process, Utilities, Facilities

- The NS Train 2 Dryer system did not have a Cyclone; a capital project was undertaken in 2023 to add a Cyclone to the system. Work on the Cyclone installation project began during January 2023; on April 10th dryer cyclone #3 installation final processes commenced and were completed and operational on April 14, 2023.
- June 18 – 23, the NS plant underwent the yearly common outage, where all production wells were shutdown. NS boiled out both production trains and completed annual maintenance and inspections on Common systems (electrical switchgear, cooling tower, wellfield pipelines, etc.).
- The NS Packaging Department shutdown on July 13th while the upgraded personnel protection tripping circuit, trip switches, trip wires, roller guides and guide loops on double/triple baggers, incline conveyor, and palletizer were installed and made operational.

- On July 25th, 2023 a leak was discovered in 16H-I(R) piping. NS diverted all injection flow to 16H-IR-E and repaired the line, once completed all flow was returned to the preexisting operational condition.

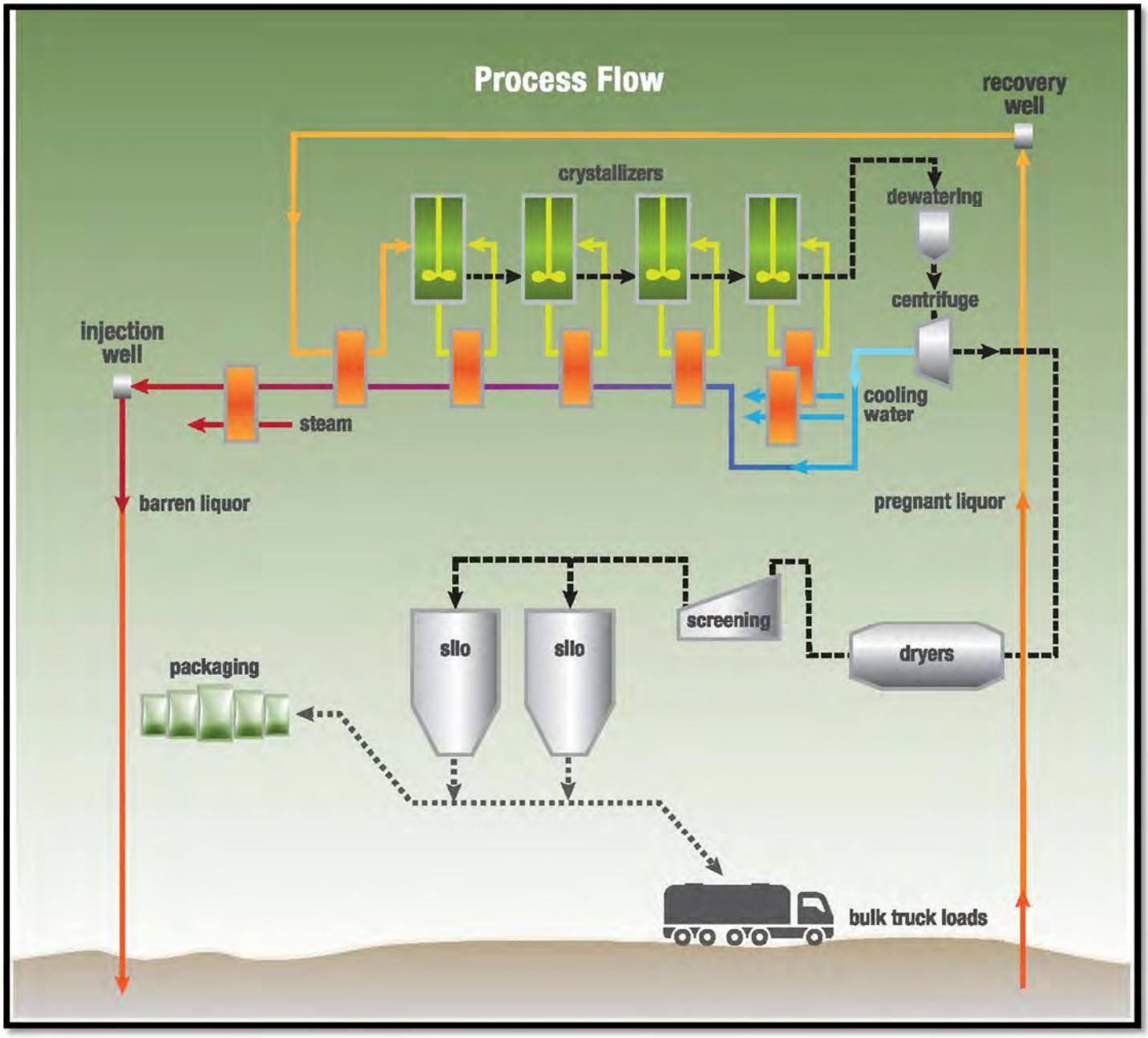


Figure 5: General Flow Process

4.1.4. Wells Associated with the NS Project (Confidential)

The following well-field related activities occurred in 2023: Refer ***Figure 3 &*** Figure 4 ***Plant and Well Location Map***.

- NS began the Rock School Lease P&A project on May 10, 2023 with video log inspections of the 7 wells involved in the project. May 25 through 26, 2023, Himes Drilling Company (Himes) mobilized a pulling unit to the location and began removing various equipment from the wells. On June 18, 2023, Himes rigged up their drilling rig over the first well and began operations.
    - MWA-2 Well P&A began June 19 and was completed July 13.
    - MWB-2 Well P&A started June 19 and was completed July 6.
    - MWU-2 Well P&A began June 22 and was completed June 22.
    - AM-2 Well P&A was started and completed on July 17.
    - MWD-2 Well P&A began July 17 and was completed July 18.
    - MWD-1 Well P&A started July 20 and was completed July 21.
    - RS-96-20-1 P&A began July 21 and was completed July 24.
    - On July 24, 2023 Himes completed the Rock School Lease P&A project. All 7 wells involved in this project will have their casing cut off below ground level, a casing cap and identification placard will be welded onto the casing. The wells will all be buried at the same time when the well pads undergo reclamation work in spring or summer of 2024.
- During July and August 2023 NS built a new 3 acre well pad "18H-1V" near the southern portion of the lease where the proposed 18H, 19H, and 20H-1V slant production wells will be drilled and completed. The dirt work and gravel operations were completed by Moody Services.
- A new 1,600 foot 18H-1V access road was built by Moody services in July and August 2023 to connect the new 18H-1V location to an existing access road to the north of the pad.
- A new pipeline was constructed in fall of 2023 on the 18H-1V access road that will connect the existing pipeline infrastructure to the new feed from the proposed 18H/19H/20H-1V wells.
- A 2 acre southern extension of the existing 15H-17H West location was built and graveled in July and August 2023. The proposed 18H-IR-W and 19H-IR-W production wells will be drilled and completed on this location.
- NS conducted discrete zone water sampling of the DS-3, DS-6, DS-7 and DS-10 wells for annual water quality analysis on June 20, 2023.
- P&A operations occurred on the 17H-I production well between August 7 through the August 11, 2023. The casing was cut below ground level and a final P&A marker was installed in October, 2023.

- P&A operations occurred on the 15H-I production well between August 11 through the August 18, 2023. The casing was cut below ground level and a final P&A marker was installed in October, 2023.
- P&A operations occurred on the 14H-R(I) production well between August 16 through the August 29, 2023. The casing was cut below ground level and a final P&A marker was installed in September, 2023.

The current status of wells associated with the NS Project is presented in Table 3: *List and Status of Wells Associated with NS.*

4.1.5. Other Activities

Continuous water level monitoring of proximal DS aquifer monitor wells, using fluid level indicators (pressure transducers), provided real time data for the management of active production mining interval operations. Throughout 2023, injection and recovery rates were adjusted to maintain water levels of these monitoring wells near target zones.

Table 3: List and Status of Wells Associated with NS (Confidential)

Well Name	Initial Well Type	Current Well Status	Section	Town-ship	Range	Latitude (NAD 27)	Longitude (NAD 27)	Initial TD, (MD, ft)	Current TD, (MD, ft)	Comments
12H-I	Horizontal-Injection	Horizontal-Production	25	1S	98W	39.929304000	108.348621000	4189.0	4189	TVD TD=~1985’
12H-R	Horizontal-Recovery	Horizontal-Recovery	25	1S	98W	39.929598000	108.348538000	2623.0	2623	TVD TD=~2007'
12H-IR	Horizontal-Production (Inj/Rec)	Horizontal-Production	26	1S	98W	39.929667896	108.363801054	3464.7	3464.7	TVD TD=-1972’
13H-R(I)	Horizontal-Production (Inj/Rec)	Horizontal-Production	25	1S	98W	39.929583170	108.348684400	2549	2549	TVD TD=~2013’
13H-IR	Horizontal-Production (Inj/Rec)	Horizontal-Production	26	1S	98W	39.930014690	108.363712457	3423.7	3423.7	TVD TD=-1964’
14H-1V	Slant Production (Rec)	Subsurface Subsidence Monitoring)	26	1S	98W	39.931733549	108.35641781	2095.5	2095.5	
15H-R(I)	Horizontal Production (Inj/Rec)	Horizontal-Production	34	1S	98W	39.927050806	108.370714984	2698	2698	TVD TD=~1850’
15H-1V	Slant Production (Rec)	Slant Production (Rec)	26	1S	98W	39.92797980	108.36112812	2079.1	2079.1	TVD TD=~1922’
15H-IR-E	Horizontal Production (Inj/Rec)	Horizontal Production	25	1S	98W	39.92778393	108.34898748	4032.4	4032.4	TVD TD=~1960’
15H-SSMW	Subsurface Subsidence Monitoring	Subsurface Subsidence Monitoring	26	1S	98W	39.927297800	108.367304200	1760.5	1760.5	
16H-I	Horizontal Injection	Horizontal-Injection	34	1S	98W	39.926332533	108.371061443	5425	5425	TVD TD=~1910’
16H-1V	Slant Production (Rec)	Slant Production (Rec)	35	1S	98W	39.925742470	108.363769248	2086	2086	TVD TD= ~1945’
16H-IR-E	Horizontal Production (Inj/Rec)	Horizontal Production	25	1S	98W	39.927419470	108.349138051	4025	4011	TVD TD= ~1959’
17H-1V	Slant Production (Rec)	Slant Production (Rec)	35	1S	98W	2376.7	2376.7	2376.7	2376.7	TVD TD= ~1961’
17H-IR-E	Horizontal-Production (Inj/Rec)	Horizontal-Production (Inj/Rec)	36	1S	98W	39.9270577	108.349382	3994.7	3994.7	TVD TD=-1965’
17H-R(I)	Horizontal-Recovery	Horizontal-Recovery	34	1S	98W	39.926171184	108.370365216	2431.7	2431.7	TVD TD=-1872’
17H-E SSMW	Subsurface Subsidence Monitoring	Subsurface Subsidence Monitoring	35	1S	98W	39.92601271	108.3531506	1828	1828	
17H-SSMW	Subsurface Subsidence Monitoring	Subsurface Subsidence Monitoring	35	1S	98W	39.925620961	108.367424479	1731.0	1720.6	
89-1	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.934818008	108.359830288	1989	1570	
89-2	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.934771572	108.359655360	1409	1389	
89-3	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.934959857	108.359876003	400	390	Periodic sampling issues
WSW-2 (2010-26-198-2C)	Core Hole	Water Supply	26	1S	98W	39.932913043	108.357000636	1964	1402	Cored July 2010
WSW-3	Water Supply	Water Supply	26	1S	98W	39.940837450	108.361799400	1440	1440	Drilled August 2014
WSW-4	Water Supply	Water Supply	26	1S	98W	39.940358200	108.348198508	1437	1437	Drilled August 2014
90-3	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.927659529	108.363196386	1577	1556	
90-4	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.927654857	108.363040763	1392	1371	Cleaned out to TD August 2021
AG-1	Core Hole 2014-25-198-J	Hydrology Monitoring Well	25	1S	98W	39.929116963	108.348465043	2061	1487	Cemented up to groundwater monitoring well level

Table 3: List and Status of Wells Associated with NS (continued) (Confidential)

Well Name	Initial Well Type	Current Well Status	Section	Town-ship	Range	Latitude (NAD 27)	Longitude (NAD 27)	Initial TD, (MD, ft)	Current TD, (MD, ft)	Comments
AG-2	Hydrology Monitoring	Hydrology Monitoring Well	27	1S	98W	39.927814	108.375312	1275	1275	Drilled & Completed August 2021
BG-4	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.929278506	108.356901248	1999.5	1603	
BG-6 (2010-26-198-6C)	Core Hole	Hydrology Subsidence Monitoring Well	26	1S	98W	39.931301816	108.354997679	1978	1577	
BG-7	Core Hole 2014-25-198-K	Hydrology Monitoring Well	25	1S	98W	39.928987896	108.432905289	1967	1593.1	Cemented up to groundwater monitoring well level
BG-10	Hydrology Monitoring	Hydrology Monitoring Well	27	1S	98W	39.927930	108.375072	1461	1461	Drilled & Completed August 2021
BG-11	Hydrology Monitoring	Hydrology Monitoring Well	25	1S	98W	39.929399	108.348929	1685.5	1685.5	Drilled & Completed February 2021
DS-3	Hydrology Monitoring	Hydrology Monitoring Well	26	1S	98W	39.929529067	108.360329121	2100	1874.5	Sample pump replaced with NLP in 2018
DS-6	Core Hole	Hydrology Monitoring Well	35	1S	98W	39.926942000	108.362195000	2962.6	1870	Cemented up to groundwater monitoring well level
DS-7	Core Hole	Hydrology Subsidence Monitoring Well	26	1S	98W	39.932036903	108.362826421	1980	1875	Cemented up to groundwater monitoring well level
DS-8	Core Hole 2014-26-198-I	Hydrology Monitoring Well	26	1S	98W	39.932738295	108.355594975	2000	1881.7	Cemented up to groundwater monitoring well level
DS-9	Core Hole 2014-25-198-M	Hydrology Monitoring Well	25	1S	98W	39.927447860	108.340064803	1916.5	1842	Cemented up to groundwater monitoring well level
DS-10	Hydrology Subsidence Monitoring Well	Hydrology Subsidence Monitoring Well	35	1S	98W	39.92659671	108.35590409	1995	1925	
MMC-IRI-1	Core Hole	Hydrology Monitoring Well	26	1S	98W	39.927580161	108.363115621	2981	397	Cemented up to groundwater monitoring well level
MMC-IRI-4	Core Hole	Hydrology Monitoring Well	23	1S	98W	39.942950000	108.355333333	3001	1411	Cemented up to groundwater monitoring well level
MMC-IRI-5	Hydrology Monitoring	Hydrology Monitoring Well	23	1S	98W	39.943578031	108.355623039	2983	378	
MMC-IRI-6	Hydrology Monitoring	Hydrology Monitoring Well	23	1S	98W	39.943733333	108.355316667	1878	1394	
MMC-IRI-7	Hydrology Monitoring	Hydrology Monitoring Well	23	1S	98W	39.943516667	108.356033333	1880	1395	
MMC-IRI-11	Core Hole	Hydrology Monitoring Well	25	1S	98W	39.931608050	108.336010982	2963	1550	Cemented up to groundwater monitoring well level
O-GMW-A	Core Hole 2014-27-198-O	Hydrology Monitoring Well (Inactive)	27	1S	98W	39.934483259	108.383446479	1786	1294	Cemented up to groundwater monitoring well level
PA-1	Hydrology Monitoring	Hydrology Monitoring Well	27	1S	98W	39.927639	108.375175	435	435	Drilled & Completed August 2021
TH75-6A	Hydrology Monitoring	Hydrology Monitoring Well	14	1S	98W	39.964492958	108.353578053	1260	1260	USGS Well
TH75-6B	Hydrology Monitoring	Hydrology Monitoring Well	14	1S	98W	39.964807700	108.353045189	1755	1755	USGS Well
TH75-11A	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.952321958	108.409207410	1080	1080	USGS Well
TH75-11B	Hydrology Monitoring	Hydrology Monitoring Well	20	1S	98W	39.953286260	108.409494700	1498	1498	USGS Well

4.2. New Findings or Developments (Confidential)

- One new 3 acre well pad and 1,600 foot access road were constructed for the proposed 18H-1V slant production well. A new pipeline was fabricated proximal to the access road to connect the 18H-1V to plant operations. An existing pad, 15H-17H West was extended to the South by 2 acres for the proposed 18H-IR-W well.
- NS P&A'ed the GMW wells associated with the Rock School Lease; AM-2, MWA-2, MWB-2, MWD-1, MWD-2, MWU-2 and the RS-96-20-1.
- NS P&A'ed three production wells; 14H-R(I), 15H-I, and the 17H-I.
- In 2023 NS began sampling DS Aquifer GMWs that do not have nitrogen lift pumps by utilizing a wireline deployed discrete zone sampling tool.

4.3. 2023 Operation Results (Confidential)

Mining and production activities were continuous in 2023. The following Table 4 provides a summary of mining and process results:

Table 4: Mine and Process Data (Confidential)

2023	Recovery	Recovery	Assay	Assay	Tons	Tons	Tons	Tons	Tons	Monthly
Month	*Avg GPM*	*Temp.*	*Bicarb g/l*	*NaCl g/l*	*Mining Interval #12H*	*Mining Interval #13H*	*Mining Interval #15H*	*Mining Interval #16H*	*Mining Interval #17H*	*Total Tons*
Jan-2023	1,908	185	202	15	3,462	1,321	5,229	6,001	5,794	21,808
Feb-2023	1,846	182	199	16	1,020	3,224	4,713	4,848	5,156	18,960
Mar-2023	1,933	181	196	17	4,308	2,451	4,680	4,306	5,503	21,248
Apr-2023	1,866	184	199	16	2,140	1,573	5,475	5,084	5,870	20,141
May-2023	1,912	184	200	16	2,269	1,537	5,690	6,101	6,124	21,720
Jun-2023	1,883	183	201	15	3,038	672	5,272	5,600	5,133	19,716
Jul-2023	2,045	161	198	16	2,184	1,863	5,968	6,817	6,240	23,072
Aug-2023	1,862	180	198	15	2,990	796	4,601	5,662	5,992	20,040
Sep-2023	2,019	181	198	15	3,356	365	5,743	5,934	5,477	20,875
Oct-2023	1,994	181	197	14	3,357	443	5,282	6,688	5,068	20,838
Nov-2023	2,048	185	200	15	3,495	0	5,779	7,057	4,932	21,263
Dec-2023	1,883	181	200	14	325	2,661	5,596	7,003	5,031	20,616
AVERAGE	1,933	181	199	15	2,662	1,409	5,336	5,925	5,527	20,858
TOTAL					*31,945*	*16,906*	*64,027*	*71,102*	*66,318*	*250,297*

Key to above headings:	
	Recovery - Monthly average house flow rate and pregnant liquor temperature during process operations.
	Assay - g/L sodium bicarbonate (as total bicarbonate) and sodium chloride in the pregnant liquor.
	(Total bicarbonate = bicarbonate g/L + 1.58 x carbonate g/L)
	Tons - Total monthly bicarbonate production from each mining interval.
	Temp. - Temperature in degrees F recovered at the pregnant liquor tank.
	Avg GPM - Monthly average injection flow rate during process operations.

Figure 6 illustrates 2023 pregnant liquor analytical results along with monthly averages of sodium bicarbonate production (tons/day). Figure 7 represents monthly and cumulative annual production for 2023. NS produced and processed their sodium bicarbonate product throughout 2023.

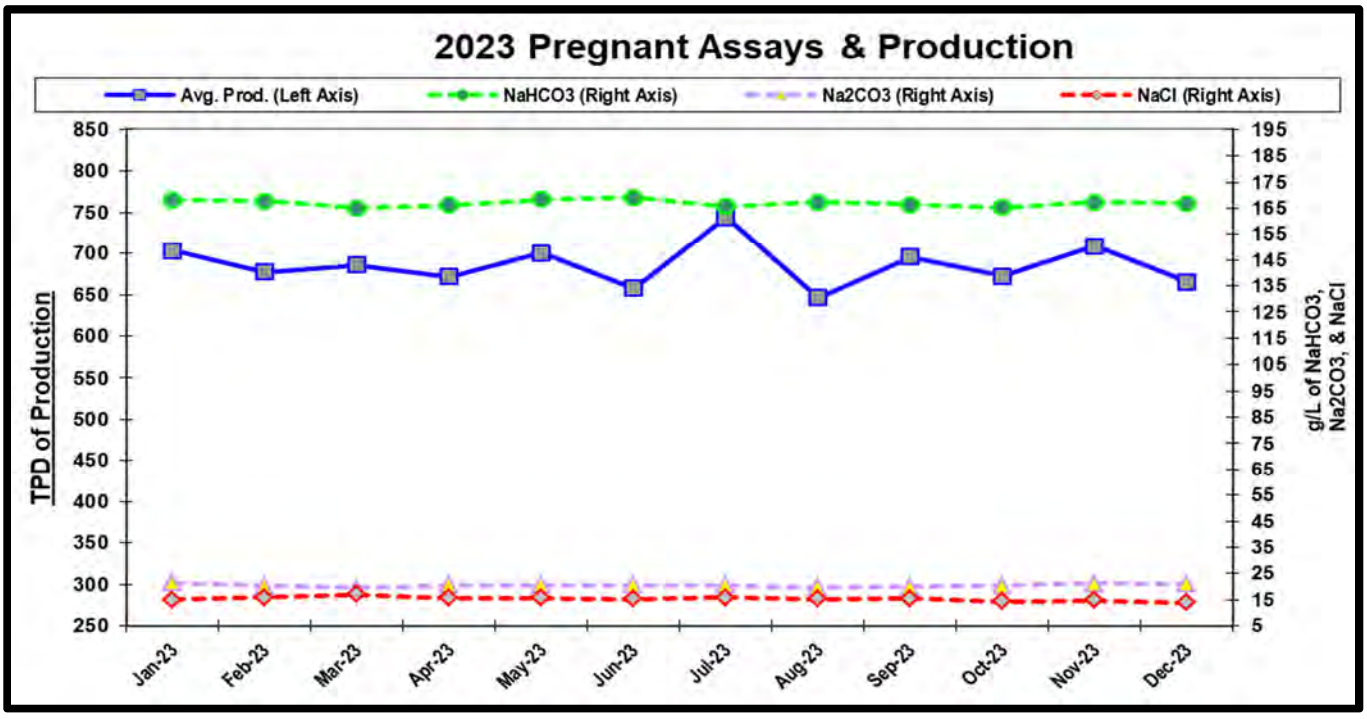


Figure 6: NS 2023 Pregnant Assays and Production (Confidential)

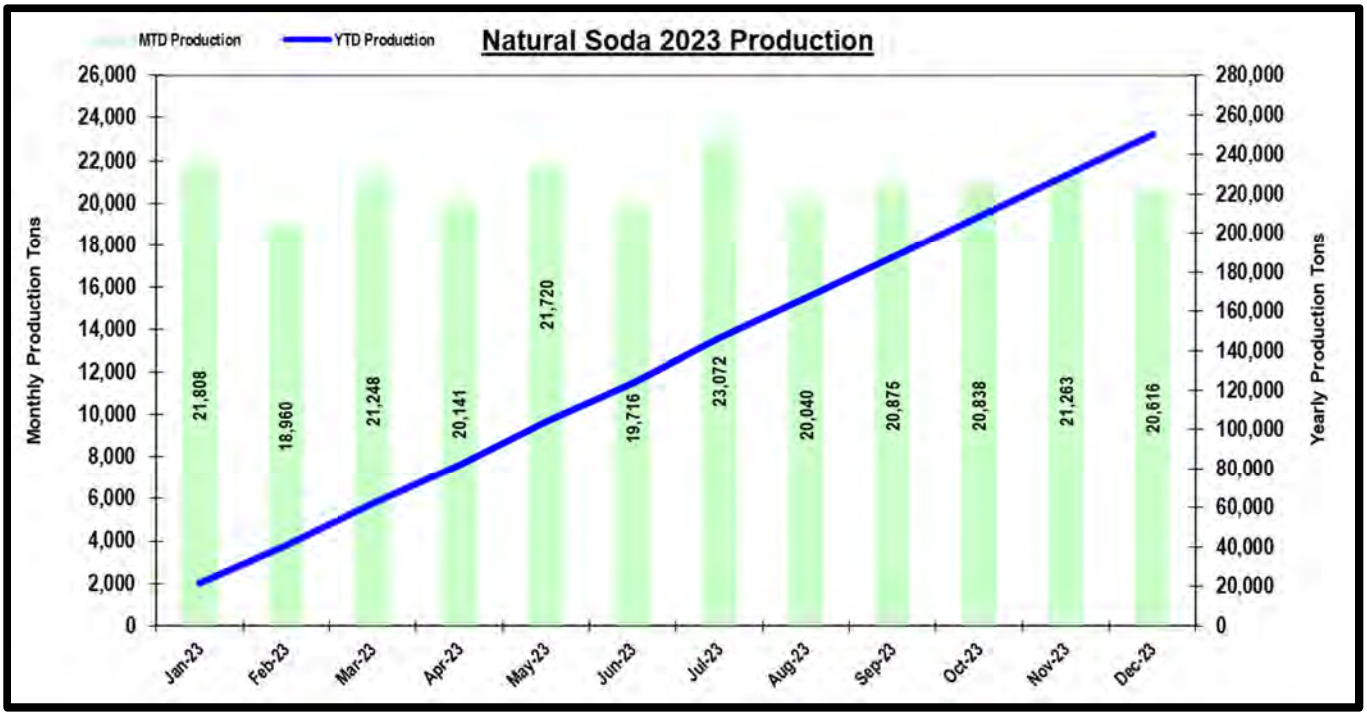


Figure 7: NS 2023 Production (Confidential)

4.4. Geotechnical Program (Geophysical Logging)

4.4.1. Subsurface Subsidence Geophysical Logging

NS conducted the EPA mandated subsurface subsidence logging in the 15H-SSMW well July 2023, the analysis indicated no subsurface subsidence to the depth of 1,750. The 15H-SSMW serves as the subsidence monitor well for the 15H and 16H west mining intervals.

- NS conducted routine, EPA mandated subsurface subsidence logging in their 15H-SSMW well on July 14, 2023. This well serves as the SSMW for the western portions of the 15H and 16H mining intervals. This SSMW log was compared to the baseline SSMW log (July 9, 2016) and indicated no subsurface subsidence to the log total depth of 1,750 feet measured depth below ground level (MD GL).
- DRG & Associates, Inc. conducted routine EPA mandated Surface Subsidence Monuments (SSMs) biennial surveys on June 20th, 2023. Results were reported to the EPA on July 5, 2023.

4.4.2. Surface Subsidence Monitoring

A surface subsidence monument (SSM) survey of all monuments above NS's area of operations was conducted in the second quarter of 2023. Results of the 2023 SSM survey are shown in Table 5 below, and survey results were reported to the EPA July 2023. The next planed SSM survey will be conducted in the second quarter of 2025.

In 2024 a new SSM will be installed above the 18H west mining interval that will be drilled and completed during the spring/summer of 2024.

Table 5: 2023 Surface Subsidence Monuments (SSMs) Surveyed Elevations

Surface Subsidence Monument (SSM)	Initial Monument Elevation (ft. AMSL)	2023 Monument Elevation (ft. AMSL)	Elevation Change (ft.)
CP SODA BM	6634.90	6634.90	0.00
CP CENTER SSM	6658.99	6658.93	-0.06
CP NORTH SSM	6639.21	6639.20	-0.01
CP EAST SSM	6669.52	6669.31	-0.21
CP SOUTH SSM	6683.84	6683.71	-0.13
CP WEST SSM	6669.77	6669.80	0.02
CP 6 SSM	6682.88	6682.92	0.04
CP 7 SSM	6706.52	6706.44	-0.08
CP 8 SSM	6691.65	6691.63	-0.02
CP 10 SSM	6687.41	6687.32	-0.09
CP 11 SSM	6653.71	6653.60	-0.11
CP 12 SSM	6702.11	6702.06	-0.05
CP 13 SSM	6725.22	6725.20	-0.02
CP 14 SSM	6758.42	6758.36	-0.06
CP 15 SSM	6624.65	6624.61	-0.04
10H SSM	6712.95	6712.51	-0.44
11H SSM	6705.81	6705.16	-0.64
12H SSM	6695.86	6695.36	-0.50
12HA SSM	6661.41	6661.31	-0.10
13H SSM	6684.47	6683.91	-0.57
14H SSM	6675.20	6674.79	-0.41
15X SSM	6694.41	6694.33	-0.07
15H SSM	6702.35	6702.24	-0.10
16H SSM	6713.03	6712.99	-0.04
17H SSM	6719.06	6719.04	-0.01
17HA SSM	6738.67	6738.51	-0.16

4.5. Water Supply Well Pumpage

In 2023, approximately 82.59 million gallons of water were pumped from water supply wells WSW-2, WSW-3, and WSW-4 with an average of 156.9 gpm. Included in the following Table 6 is a summary of water supply pumpage in 2023. The 2023 total pumpage increased 0.50 million gallons from the 2022 pumpage total of 82.09 million gallons. The 2023 total pumpage from WSW-2 was 99,900 gallons, WSW-3 was 41.13 million gallons, and the total pumpage from WSW-4 was 41.36 million gallons.

NS continued to release water from the WSW-3 and WSW-4 in 2023 to meet obligations for White River water rights call. The 2022 WY Augmentation Plan (88CW420) required NS to release 241,800 gallons (0.74 acre feet) of water per month during months the water call was in place outside of irrigation season. For the 2023 WY the amount of water required to be released was increased to 256,445 gallons (0.79 acre feet) of water per month. For calendar year 2023 the water call was in place January, February, March, November, and December. NS released 1,241.300 gallons of water in 2023, and 242,000 gallons in 2022 for a total of 1,483,300 gallons since the water rights call began in December 2022.

Table 6: NS Water Supply Well Pumpage 2023

2023 Date	WSW-2 (#074491-F)	WSW-3 (#077834-F)	WSW-4 (#077833-F)	Total	Avg.	Water Augmentation
	(gal)	(gal)	(gal)	(gal)	(gpm)	(gal)
Jan	2,500	2,521,500	2,584,600	**5,108,600**	114.4	**242,000**
Feb	3,000	2,445,500	2,594,200	**5,042,700**	125.1	**242,000**
Mar	3,300	3,573,600	3,828,800	**7,405,700**	165.9	**242,000**
Apr	5,400	3,261,600	2,839,400	**6,106,400**	141.4	**0**
May	0	3,806,500	3,751,400	**7,557,900**	169.3	**0**
Jun	6,000	3,466,500	3,381,800	**6,854,300**	158.7	**0**
Jul	1,100	3,744,600	3,915,800	**7,661,500**	171.6	**0**
Aug	21,800	3,777,000	3,870,500	**7,669,300**	171.8	**0**
Sep	7,800	3,500,200	3,539,800	**7,047,800**	163.1	**0**
Oct	20,700	4,067,800	4,073,200	**8,161,700**	182.8	**0**
Nov	2,900	3,524,200	3,500,600	**7,027,700**	162.7	**258,500**
Dec	25,400	3,445,200	3,477,900	**6,948,500**	155.7	**256,800**
Total:	**99,900**	**41,134,200**	**41,358,000**	**82,592,100**	156.88	**1,241,300**

5.0 Environmental Monitoring and Protection

5.1. Hydrology Monitoring

5.1.1. Introduction

NS's hydrology monitoring program concentrates on groundwater, as there are no perennial streams or springs located on the NS's sodium leases. The USGS stream gauging station-monitoring program is conducted, with NS support, to provide regional surface stream flow data on Yellow Creek and Piceance Creek.

The hydrology-monitoring plan is designed to identify impacts of NS's solution mining operations on underground sources of drinking water, as designated by the US EPA.

Refer to Figure 3 and Figure 4 for the locations of existing monitor wells. Groundwater analytical results are presented in Appendix A.

5.1.1. Monitoring Wells

Per regulatory requirements, dedicated groundwater monitoring wells have been constructed to monitor four water-bearing intervals identified as the Perched, A-Groove, B-Groove, and the Dissolution Surface (DS) Aquifers. The DS Aquifer has been exempted as an underground source of drinking water in the NS lease and permit areas. The DS Aquifer monitored by NS contains total dissolved solids (TDS) values in excess of 10,000 parts per million (PPM). These four aquifers are monitored at several locations across the solution mining area: up and down-gradient, remote down-gradient, and near the southeast portion of Section 26. Baseline and current groundwater monitoring data have been obtained from 1991 through present. Refer to Figure 3 and Figure 4 or well locations.

The Perched Aquifer is characteristically lower in TDS, conductivity, fluoride, SAR (sodium absorption ratio) and moderate to higher in sulfate and pH. The A-Groove and B-Groove Aquifers are similar in water quality with moderate TDS, conductivity, SAR, but higher fluoride. However, the B-Groove Aquifer generally has slightly higher levels of TDS, conductivity, SAR, and fluoride. The DS Aquifer is characterized by very high TDS and conductivity (30,000 to >100,000 ppm), higher SAR, magnesium, potassium, moderate pH, and a generally higher fluoride and boron.

In 2023, the results of groundwater monitoring were analyzed for potential anomalies in order to prevent or mitigate potential negative impacts to the USDW's.

Appendix A contains detailed sampling results for groundwater monitoring wells.

5.1.2. Storage and Evaporation Ponds

The NS storage and evaporation ponds have a secondary liner and are constructed to collect and direct any condensation or leakage to tubes for removal. Pond information is reported on a monthly basis. No changes occurred to the evaporations ponds in 2023, routine maintenance and monitoring continued throughout the year.

5.1.3. Potentiometric Surface Maps (Confidential)

Using groundwater potentiometric elevations from NS groundwater monitoring wells and other NS wells, A-Groove and B-Groove Aquifer potentiometric surface maps have been plotted and have been included with this report in Appendix B (Confidential).

5.1.4. Stream Gauging Stations

NS contracts with the USGS to monitor surface waters for water quality and quantity. Monitoring was performed upstream and downstream relative to the NS mining operations and with respect to Yellow Creek and Piceance Creek at four existing stations with extensive historical data. Historical stream gauging data is reported in this document and discharge data is complete through the 2023 water year (WY) (October 2022 – September 2023).

The USGS surface water data are available to the public from the USGS web site at http://co.water.usgs.gov. Table 7 and Table 8 summarize key 2023 WY data for surface water near the NS site. Data reported in Table 7 and Table 8 is compiled from the USGS web site. The Specific Conductance and Temperature data included in the tables were generated by using USGS lab test results for each stream reported on the USGS web site during the 2023 WY.

The USGS notes in the 2022 and 2023 year end water reports that the 6200 (Piceance Creek below Ryan Gulch) has diversions for irrigation upstream of the monitor station. The 6222 (Piceance Creek at White River) has diversions for irrigation of approximately 5,500 acres upstream from the monitor station. The 6255 (Yellow Creek near White River) has diversions to irrigate approximately 300 acres upstream from the monitor station. The 6242 (Corral Gulch near Rangely) which historically has been a low flow stream is not reported as having any diversions upstream from the monitoring station.

The 2023 WY discharge (cfs) data in this area indicated an increase in average stream discharge levels for the 6242 Corral Gulch, 6255 Yellow Creek, 6200 and 6222 Piceance Creek streams. 2023 discharge was above the average Period of Record (PR) historic levels, but did not reach the maximum discharge as seen in the 1984, 1985 and 1986 WY's. The 2011 WY was the last time similar discharge values to 2023 WY were recorded in the streams of interest.

Table 7: Historical Comparison with 2023 Water Year Data

Station	Discharge P of R*	Discharge 2023 WY**	Average Total Discharge P of R	Total Discharge 2023	Specific conductance (µS/cm @ 25° C)				Temp (°c.)	
					P of R	2023 WY	P of R	2023 WY	P of R	2023 WY
	cfs	cfs	ac ft/yr	ac ft/yr	Max	Max	Min	Min	Max	Max
6200	24.90 (58 yrs)	30.30	17,991	21,936	2,800	1,840	600	928	26.3	13.3
6222	30.40 (57 yrs)	36.90	22,008	26,714	7,240	2,970	516	1,150	30.0	15.9
6242	1.50 (48 yrs)	2.63	1,073	1,904	1,760	1,460	312	1,160	24.0	13.7
6255	2.30 (45 yrs)	2.42	1,672	1,752	5,330	4,710	460	2,160	31.0	17.6

6200 Piceance Creek below Ryan Gulch | 6242 Corral Gulch near Rangely

6222 Piceance Creek at White River | 6255 Yellow Creek near White River

* P of R = Period of Record for collection of data. | **WY = Water Year (October-September).

cfs = cubic feet per second, average annual flow. | N/D = No data available at time of publication

Table 8: Yellow and Piceance Creek Discharge Data up to 2023 Water Year

Project Data Comparison

Discharge for Water Years in cfs

Station	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
6200	13.4	36.2	17.5	11.3	10.7	15.9	17.0	11.7	7.5	9.6	10.9	5.9	7.1	30.3
6222	17.6	41.7	19.2	11.8	13.0	19.7	21.2	15.5	8.9	11.6	12.4	7.4	8.2	36.9
6242	0.3	1.1	0.3	0.2	0.5	0.5	1.9	0.6	0.1	1.0	0.4	0.2	0.8	2.6
6255	0.9	1.3	1.2	1.1	1.2	1.3	1.3	1.7	0.8	1.6	0.9	0.5	2.0	2.4

Maximum Specific Conductance (µS/cm @ 25° C)

Station	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
6200	2,020	1,460	1,610	1,930	2,040	1,770	1,840	2,120	1,700	1,740	1,590	2,100	1,760	1,840
6222	4,800	2,290	5,350	5,100	3,190	2,790	2,020	3,550	5,350	3,300	4,160	4,610	4,650	2,970
6242	1,460	1,280	1,480	1,430	1,400	1,330	1,170	1,280	1,490	1,480	1,260	1,440	1,470	1,460
6255	4,260	4,130	4,170	4,720	4,530	4,070	4,520	3,600	3,980	4,530	4,560	4,560	5,330	4,710

* P of R = Period of Record for collection of data. | **WY = Water Year (October-September). | cfs = cubic feet per second, average annual flow.

6200 Piceance Creek below Ryan Gulch | 6242 Corral Gulch near Rangely

6222 Piceance Creek at White River | 6255 Yellow Creek near White River

N/D No data available at time of publication.

NS data indicated a precipitation decrease at the NS location in 2023 (9.81") compared to 2022 (10.35"). The 2023 precipitation at NS and was similar to the 2022 (10.35"), 2021 (10.09"), and 2020 (9.79") values, and approximately half that of 2019 (20.8"). A similar pattern of annual total precipitation (2019 WY through 2023 WY) can be observed thorough Piceance Creek Basin. Decreases and increases in precipitation and/or changes to irrigation diversions may be affecting stream flow discharge at some level, but it cannot account for the 2023 discharge increase. The increase in discharge is likely attributable to the measured snow pack levels (Snow Water Equivalent (Inches)) found in the Yampa-White-Little Snake Basin and the Colorado Headwaters Basin to the East and Northeast of NS. In 2011 WY the snow pack measurements in these two basins was similar to 2023 WY and the four streams experienced similar discharge rates. Figure 8 and Figure 9 below show the difference between 2022 WY and 2023 WY with regards to snow pack levels in the two basins and the discharge rates in the four streams. The maximum snow pack for the basins were recorded in 1984, 1985, and 1986 WY's, this also corresponds to the maximum stream discharge rates for all four streams.

The 2023 Specific Conductance data from USGS for the four stations were all within the range values for the period of record. The 6200 (Piceance Creek below Ryan Gulch) was the only stream location that had a slight increase in Specific Conductance in 2023, the other three streams had decreases in Max Specific Conductance from the 2022 to 2023 WY. The 2023 water temperature values were within the range of historic PR data. The water temperatures maximums for all four streams were approximately half the value of the PR all time maximums. Post review of the USGS data, no effect on stream water quality or quantity was noted due to the NS mining operations.

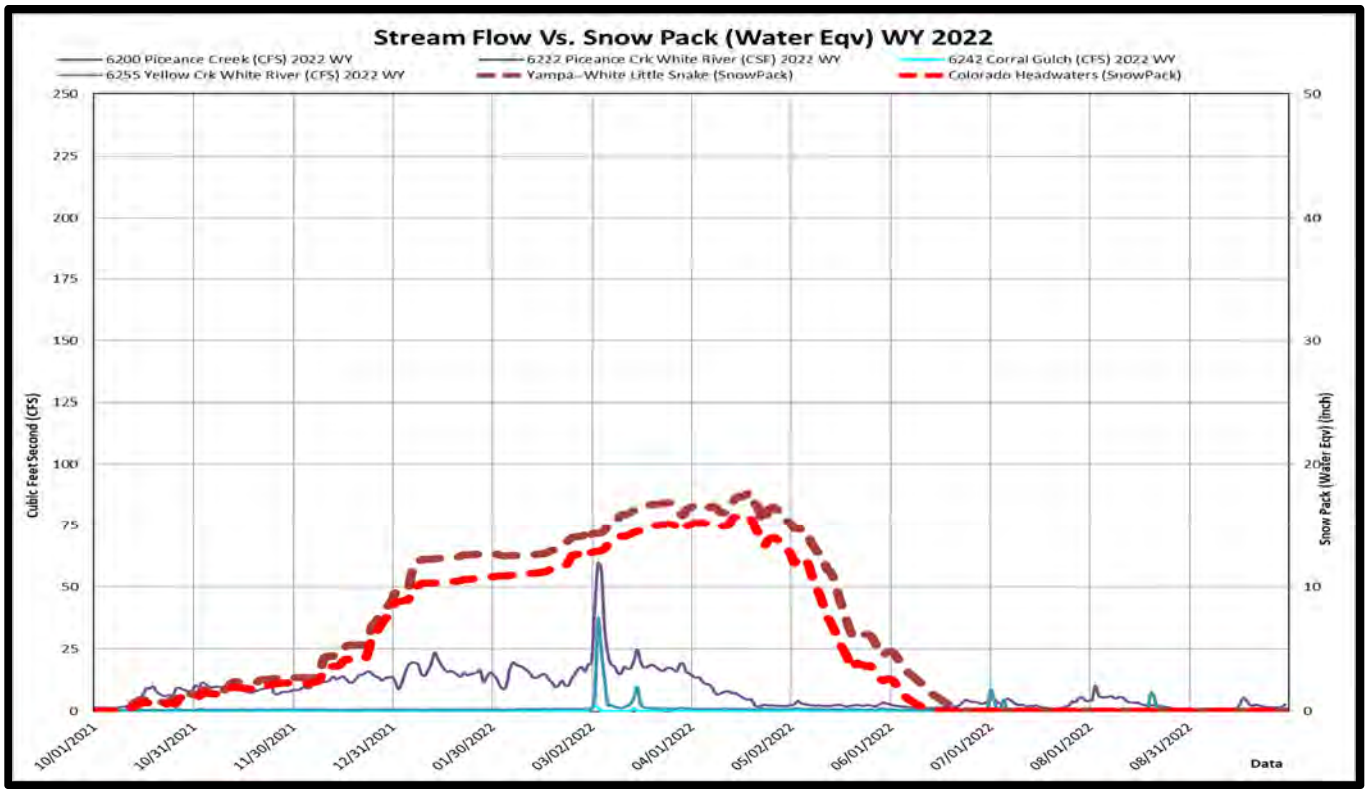


Figure 8: Water Year 2022 Stream Flow (cfs) Vs. Snow Pack (Water Eqv (Inch))

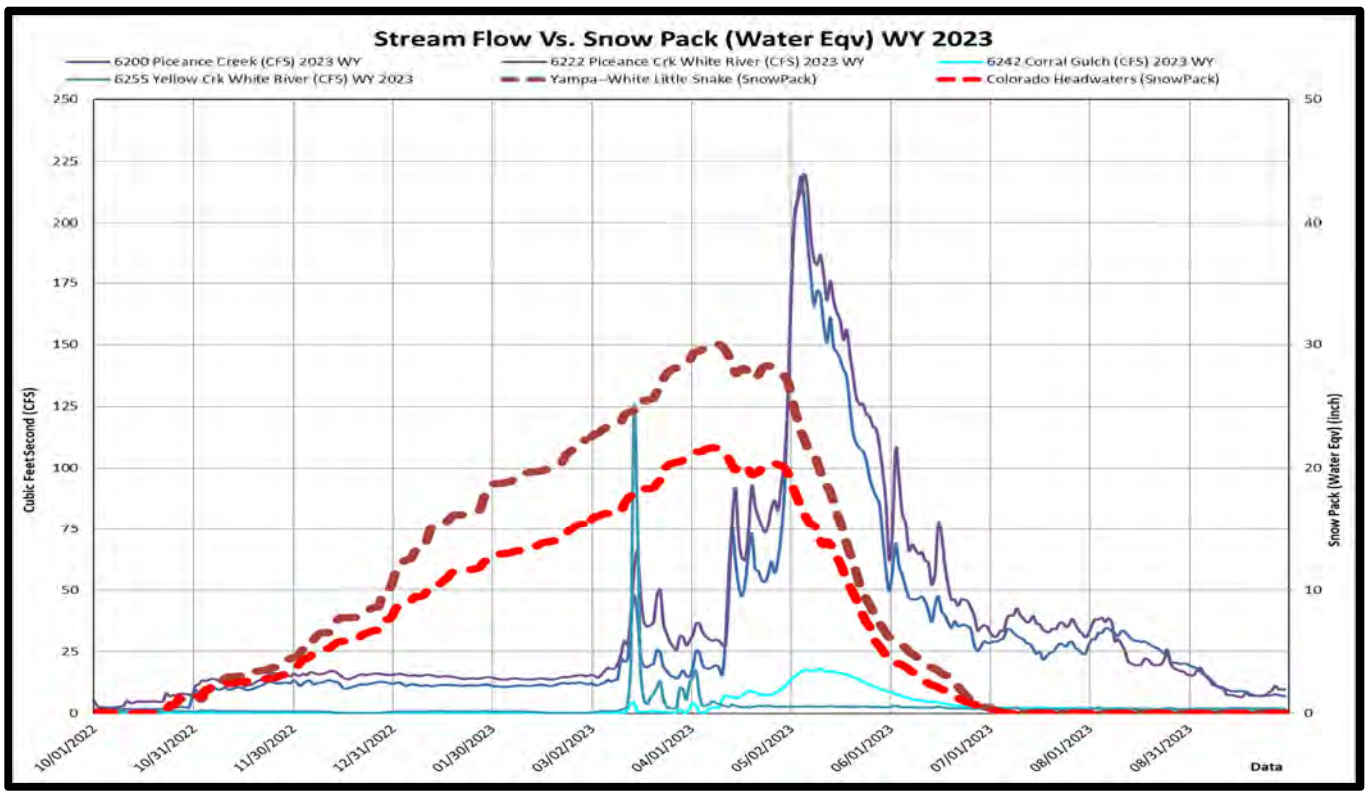


Figure 9: Water Year 2023 Stream Flow (cfs) Vs. Snow Pack (Water Eqv (Inch))

5.2. Injection Well Mechanical Integrity (MIT)

5.2.1. MIT Introduction

The EPA Underground Injection Control (UIC) regulations require that an injection well have mechanical integrity at all time (40 CFR 144.28 (f)(2) and 40 CFR 144.51 (q)(1)). A well has mechanical integrity (40 CFR 146.8) if:

- There is no significant leak in the tubing, casing or packer; and
- There is no significant fluid movement into an underground source of drinking water (USDW) through vertical channels adjacent to the injection wellbore.

The mechanical integrity of an injection well must be maintained at all times. Mechanical integrity pressure tests are required initially upon construction and at least every five (5) years. If for any reason the tubing/packer is pulled, however, the injection well is required to pass another mechanical integrity test prior to recommencing injection regardless of when the last test was conducted. The Regional UIC program must be notified of the workover and the proposed date of the pressure test. The well's test cycle would then start from the date of the new test if the well passes the test and documentation is adequate. Tests may be required on a more frequent basis depending on the nature of the injectate and the construction of the well.

5.2.2. Mechanical Integrity, Part 1 Pressure Testing and Part 2 Temperature Logging

NS conducted routine, EPA mandated, MIT Part 1 pressure testing and/or Part 2 temperature logging in the following injection wells on the indicated dates, no anomalies were detected during any testing or logging. All required documentation was submitted to the EPA and cc'd to the BLM.

- 17H-IR-E MIT P2 (Initial) January 18, 2023
- 12H-IR MIT P2 (5 Year) February 17, 2023
- 12 H-IR MIT P1 (5 Year) February 24, 2023
- 13H-IR MIT P2 (5 Year) July 17, 2023
- 13H-IR MIT P1 (5 Year) July 18, 2023
- 15H-R(I) MIT P1 (5 Year) August 2, 2023
- 12H-I MIT P2 (10 Year) August 4, 2023
- 15H-R(I) MIT P2 (5 Year) July 31, 2023
- 13H-R(I) MIT P2 (5 Year) October 9, 2023
- 13H-R(I) MIT P1 (5 Year) October 10, 2023

6.0 Land Disturbance and Reclamation

6.1. Summary of 2023 Disturbance

NS created 5.68 acres of new disturbed acreage in 2023 by building the 18H-1V Pad (2.95 ac), 18H-1V access & pipeline road (0.53 ac), 18H-IR-W Pad (2.14 ac) and the 18H-IR-W access road (0.06 ac). The 17H-E SSMW location with a small access road (0.64 ac) categorized as disturbed was interim-reclaimed in the fall of 2023. Following the P&A of the 14H-R(I) well in summer 2023, the 14H-I&R pad (2.26 disturbed) was fully reclaimed in the fall. Three locations that were previously interim-reclaimed have been reclassified as reclaimed in 2023 due to the wells on the locations being P&A'ed; 2M & 3M TDR pad (0.13 ac), DS-2/BG-1 pad (0.15 ac) and the 4A-1V pad (1.33 ac). These three locations may require some additional dirt work in 2024.

The total disturbed acreage reported in 2022 was 98.85 acres, and in 2023 the NS land disturbance increased to 104.53 acres. The total affected acreage of NS operations increased in 2023 to 114.59 acres from 108.91 acres in 2022. The total affected acreage includes 10.06 acres that have been 'Recognized as Reclaimed by Agency'. Table 9 lists the disturbed acreage as of December 2023.

Table 9: Disturbed Acreage

Process Area:	**Acres:**
Plant Site Disturbed	26.85
Plant Site Undergoing Interim Reclamation	4.46
Plant Site Undergoing Final Reclamation	0.00
Plant Site Successfully Reclaimed	0.00
Well Field:	
Roads Disturbed	3.07
Well Pads Disturbed	33.32
Roads/Misc. Undergoing Interim Reclamation	1.26
Well Pads Undergoing Interim Reclamation	13.71
Road/Misc. Undergoing Final Reclamation	3.14
Well Pads Undergoing Final Reclamation	18.72
Total Disturbance:	**104.53**
Road/Misc. -- Recognized as Reclaimed by Agencies	1.05
Well Pads -- Recognized as Reclaimed by Agencies	9.01
Total Effected Acreage:	**114.59**

6.2. Regulatory Compliance

6.2.1. Regulatory Activity

In 2023, required reports were submitted in a timely manner. Required forms were submitted to the appropriate agencies regarding activities pertaining to the new wells drilled & associated plugging and abandonment operations.

6.3. Reclamation Activity

6.3.1. Regrading & Scarification

Regrading, and scarification occurred in the fall of 2023 when the 17H-E-SSMW location was interim-reclaimed, and the 14H-I&R location was fully reclaimed by Moody Services.

6.3.2. Seeding & Weed Control

During the fall of 2023, seeding was conducted by Moody Services on the newly reclaimed 14H-I&R location and interim-reclaimed 17H-E SSMW pad. BG-9 access road was reseeded. The T & U locations had additional seeding performed by Moody Services in 2023.

Moody Services was contracted for weed management and sprayed active well pads, utility locations, pads undergoing reclamation, various roadways, and around facilities in 2023.

Annual vegetation monitoring continued in 2023 for the areas of study that are currently in final reclamation status. The report, ***The 2023 Vegetation Monitoring Reclamation Status Report,*** prepared by Mr. Rusty Roberts, is presented in Appendix C.

6.3.3. Reclamation Fencing

Repair and maintenance activities were performed, as necessary, on existing fences in 2023.

6.3.4. Precipitation

Perennial vegetation is an indicator of long-term precipitation, the "normal" precipitation for the NS site is 12-14 inches for the calendar year. The 32 year average at the NS site is 12.54 inches per year, and the 10 year average is 14.60 inches per year. The distribution of precipitation is important for proper reclamation. The 2023 precipitation as measured at the NS plant was 9.81 inches. 2023 marks the fourth year in a row that precipitation at NS was below the 32 year average and ranged from a low of 9.79 inches in 2020 to a high of 10.35 inches in 2022. Table 10 provides a composite of precipitation from the NS mine site for the last 10 years.

Table 10: Annual Precipitation in inches (10 Year)

Month/Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	AVG
Jan	0.98	0.47	1.62	1.89	1.26	0.67	1.06	0.32	0.55	1.20	1.00
Feb	0.35	0.39	1.34	1.52	1.35	1.47	0.83	0.17	0.47	1.10	0.90
Mar	0.28	0.82	1.76	1.01	1.55	0.85	0.95	0.60	0.78	0.80	0.96
Apr	0.63	1.71	5.18	1.11	1.74	2.99	0.82	0.20	0.54	0.40	1.53
May	1.66	4.36	2.06	2.17	1.52	2.93	1.29	0.38	1.20	0.43	1.80
Jun	0.01	0.51	0.53	0.47	0.99	3.86	1.83	0.84	0.61	1.03	1.07
Jul	1.34	1.78	1.07	3.36	1.27	1.87	0.61	0.39	0.92	1.00	1.36
Aug	3.17	1.44	2.78	0.85	3.24	0.83	0.37	1.16	0.48	0.70	1.50
Sep	2.14	0.32	2.19	1.55	0.10	1.75	1.17	1.50	1.40	0.40	1.25
Oct	1.09	1.38	1.89	1.62	4.10	1.19	0.08	1.93	1.40	1.30	1.60
Nov	0.80	0.70	1.56	0.64	0.60	1.62	0.14	0.60	0.50	0.80	0.80
Dec	1.00	0.10	1.04	0.44	0.45	0.71	0.66	1.80	1.50	0.65	0.84
Annual Totals	13.45	13.97	23.02	16.63	18.17	20.75	9.79	10.09	10.35	9.81	14.60

6.3.5. Vegetation Monitoring Results

A vegetation survey is undertaken annually on the NS lease to collect data from reclaimed land to monitor and evaluate the success of revegetation efforts.

In 2023 the vegetation survey focused on six reclaimed pad sites in final reclamation status, and four additional undisturbed areas for comparison purposes.

Five of the six locations studied are former core holes; BG-8, G, MMC-IRI-3, T, and U that are currently undergoing final reclamation. One former production well P&A location the 93-2M is in final reclamation status.

The continued dry conditions that occurred during the growing season in 2023 resulted in only minimal changes to the total vegetation cover and composition of desirable plant species as compared to the values measured in 2022 or with comparison to the undisturbed control areas. All of the sites showed improvement in the study. Pad G met the criteria for successful reclamation. Pat T and Pad U both have increases in Non-Native Invasive species that may require remediation in 2024 and possible reseeding. None of the above mentioned reclaimed sites achieved successful reclamation criteria in 2023. For details of the 2023 vegetation monitoring results, refer to Appendix C for the full ***2023 Vegetation Monitoring Reclamation Status Report*** prepared for NS by Mr. Rusty Roberts.

6.4. Deer Roadkill Study

Per the monitoring requirement from the BLM, NS compiled deer road kill data throughout 2023 for vehicles traveling to and from the mine site. One deer (female sex) was reported as struck but ran from accident with unknown injuries to the animal. Six deer of unknown sex were reported as struck and killed in 2023. One additional deer of unknown sex was reported as struck but departed with unknown injuries to the animal.

6.5. Raptor Survey

On May 15 and 16, 2023 D&A, Inc. conducted a raptor breeding activity survey and inventory on behalf of NS in the pinion juniper habitat that is proximal to the planned 2024 production wells 18H-1V & 18H-IR-W, and planned 2025/2026 production wells 19H-1V & 19H-IR-E well drilling. A pedestrian survey, with the addition of call-playback techniques, was undertaken. The surveyed area included portions of sections 25, 26, 27, 34, 35, and 36 of T1S, R98W. The BLM WRFO assisted NS by identifying areas which may provide the most suitable raptor nesting habitat within the project area. One new nest was observed within the study area that was inactive/abandoned. Two known nest (one active, one inactive) were observed just outside of the study area. Ravens were observed in the southwest region of the study area, and the observance of the Ravens led to the discovery of Copper's Hawk occupying a nest outside of the 2023 survey area and was documented. Weather conditions during the survey were optimal with partly cloudy skies, short drizzle of rain on May 15, 2023, and full sun on May 16, 2023. Air temperatures during the survey ranged from 65 to 75 degrees Fahrenheit. A report was written and submitted to the BLM following completion of the survey. The area surveyed in 2023 included the areas of the planned 2024 well field development activities, therefore, per BLM guidelines, no raptor survey will be conducted in 2024.

6.6. Other Observations

Elk, deer, coyotes, rabbits, bobcat, badger and fox were noted in and around the well-field throughout the year.

6.7. Waste Disposal

Common domestic solid waste was collected in containers and periodically transported to the Rio Blanco County landfill. Sewage from the plant was directed to a septic system with a leach drain field. Process water, including cooling tower blowdowns, boiler ditch, plant wash down, blow down from the boilers, and precipitation runoff, was directed to the process pond. A pump in the process storage pond allows NS to recycle the water to the barren system. The wastewater evaporation pond contains water from the cooling tower overflow and laboratory drains.

Hazardous waste that is generated and collected at the NS facilities is contained safely, stored separately from day to day waste, and then disposed of properly by Clean Harbors, Inc., a certified hazardous waste handling/disposal company. NS did not dispose of any hazardous waste in 2023.

Natural Soda LLC

Appendix A: 2023 Groundwater Analytical Results

Appx. Table A-1: 89-3 Annual Perched Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	194	903.00	12/12/2008	41.00	01/30/1997	517.28	mg/l
Carbonate as CaCO3	194	566.00	01/30/1997	8.00	11/28/1990	91.18	mg/l
Total Alkalinity as CaCO3	194	926.00	12/12/2008	160.00	10/25/1990	606.84	mg/l
Bromide	27	3.00	06/26/1990	0.05	07/01/1997	0.44	mg/l
Cation-Anion Balance	185	63.40	04/14/2005	-28.80	08/02/2006	0.46	%
Sum of Anions	168	20.10	12/12/2008	11.66	11/28/1990	14.15	meq/l
Sum of Cations	168	67.50	04/14/2005	7.80	08/02/2006	14.40	meq/l
Chemical Oxygen Demand	24	220.00	09/22/2010	10.00	08/02/2006	80.23	mg/l
Chloride	193	118.00	10/22/1989	2.00	04/24/1991	19.12	mg/l
Conductivity, Lab	191	1,760.00	12/12/2008	1,000.00	05/20/1993	1,257.48	µmhos
Fluoride	194	30.00	12/19/1991	1.90	06/26/1991	21.33	mg/l
Hardness as CaCO3	188	375.00	05/21/2018	0.40	10/25/1990	11.70	mg/l
Nitrate as N, dissolved	28	5.76	08/10/2008	0.02	07/18/1995	0.53	mg/l
Nitrate/Nitrite as N,	28	6.26	08/10/2008	0.02	07/18/1995	0.56	mg/l
Nitrite as N, dissolved	28	0.50	08/10/2008	0.01	03/30/1990	0.13	mg/l
Nitrogen, Ammonia	26	3.77	08/10/2008	0.54	06/15/1992	1.30	mg/l
Nitrogen, Organic	26	14.60	09/27/1990	0.10	06/15/1992	4.37	mg/l
Nitrogen, Total Kjeldahl	26	15.40	09/27/1990	0.60	06/15/1992	5.49	mg/l
pH, lab	190	9.70	12/20/1994	8.00	07/18/1995	8.92	units
Phosphate, total	22	155.00	06/25/2007	0.06	07/02/1998	10.79	mg/l
Phosphorus, total	27	0.46	06/26/1990	0.01	08/17/1993	0.08	mg/l
SAR in Water	151	345.00	04/14/2005	0.21	05/21/2018	56.18	none
Sulfate	194	445.00	06/26/1990	2.49	05/21/2018	40.76	mg/l
Sulfide	23	2.40	07/24/2002	0.02	07/15/2004	0.45	mg/l
Total Dissolved Solids	194	2,040.00	04/14/2005	494.00	10/25/1990	783.43	mg/l
Conductivity, Field	241	1,980.00	12/12/2008	620.00	03/16/1994	1,222.41	µmhos
pH, Field	241	10.00	08/22/1991	6.80	03/10/2015	9.08	units
Temperature (°C), Field	121	17.40	07/01/2002	8.10	02/08/2021	12.30	(°C)
Water Level, Field	107	545.20	06/25/2014	463.95	04/01/2003	497.61	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	26	0.70	10/22/1989	0.03	07/01/1997	0.12	mg/l
Arsenic, dissolved	26	0.04	06/26/1991	0.00	06/15/1992	0.01	mg/l
Barium, dissolved	26	0.23	07/15/2004	0.01	08/02/2006	0.04	mg/l
Beryllium, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Boron, dissolved	187	1.48	04/14/2005	0.19	08/02/2006	0.37	mg/l
Cadmium, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Calcium, dissolved	186	141.00	05/21/2018	0.30	04/27/2004	2.48	mg/l
Chromium, dissolved	26	0.07	07/30/2003	0.01	06/26/1990	0.04	mg/l
Copper, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Iron, dissolved	26	0.80	10/22/1989	0.01	07/18/1995	0.13	mg/l
Lead, dissolved	26	0.05	10/22/1989	0.02	06/26/1990	0.03	mg/l
Lithium, dissolved	26	0.13	07/15/2004	0.02	06/26/1990	0.05	mg/l
Magnesium, dissolved	186	9.10	12/12/2008	0.20	04/27/2004	1.28	mg/l
Manganese, dissolved	25	0.14	07/30/2003	0.01	06/26/1990	0.06	mg/l
Mercury, dissolved	26	0.0006	06/15/1992	0.0001	06/26/1990	0.0004	mg/l
Molybdenum, dissolved	26	0.13	10/22/1989	0.01	07/12/1996	0.05	mg/l
Nickel, dissolved	26	0.52	07/30/2003	0.02	10/22/1989	0.19	mg/l
Potassium, dissolved	187	12.50	05/21/2018	0.50	06/10/2020	1.34	mg/l
Selenium, dissolved	26	0.009	09/27/1990	0.001	06/26/1990	0.004	mg/l
Silica, dissolved	187	27.70	01/09/2001	2.00	12/10/2019	12.52	mg/l
Sodium, dissolved	187	1,530.00	04/14/2005	9.20	05/21/2018	321.05	mg/l
Strontium, dissolved	187	1.34	12/12/2008	0.03	04/27/2004	0.20	mg/l
Vanadium, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Zinc, dissolved	26	0.03	07/29/2009	0.01	06/26/1990	0.02	mg/l

Appx. Table A-2: MMC-IRI-1 Annual Perched Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	125	548.00	01/08/2015	0.0000	08/01/1990	161.14	mg/l
Carbonate as CaCO3	125	300.00	10/25/1990	0.0000	08/30/2008	116.79	mg/l
Total Alkalinity as CaCO3	125	900.00	08/01/1990	96.40	08/10/2021	292.88	mg/l
Bromide	28	1.60	07/21/1993	0.06	06/16/2011	0.29	mg/l
Cation-Anion Balance	122	63.90	08/14/2017	-16.00	03/13/2003	0.66	%
Sum of Anions	115	24.97	08/13/1990	5.00	08/10/2021	8.83	meq/l
Sum of Cations	115	50.00	08/14/2017	5.70	06/14/2011	9.28	meq/l
Chemical Oxygen	21	300.00	09/21/2010	10.00	08/16/1994	44.18	mg/l
Chloride	125	400.00	04/24/1991	14.00	12/15/1992	53.43	mg/l
Conductivity, Lab	122	2,630.00	01/20/1992	347.00	08/10/2021	862.52	µmhos
Fluoride	125	24.00	09/02/1998	1.70	04/20/1992	6.41	mg/l
Hardness as CaCO3	125	553.00	08/01/1990	2.00	06/23/2010	36.02	mg/l
Nitrate as N, dissolved	28	2.77	06/26/2002	0.02	06/28/2006	0.35	mg/l
Nitrate/Nitrite as N,	28	2.79	06/26/2002	0.02	09/07/2022	0.32	mg/l
Nitrite as N, dissolved	28	0.13	08/16/1996	0.01	08/01/1990	0.05	mg/l
Nitrogen, Ammonia	27	2.57	07/31/1991	0.25	06/09/1999	0.73	mg/l
Nitrogen, Organic	27	3.90	07/21/1992	0.10	06/16/2011	1.00	mg/l
Nitrogen, Total Kjeldahl	27	5.90	07/31/1991	0.33	09/07/2022	1.73	mg/l
pH, lab	122	11.30	07/31/1991	6.60	08/30/2008	9.56	units
Phosphate, total	26	155.00	06/28/2006	0.03	09/07/2022	16.82	mg/l
Phosphorus, total	27	1.41	09/21/2010	0.01	09/07/2022	0.24	mg/l
SAR in Water	117	76.00	08/14/2017	5.76	08/01/1990	21.12	none
Sulfate	125	243.00	12/15/1992	39.20	08/07/2023	75.14	mg/l
Sulfide	26	4.00	06/13/2001	0.03	06/02/1998	1.08	mg/l
Total Dissolved Solids	123	1,644.00	08/01/1990	328.00	08/10/2021	579.21	mg/l
Conductivity, Field	183	3,500.00	08/01/1990	573.00	08/10/2021	1,140.47	µmhos
pH, Field	183	12.80	12/01/1990	6.04	08/30/2008	10.20	units
Temperature (°C), Field	123	20.90	08/07/2023	6.50	12/12/2008	12.36	(°C)
Water Level, Field	103	387.19	08/14/2017	308.80	06/20/2017	380.42	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	28	11.10	08/16/1996	0.06	07/29/2009	3.18	mg/l
Arsenic, dissolved	28	0.0060	07/31/1991	0.0005	11/27/2012	0.0024	mg/l
Barium, dissolved	28	0.29	08/14/1995	0.01	11/27/2012	0.07	mg/l
Beryllium, dissolved	28	0.012	08/07/2023	0.003	08/14/1995	0.008	mg/l
Boron, dissolved	125	0.39	01/08/2015	0.00	10/25/1990	0.17	mg/l
Cadmium, dissolved	28	0.03	07/21/1993	0.03	07/21/1993	0.03	mg/l
Calcium, dissolved	125	223.00	08/01/1990	0.90	06/23/2010	10.76	mg/l
Chromium, dissolved	28	0.02	08/01/1990	0.01	08/16/1996	0.01	mg/l
Copper, dissolved	28	0.20	06/14/2000	0.01	08/01/1990	0.04	mg/l
Iron, dissolved	28	14.10	07/21/1993	0.02	07/21/1992	3.09	mg/l
Lead, dissolved	28	0.10	07/21/1993	0.05	06/16/1997	0.07	mg/l
Lithium, dissolved	28	0.19	08/13/1990	0.00	08/30/2008	0.05	mg/l
Magnesium, dissolved	125	31.20	03/14/2000	0.30	09/26/2001	2.58	mg/l
Manganese, dissolved	28	0.37	08/14/1995	0.01	08/30/2008	0.08	mg/l
Mercury, dissolved	28	0.0002	08/14/1995	0.0002	08/14/1995	0.0002	mg/l
Molybdenum, dissolved	28	0.10	08/01/1990	0.01	06/16/1997	0.04	mg/l
Nickel, dissolved	28	0.02	10/25/1990	0.01	08/16/1996	0.01	mg/l
Potassium, dissolved	125	146.00	08/01/1990	1.00	04/24/1991	7.44	mg/l
Selenium, dissolved	28	0.0040	07/31/1991	0.0001	08/07/2023	0.0023	mg/l
Silica, dissolved	125	99.30	08/14/1995	6.60	08/07/2023	28.78	mg/l
Sodium, dissolved	125	1,110.00	08/14/2017	124.00	05/18/2021	195.48	mg/l
Strontium, dissolved	125	2.45	08/01/1990	0.02	05/24/1994	0.30	mg/l
Vanadium, dissolved	28	0.03	08/14/1995	0.01	06/16/1997	0.01	mg/l
Zinc, dissolved	28	0.30	08/07/2023	0.02	06/09/1999	0.08	mg/l

Appx. Table A-3: MMC-IRI-5 Annual Perched Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	63	327.00	06/30/2009	2.00	12/18/1991	183.47	mg/l
Carbonate as CaCO3	63	284.00	12/18/1991	0.00	06/14/2008	75.80	mg/l
Total Alkalinity as CaCO3	63	406.00	03/25/1992	181.00	05/29/2002	251.81	mg/l
Bromide	33	1.00	08/22/1991	0.00	08/12/1992	0.21	mg/l
Cation-Anion Balance	60	17.30	06/14/2008	-10.20	05/26/2004	0.74	%
Sum of Anions	55	15.77	06/16/1992	8.43	12/19/1995	9.91	meq/l
Sum of Cations	55	15.25	06/16/1992	7.90	05/26/2004	10.11	meq/l
Chemical Oxygen	30	181.00	11/02/2015	0.00	05/29/2002	52.07	mg/l
Chloride	63	420.00	06/16/1992	9.00	12/19/1995	20.60	mg/l
Conductivity, Lab	63	1,500.00	06/16/1992	795.00	08/12/1991	974.41	µmhos
Fluoride	63	0.90	09/16/1991	0.00	06/30/1995	0.29	mg/l
Hardness as CaCO3	63	182.00	06/14/2008	1.00	12/20/1993	34.57	mg/l
Nitrate as N, dissolved	34	12.50	05/29/2002	0.00	08/12/1992	0.97	mg/l
Nitrate/Nitrite as N,	34	12.50	05/29/2002	0.00	08/12/1992	0.82	mg/l
Nitrite as N, dissolved	34	0.07	02/12/2023	0.00	08/12/1992	0.02	mg/l
Nitrogen, Ammonia	34	0.87	06/23/1994	0.08	05/21/2007	0.27	mg/l
Nitrogen, Organic	34	80.00	05/15/1998	0.20	03/09/2020	5.10	mg/l
Nitrogen, Total Kjeldahl	34	80.00	05/15/1998	0.30	03/09/2020	4.60	mg/l
pH, lab	63	11.90	06/28/1993	2.40	06/16/1992	9.20	units
Phosphate, total	32	155.00	07/29/2009	0.06	05/29/2002	5.47	mg/l
Phosphorus, total	34	1.87	06/18/1996	0.02	05/29/2002	0.20	mg/l
SAR in Water	54	90.44	01/20/1994	7.50	06/30/2009	21.87	none
Sulfate	63	290.00	03/25/1992	148.00	03/22/1996	204.14	mg/l
Sulfide	33	6.60	03/09/2020	0.05	06/14/2008	0.56	mg/l
Total Dissolved Solids	62	1,090	06/16/1992	504	04/21/1994	629	mg/l
Conductivity, Field	76	9,880	05/21/2007	715	12/19/1995	1,166	µmhos
pH, Field	75	12.00	08/12/1992	6.33	06/14/2008	9.84	units
Temperature (°C), Field	36	17	06/14/2008	9.70	11/01/2002	12	(°C)
Water Level, Field	63	248.06	06/15/2010	237.80	11/09/2022	240.65	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	33	10.00	08/22/1992	0.04	05/29/2003	1.01	mg/l
Arsenic, dissolved	33	0.0060	06/18/1996	0.0003	05/26/2004	0.0015	mg/l
Barium, dissolved	33	0.270	05/21/2007	0.013	05/26/2004	0.040	mg/l
Beryllium, dissolved	33	0.005	08/22/1992	0.005	08/22/1992	0.005	mg/l
Boron, dissolved	63	0.11	11/21/2005	0.02	08/22/1997	0.07	mg/l
Cadmium, dissolved	33	0.0050	08/22/1992	0.0000	03/22/2016	0.0025	mg/l
Calcium, dissolved	63	63.60	06/14/2008	1.00	06/16/1992	7.22	mg/l
Chromium, dissolved	33	0.02	08/22/1992	0.01	06/23/1994	0.01	mg/l
Copper, dissolved	33	0.04	06/25/2019	0.01	06/23/1994	0.02	mg/l
Iron, dissolved	33	7.30	08/22/1992	0.01	05/26/2004	0.61	mg/l
Lead, dissolved	33	0.12	03/22/2016	0.02	08/12/1991	0.05	mg/l
Lithium, dissolved	33	0.06	10/03/2012	0.02	02/12/2023	0.03	mg/l
Magnesium, dissolved	63	9.10	06/30/2009	0.30	06/30/1995	4.65	mg/l
Manganese, dissolved	37	0.07	08/22/1992	0.01	08/22/1997	0.02	mg/l
Mercury, dissolved	33	0.0001	08/22/1992	0.0001	08/22/1992	0.0001	mg/l
Molybdenum, dissolved	33	0.03	06/14/2008	0.01	06/18/1996	0.02	mg/l
Nickel, dissolved	33	0.04	07/29/2009	0.02	08/22/1992	0.03	mg/l
Potassium, dissolved	62	22.00	12/18/1991	0.70	06/25/2019	7.14	mg/l
Selenium, dissolved	33	0.001	08/12/1991	0.001	08/12/1991	0.001	mg/l
Silica, dissolved	62	74.00	08/22/1992	10.90	03/21/2017	18.09	mg/l
Sodium, dissolved	62	336.00	06/16/1992	166.00	05/26/2004	207.98	mg/l
Strontium, dissolved	62	1.30	06/30/2009	0.06	06/16/1992	0.50	mg/l
Vanadium, dissolved	33	0.010	08/22/1992	0.010	08/22/1992	0.010	mg/l
Zinc, dissolved	33	0.58	03/15/2022	0.02	06/23/1994	0.07	mg/l

Appx. Table A-4: PA-1 Annual Perched Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	6	602	04/24/2023	395	09/03/2021	474	mg/l
Carbonate as CaCO3	6	124	09/10/2021	39	06/03/2022	72	mg/l
Total Alkalinity as CaCO3	6	602	04/24/2023	479	09/03/2021	535	mg/l
Bromide	5	U	08/21/2021	U	06/03/2022	U	mg/l
Cation-Anion Balance	6	2.60	09/03/2021	-2.60	11/12/2021	0.02	%
Sum of Anions	6	22.00	04/24/2023	19.00	09/03/2021	20.17	meq/l
Sum of Cations	6	21.00	08/21/2021	19.00	11/12/2021	20.17	meq/l
Chemical Oxygen Demand	5	48.00	08/21/2021	20.00	09/03/2021	34.00	mg/l
Chloride	6	16	04/24/2023	7	08/21/2021	12	mg/l
Conductivity, Lab	6	1,730	04/24/2023	1,630	09/03/2021	1,675	µmhos
Fluoride	6	0.65	06/03/2022	0.65	06/03/2022	0.65	mg/l
Hardness as CaCO3	6	630.00	04/24/2023	470.00	11/12/2021	551.83	mg/l
Nitrate as N, dissolved	5	UH	08/21/2021	UH	06/03/2022	UH	mg/l
Nitrate/Nitrite as N,	5	UH	08/21/2021	UH	06/03/2022	UH	mg/l
Nitrite as N, dissolved	5	UH	08/21/2021	UH	06/03/2022	UH	mg/l
Nitrogen, Ammonia	5	0.43	09/10/2021	0.24	04/24/2023	0.36	mg/l
Nitrogen, Organic	5	0.55	09/10/2021	0.22	09/03/2021	0.38	mg/l
Nitrogen, Total Kjeldahl	5	0.98	09/10/2021	0.29	08/21/2021	0.55	mg/l
pH, lab	6	8.80	09/03/2021	8.30	04/24/2023	8.57	units
Phosphate, total	5	1.22	06/03/2022	0.45	08/21/2021	0.80	mg/l
Phosphorus, total	5	0.39	06/03/2022	0.15	08/21/2021	0.26	mg/l
SAR in Water	6	4	11/12/2021	3.20	08/21/2021	4	none
Sulfate	6	448	04/24/2023	407.00	09/10/2021	428	mg/l
Sulfide	5	0.08	04/24/2023	0.08	04/24/2023	0.08	mg/l
Total Dissolved Solids	6	1,250	04/24/2023	1,120	09/03/2021	1,163	mg/l
Conductivity, Field	5	1,720	04/24/2023	1,460	06/06/2022	1,607	µmhos
pH, Field	5	8.60	09/03/2021	7.30	04/24/2023	8.06	units
Temperature (°C), Field	5	16.30	09/10/2021	12.30	04/24/2023	14.62	(°C)
Water Level, Field	11	305.50	11/27/2023	304.90	11/08/2022	305.15	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Arsenic, dissolved	5	0.01	09/10/2021	0.00	04/24/2023	0.00	mg/l
Barium, dissolved	5	0.04	06/03/2022	0.01	09/10/2021	0.02	mg/l
Beryllium, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Boron, dissolved	6	0.12	06/03/2022	0.09	09/03/2021	0.10	mg/l
Cadmium, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Calcium, dissolved	6	75.80	04/24/2023	43.80	11/12/2021	59.62	mg/l
Chromium, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Copper, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Iron, dissolved	5	0.30	09/10/2021	0.06	04/24/2023	0.19	mg/l
Lead, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Lithium, dissolved	5	0.12	09/03/2021	0.08	08/21/2021	0.10	mg/l
Magnesium, dissolved	6	107.00	04/24/2023	87.60	11/12/2021	97.83	mg/l
Manganese, dissolved	5	0.21	08/21/2021	0.02	06/03/2022	0.08	mg/l
Mercury, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Molybdenum, dissolved	5	0.03	09/03/2021	0.02	09/10/2021	0.02	mg/l
Nickel, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Potassium, dissolved	6	15.10	09/10/2021	2.20	08/21/2021	8.51	mg/l
Selenium, dissolved	6	1.00	01/00/1900	0.00	08/21/2021	0.25	mg/l
Silica, dissolved	6	34.00	04/24/2023	21.90	09/03/2021	27.70	mg/l
Sodium, dissolved	6	210	09/10/2021	183	08/21/2021	197	mg/l
Strontium, dissolved	6	3.07	06/03/2022	2.06	08/21/2021	2.59	mg/l
Vanadium, dissolved	5	U	08/21/2021	U	06/03/2022	U	mg/l
Zinc, dissolved	5	0.03	06/03/2022	0.03	06/03/2022	0.03	mg/l

Appx. Table A-5: 89-2 Quarterly A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	194	903.00	12/12/2008	41.00	01/30/1997	517.28	mg/l
Carbonate as CaCO3	194	566.00	01/30/1997	8.00	11/28/1990	91.18	mg/l
Total Alkalinity as CaCO3	194	926.00	12/12/2008	160.00	10/25/1990	606.84	mg/l
Bromide	27	3.00	06/26/1990	0.05	07/01/1997	0.44	mg/l
Cation-Anion Balance	185	63.40	04/14/2005	-28.80	08/02/2006	0.46	%
Sum of Anions	168	20.10	12/12/2008	11.66	11/28/1990	14.15	meq/l
Sum of Cations	168	67.50	04/14/2005	7.80	08/02/2006	14.40	meq/l
Chemical Oxygen Demand	24	220.00	09/22/2010	10.00	08/02/2006	80.23	mg/l
Chloride	193	118.00	10/22/1989	2.00	04/24/1991	19.12	mg/l
Conductivity, Lab	191	1,760.00	12/12/2008	1,000.00	05/20/1993	1,257.48	µmhos
Fluoride	194	30.00	12/19/1991	1.90	06/26/1991	21.33	mg/l
Hardness as CaCO3	188	375.00	05/21/2018	0.40	10/25/1990	11.70	mg/l
Nitrate as N, dissolved	28	5.76	08/10/2008	0.02	07/18/1995	0.53	mg/l
Nitrate/Nitrite as N,	28	6.26	08/10/2008	0.02	07/18/1995	0.56	mg/l
Nitrite as N, dissolved	28	0.50	08/10/2008	0.01	03/30/1990	0.13	mg/l
Nitrogen, Ammonia	26	3.77	08/10/2008	0.54	06/15/1992	1.30	mg/l
Nitrogen, Organic	26	14.60	09/27/1990	0.10	06/15/1992	4.37	mg/l
Nitrogen, Total Kjeldahl	26	15.40	09/27/1990	0.60	06/15/1992	5.49	mg/l
pH, lab	190	9.70	12/20/1994	8.00	07/18/1995	8.92	units
Phosphate, total	22	155.00	06/25/2007	0.06	07/02/1998	10.79	mg/l
Phosphorus, total	27	0.46	06/26/1990	0.01	08/17/1993	0.08	mg/l
SAR in Water	151	345.00	04/14/2005	0.21	05/21/2018	56.18	none
Sulfate	194	445.00	06/26/1990	2.49	05/21/2018	40.76	mg/l
Sulfide	23	2.40	07/24/2002	0.02	07/15/2004	0.45	mg/l
Total Dissolved Solids	194	2,040.00	04/14/2005	494.00	10/25/1990	783.43	mg/l
Conductivity, Field	241	1,980.00	12/12/2008	620.00	03/16/1994	1,222.41	µmhos
pH, Field	241	10.00	08/22/1991	6.80	03/10/2015	9.08	units
Temperature (°C), Field	121	17.40	07/01/2002	8.10	02/08/2021	12.30	(°C)
Water Level, Field	107	545.20	06/25/2014	463.95	04/01/2003	497.61	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	26	0.70	10/22/1989	0.03	07/01/1997	0.12	mg/l
Arsenic, dissolved	26	0.04	06/26/1991	0.00	06/15/1992	0.01	mg/l
Barium, dissolved	26	0.23	07/15/2004	0.01	08/02/2006	0.04	mg/l
Beryllium, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Boron, dissolved	187	1.48	04/14/2005	0.19	08/02/2006	0.37	mg/l
Cadmium, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Calcium, dissolved	186	141.00	05/21/2018	0.30	04/27/2004	2.48	mg/l
Chromium, dissolved	26	0.07	07/30/2003	0.01	06/26/1990	0.04	mg/l
Copper, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Iron, dissolved	26	0.80	10/22/1989	0.01	07/18/1995	0.13	mg/l
Lead, dissolved	26	0.05	10/22/1989	0.02	06/26/1990	0.03	mg/l
Lithium, dissolved	26	0.13	07/15/2004	0.02	06/26/1990	0.05	mg/l
Magnesium, dissolved	186	9.10	12/12/2008	0.20	04/27/2004	1.28	mg/l
Manganese, dissolved	25	0.14	07/30/2003	0.01	06/26/1990	0.06	mg/l
Mercury, dissolved	26	0.0006	06/15/1992	0.0001	06/26/1990	0.0004	mg/l
Molybdenum, dissolved	26	0.13	10/22/1989	0.01	07/12/1996	0.05	mg/l
Nickel, dissolved	26	0.52	07/30/2003	0.02	10/22/1989	0.19	mg/l
Potassium, dissolved	187	12.50	05/21/2018	0.50	06/10/2020	1.34	mg/l
Selenium, dissolved	26	0.009	09/27/1990	0.001	06/26/1990	0.004	mg/l
Silica, dissolved	187	27.70	01/09/2001	2.00	12/10/2019	12.52	mg/l
Sodium, dissolved	187	1,530.00	04/14/2005	9.20	05/21/2018	321.05	mg/l
Strontium, dissolved	187	1.34	12/12/2008	0.03	04/27/2004	0.20	mg/l
Vanadium, dissolved	26	0.01	06/26/1990	0.01	06/26/1990	0.01	mg/l
Zinc, dissolved	26	0.03	07/29/2009	0.01	06/26/1990	0.02	mg/l

Appx. Table A-6: 90-4 Quarterly A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	135	3,430.00	05/16/2023	45.00	06/26/2002	910.39	mg/l
Carbonate as CaCO3	135	693.00	06/26/2002	10.00	12/16/2003	98.30	mg/l
Total Alkalinity as CaCO3	135	3,430.00	05/16/2023	142.00	09/28/2006	995.41	mg/l
Bromide	30	16.00	06/16/1997	0.29	08/01/1990	5.56	mg/l
Cation-Anion Balance	132	11.90	06/23/2010	-68.80	08/15/2017	-2.25	%
Sum of Anions	132	153.40	05/24/1994	34.16	08/01/1990	85.98	meq/l
Sum of Cations	132	143.00	02/27/1997	10.00	08/15/2017	82.91	meq/l
Chemical Oxygen Demand	22	840.00	08/16/1994	10.00	08/16/1996	192.50	mg/l
Chloride	135	4,690.00	05/24/1994	700.00	08/01/1990	2,377.49	mg/l
Conductivity, Lab	132	14,100.00	02/21/1994	309.00	05/27/2015	8,484.00	µmhos
Fluoride	135	23.70	08/01/1990	5.50	06/14/2008	12.29	mg/l
Hardness as CaCO3	135	204.00	02/21/1994	25.00	08/15/2017	87.81	mg/l
Nitrate as N, dissolved	29	0.08	06/26/2002	0.02	06/28/2006	0.05	mg/l
Nitrate/Nitrite as N,	29	0.09	06/16/2011	0.02	06/28/2006	0.06	mg/l
Nitrite as N, dissolved	29	0.04	06/16/2011	0.01	01/29/1991	0.02	mg/l
Nitrogen, Ammonia	28	3.30	08/10/2008	0.83	08/13/1990	1.88	mg/l
Nitrogen, Organic	28	10.10	03/14/2008	0.40	07/21/1993	3.39	mg/l
Nitrogen, Total Kjeldahl	28	12.10	03/14/2008	1.30	06/14/2000	5.03	mg/l
pH, lab	132	9.10	12/14/2021	7.70	09/14/2004	8.57	units
Phosphate, total	26	155.00	06/28/2006	0.06	08/14/1995	17.00	mg/l
Phosphorus, total	28	0.11	08/13/1990	0.02	07/31/1991	0.06	mg/l
SAR in Water	132	4,950.00	06/24/2003	19.00	08/15/2017	127.89	none
Sulfate	134	2,310.00	06/15/2014	4.00	12/16/2004	70.78	mg/l
Sulfide	23	5.80	06/26/2002	0.02	08/10/2008	1.18	mg/l
Total Dissolved Solids	135	8,270.00	02/27/1997	2,110.00	08/15/2017	4,986.16	mg/l
Conductivity, Field	193	13,600.00	11/17/1993	2,900.00	08/01/1990	8,571.89	µmhos
pH, Field	188	9.53	07/29/2009	7.30	10/09/2019	8.52	units
Temperature (°C), Field	136	22.10	07/10/2018	7.40	12/15/2005	12.37	(°C)
Water Level, Field	112	554.90	08/07/2023	516.40	10/01/1990	539.22	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	29	0.80	06/16/2005	0.03	09/21/2010	0.28	mg/l
Arsenic, dissolved	29	0.05	01/29/1991	0.00	06/28/2006	0.01	mg/l
Barium, dissolved	29	1.56	03/14/2008	0.09	08/01/1990	0.85	mg/l
Beryllium, dissolved	29	U	11/27/2012	U	08/10/2008	U	mg/l
Boron, dissolved	135	1.32	08/07/2023	0.10	11/20/1996	0.38	mg/l
Cadmium, dissolved	29	0.03	07/21/1993	0.03	07/21/1993	0.03	mg/l
Calcium, dissolved	135	45.00	12/16/2004	3.00	11/20/1996	10.86	mg/l
Chromium, dissolved	29	U	11/27/2012	U	08/10/2008	U	mg/l
Copper, dissolved	29	0.08	06/24/2004	0.08	06/24/2004	0.08	mg/l
Iron, dissolved	29	1.67	10/25/1990	0.07	09/21/2010	0.39	mg/l
Lead, dissolved	29	U	11/27/2012	U	08/10/2008	U	mg/l
Lithium, dissolved	28	0.10	06/16/1997	0.02	08/13/1990	0.04	mg/l
Magnesium, dissolved	135	37.00	02/21/1994	3.90	08/15/2017	14.70	mg/l
Manganese, dissolved	28	0.15	10/25/1990	0.01	09/21/2010	0.05	mg/l
Mercury, dissolved	29	0.0020	09/15/2007	0.0002	08/14/1995	0.0009	mg/l
Molybdenum, dissolved	29	0.37	08/13/1990	0.13	10/25/1990	0.24	mg/l
Nickel, dissolved	29	U	11/27/2012	U	08/10/2008	U	mg/l
Potassium, dissolved	135	10.00	07/31/1991	1.37	12/14/2020	3.03	mg/l
Selenium, dissolved	29	0.0030	01/29/1991	0.0010	08/13/1990	0.0020	mg/l
Silica, dissolved	135	63.00	12/16/2004	2.10	04/20/1992	12.22	mg/l
Sodium, dissolved	135	3,180.00	02/27/1997	220.00	08/15/2017	1,893.16	mg/l
Strontium, dissolved	135	8.17	02/21/1994	0.30	08/15/2017	3.17	mg/l
Vanadium, dissolved	29	U	11/27/2012	U	08/10/2008	U	mg/l
Zinc, dissolved	29	0.10	07/31/1991	0.01	10/25/1990	0.05	mg/l

Appx. Table A-7: AG-1 Quarterly A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	19	1,410	06/03/2020	198	02/10/2015	740	mg/l
Carbonate as CaCO3	19	275	02/01/2022	53	11/04/2014	194	mg/l
Total Alkalinity as CaCO3	19	1,670	06/03/2020	377	02/10/2015	935	mg/l
Bromide	11	2.38	04/22/2019	0.17	01/29/2015	1.27	mg/l
Cation-Anion Balance	19	2.00	10/05/2022	-6.70	02/10/2015	-2.73	%
Sum of Anions	19	45.00	06/11/2019	15.00	12/15/2015	25.89	meq/l
Sum of Cations	19	42.00	06/11/2019	14.00	02/10/2015	24.42	meq/l
Chemical Oxygen Demand	11	37.00	12/15/2015	10.00	06/11/2019	19.11	mg/l
Chloride	19	435	06/11/2019	92	11/04/2014	185	mg/l
Conductivity, Lab	19	3,800	06/11/2019	1,430	11/04/2014	2,367	µmhos
Fluoride	19	17.50	06/03/2020	5.47	06/19/2018	11.27	mg/l
Hardness as CaCO3	19	80.00	06/11/2019	13.00	06/19/2018	37.96	mg/l
Nitrate as N, dissolved	11	0.02	01/29/2015	0.02	01/29/2015	0.02	mg/l
Nitrate/Nitrite as N,	11	0.03	01/29/2015	0.00	11/04/2014	0.02	mg/l
Nitrite as N, dissolved	11	0.01	01/29/2015	0.00	11/04/2014	0.01	mg/l
Nitrogen, Ammonia	11	1.51	09/28/2017	0.47	04/05/2016	0.84	mg/l
Nitrogen, Organic	11	0.50	01/29/2015	0.10	04/05/2016	0.28	mg/l
Nitrogen, Total Kjeldahl	11	1.90	09/28/2017	0.60	04/05/2016	1.05	mg/l
pH, lab	19	9.70	01/29/2015	8.70	11/04/2014	9.15	units
Phosphate, total	11	1.02	06/03/2020	0.06	06/19/2018	0.38	mg/l
Phosphorus, total	11	0.33	06/03/2020	0.02	06/19/2018	0.12	mg/l
SAR in Water	19	59	06/03/2020	20.00	11/04/2014	39	none
Sulfate	19	210	02/10/2015	10.50	08/14/2023	65	mg/l
Sulfide	11	6.20	06/03/2020	0.04	11/04/2014	2.22	mg/l
Total Dissolved Solids	19	2,400	06/11/2019	843	12/15/2015	1,388	mg/l
Conductivity, Field	17	4,062	04/22/2019	1,432	04/05/2016	2,457	µmhos
pH, Field	17	9.64	06/19/2018	8.44	04/22/2019	8.94	units
Temperature (°C), Field	17	22.22	06/19/2018	10.10	04/25/2023	17.32	(°C)
Water Level, Field	17	581.90	09/28/2017	561.80	04/25/2023	572.15	Ft.
Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Arsenic, dissolved	11	0.00	11/04/2014	0.00	02/10/2015	0.00	mg/l
Barium, dissolved	11	0.41	04/22/2019	0.01	12/15/2015	0.12	mg/l
Beryllium, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Boron, dissolved	19	1.07	06/03/2020	0.21	02/10/2015	0.55	mg/l
Cadmium, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Calcium, dissolved	19	12.20	05/18/2021	1.30	04/05/2016	3.26	mg/l
Chromium, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Copper, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Iron, dissolved	11	0.86	09/28/2017	0.03	11/04/2014	0.25	mg/l
Lead, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Lithium, dissolved	11	0.28	06/11/2019	0.12	11/04/2014	0.17	mg/l
Magnesium, dissolved	19	17.10	06/11/2019	2.40	06/19/2018	7.23	mg/l
Manganese, dissolved	11	0.08	11/04/2014	0.01	04/05/2016	0.03	mg/l
Mercury, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Molybdenum, dissolved	11	0.19	06/19/2018	0.06	11/04/2014	0.13	mg/l
Nickel, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Potassium, dissolved	19	11.30	06/19/2018	0.98	02/13/2023	4.19	mg/l
Selenium, dissolved	11	0.01	05/18/2021	0.00	09/28/2017	0.00	mg/l
Silica, dissolved	19	13.90	11/04/2014	0.20	02/10/2015	9.28	mg/l
Sodium, dissolved	19	924	06/11/2019	303	02/10/2015	531	mg/l
Strontium, dissolved	19	1.93	06/11/2019	0.23	12/15/2015	0.85	mg/l
Vanadium, dissolved	11	U	06/03/2020	U	11/04/2014	U	mg/l
Zinc, dissolved	11	0.61	05/18/2021	0.01	11/04/2014	0.23	mg/l

Appx. Table A-8: AG-2 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	6	441	08/17/2021	308	11/12/2021	379	mg/l
Carbonate as CaCO3	6	283	11/12/2021	80	08/17/2021	168	mg/l
Total Alkalinity as CaCO3	6	592	11/12/2021	513	09/03/2021	547	mg/l
Bromide	5	U	08/17/2021	U	09/10/2021	U	mg/l
Cation-Anion Balance	6	3.20	09/03/2021	-3.40	03/14/2022	-0.53	%
Sum of Anions	6	17.00	09/10/2021	13.00	08/17/2021	15.00	meq/l
Sum of Cations	6	17.00	09/10/2021	13.00	08/17/2021	14.83	meq/l
Chemical Oxygen Demand	5	35.00	09/03/2021	25.00	09/10/2021	29.33	mg/l
Chloride	6	32	09/10/2021	13	02/13/2023	23	mg/l
Conductivity, Lab	6	1,620	11/12/2021	1,200	02/13/2023	1,392	µmhos
Fluoride	6	10.90	02/13/2023	9.31	09/10/2021	10.06	mg/l
Hardness as CaCO3	6	60.00	08/17/2021	40.00	09/03/2021	49.83	mg/l
Nitrate as N, dissolved	5	UH	08/17/2021	UH	09/10/2021	UH	mg/l
Nitrate/Nitrite as N,	5	UH	08/17/2021	UH	09/10/2021	UH	mg/l
Nitrite as N, dissolved	5	UH	08/17/2021	UH	09/10/2021	UH	mg/l
Nitrogen, Ammonia	5	0.91	09/03/2021	0.39	08/17/2021	0.66	mg/l
Nitrogen, Organic	5	0.59	09/10/2021	0.31	09/03/2021	0.46	mg/l
Nitrogen, Total Kjeldahl	5	1.36	09/10/2021	0.60	02/13/2023	0.97	mg/l
pH, lab	6	9.80	09/10/2021	8.70	02/13/2023	9.28	units
Phosphate, total	5	1.45	09/03/2021	0.18	02/13/2023	0.70	mg/l
Phosphorus, total	5	0.47	09/03/2021	0.06	02/13/2023	0.23	mg/l
SAR in Water	6	23	09/03/2021	15.00	08/17/2021	19	none
Sulfate	6	190	11/12/2021	73.90	02/13/2023	137	mg/l
Sulfide	5	2.73	09/10/2021	0.10	08/17/2021	0.99	mg/l
Total Dissolved Solids	6	971	09/10/2021	727	02/13/2023	847	mg/l
Conductivity, Field	9	1,561	09/10/2021	1,020	08/11/2021	1,243	µmhos
pH, Field	9	9.71	09/03/2021	7.44	08/11/2021	8.59	units
Temperature (°C),	9	28.10	08/11/2021	10.10	02/13/2023	17.98	(°C)
Water Level, Field	11	374.60	11/13/2023	368.70	09/03/2021	370.80	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	5	0.09	08/17/2021	0.09	08/17/2021	0.09	mg/l
Arsenic, dissolved	5	0.45	09/10/2021	0.06	08/17/2021	0.21	mg/l
Barium, dissolved	5	0.07	09/10/2021	0.02	08/17/2021	0.05	mg/l
Beryllium, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Boron, dissolved	6	0.26	09/10/2021	0.24	02/13/2023	0.25	mg/l
Cadmium, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Calcium, dissolved	6	11.30	08/17/2021	4.84	09/03/2021	7.24	mg/l
Chromium, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Copper, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Iron, dissolved	5	0.30	08/17/2021	0.17	09/03/2021	0.25	mg/l
Lead, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Lithium, dissolved	5	0.11	09/03/2021	0.07	02/13/2023	0.09	mg/l
Magnesium, dissolved	6	8.79	11/12/2021	6.64	02/13/2023	7.68	mg/l
Manganese, dissolved	5	0.05	08/17/2021	0.05	08/17/2021	0.05	mg/l
Mercury, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Molybdenum, dissolved	5	0.69	09/10/2021	0.04	02/13/2023	0.35	mg/l
Nickel, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Potassium, dissolved	6	30.30	09/03/2021	1.21	02/13/2023	14.96	mg/l
Selenium, dissolved	5	0.0028	08/17/2021	0.0003	09/10/2021	0.0012	mg/l
Silica, dissolved	6	13.40	08/17/2021	6.40	09/03/2021	8.92	mg/l
Sodium, dissolved	6	342	09/10/2021	269	02/13/2023	303	mg/l
Strontium, dissolved	6	1.07	11/12/2021	0.77	08/17/2021	0.93	mg/l
Vanadium, dissolved	5	U	08/17/2021	U	09/10/2021	U	mg/l
Zinc, dissolved	5	0.62	09/10/2021	0.30	03/14/2022	0.46	mg/l

Appx. Table A-9: MMC-IRI-4 Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	63	1,250.00	03/22/1993	34.00	09/08/1993	292.94	mg/l
Carbonate as CaCO3	63	870.00	03/22/1993	24.00	06/30/2009	250.69	mg/l
Total Alkalinity as CaCO3	63	2,120.00	03/22/1993	176.00	06/14/2008	498.19	mg/l
Bromide	33	2.70	11/29/2011	0.07	05/26/2000	0.62	mg/l
Cation-Anion Balance	61	13.30	11/06/2014	-9.10	03/22/2016	1.47	%
Sum of Anions	61	19.49	09/16/1991	9.50	05/29/2003	13.34	meq/l
Sum of Cations	61	18.34	09/16/1991	9.50	05/26/2004	13.78	meq/l
Chemical Oxygen Demand	31	1,300.00	05/29/2002	12.00	03/15/2022	417.35	mg/l
Chloride	63	252.00	06/14/2008	21.00	12/20/1993	112.64	mg/l
Conductivity, Lab	62	3,320.00	09/15/1992	1,010.00	05/29/2003	1,508.87	µmhos
Fluoride	63	27.00	12/19/1995	2.20	09/15/1992	9.63	mg/l
Hardness as CaCO3	63	962.00	03/22/1993	0.00	01/19/1994	33.20	mg/l
Nitrate as N, dissolved	33	3.89	06/14/2008	0.02	09/15/1992	0.43	mg/l
trate/Nitrite as N, dissolved	33	3.90	06/14/2008	0.02	09/15/1992	0.33	mg/l
Nitrite as N, dissolved	33	0.05	11/06/2014	0.01	06/18/1996	0.02	mg/l
Nitrogen, Ammonia	33	21.30	09/08/1993	0.34	08/23/2017	3.44	mg/l
Nitrogen, Organic	33	104.00	05/29/2002	0.20	08/23/2017	17.23	mg/l
Nitrogen, Total Kjeldahl	33	106.00	05/29/2002	0.40	04/22/2019	18.14	mg/l
pH, lab	62	11.90	06/16/1992	8.50	02/12/2023	10.10	units
Phosphate, total	33	155.00	07/29/2009	0.03	05/26/1999	6.27	mg/l
Phosphorus, total	33	2.95	09/27/1990	0.01	05/26/1999	0.23	mg/l
SAR in Water	54	190.00	11/14/1997	3.83	03/25/1992	62.31	none
Sulfate	63	360.00	09/16/1991	0.80	02/26/1997	31.18	mg/l
Sulfide	33	29.00	03/22/2016	0.02	09/15/1992	4.28	mg/l
Total Dissolved Solids	62	2,752.00	03/22/1993	578.00	09/27/1990	845.25	mg/l
Conductivity, Field	80	3,910.00	07/29/2009	694.00	06/01/2005	1,585.90	µmhos
pH, Field	79	12.90	09/13/1995	7.78	09/16/2019	10.59	units
Temperature (°C), Field	40	22.50	06/01/2005	7.00	07/01/1991	12.34	(°C)
Water Level, Field	70	494.90	09/08/2022	409.63	11/01/1990	438.91	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	33	1.35	11/06/2014	0.03	08/23/2017	0.22	mg/l
Arsenic, dissolved	33	0.01	08/23/2017	0.00	03/15/2022	0.00	mg/l
Barium, dissolved	33	0.20	07/29/2009	0.00	09/08/1993	0.05	mg/l
Beryllium, dissolved	33	0.00	U	44,635.00	U	38,133.00	mg/l
Boron, dissolved	63	0.47	12/20/1993	0.04	03/09/2020	0.22	mg/l
Cadmium, dissolved	33	0.00	U	44,635.00	U	38,133.00	mg/l
Calcium, dissolved	63	27.50	06/30/2009	0.20	11/14/1997	4.13	mg/l
Chromium, dissolved	33	0.02	11/06/2014	0.01	06/23/1994	0.01	mg/l
Copper, dissolved	33	0.04	07/29/2009	0.01	07/30/1991	0.03	mg/l
Iron, dissolved	33	65.10	11/06/2014	0.01	06/30/1995	2.94	mg/l
Lead, dissolved	33	0.63	09/15/2010	0.02	06/23/1994	0.14	mg/l
Lithium, dissolved	33	0.17	09/27/1990	0.02	03/08/2021	0.06	mg/l
Magnesium, dissolved	63	5.00	09/27/1990	U	05/24/2005	1.50	mg/l
Manganese, dissolved	33	0.59	11/06/2014	0.01	07/29/2009	0.06	mg/l
Mercury, dissolved	33	0.0007	07/30/1991	0.0001	09/27/1990	0.0004	mg/l
Molybdenum, dissolved	33	0.13	05/24/2005	0.01	05/09/2001	0.05	mg/l
Nickel, dissolved	33	0.03	09/15/1992	0.01	03/22/2016	0.01	mg/l
Potassium, dissolved	63	39.00	03/22/1993	0.42	02/12/2023	5.64	mg/l
Selenium, dissolved	33	0.0010	07/30/1991	0.0003	02/12/2023	0.0007	mg/l
Silica, dissolved	63	44.60	06/16/1992	1.30	03/09/2020	15.73	mg/l
Sodium, dissolved	63	567.00	03/22/1993	153.00	03/25/1992	303.86	mg/l
Strontium, dissolved	63	5.10	03/25/1992	0.01	04/21/1994	0.33	mg/l
Vanadium, dissolved	33	0.01	06/23/1994	0.01	05/26/2000	0.01	mg/l
Zinc, dissolved	33	0.61	11/06/2014	0.01	09/27/1990	0.09	mg/l

Appx. Table A-10: O-GMW-A Annual A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	1	528.00	10/05/2014	528.00	10/05/2014	528.00	mg/l
Carbonate as CaCO3	1	51.40	10/05/2014	51.40	10/05/2014	51.40	mg/l
Total Alkalinity as CaCO3	1	579.00	10/05/2014	579.00	10/05/2014	579.00	mg/l
Bromide	1	U	10/05/2014	U	10/05/2014	U	mg/l
Cation-Anion Balance	1	-3.70	10/05/2014	-3.70	10/05/2014	-3.70	%
Sum of Anions	1	14.00	10/05/2014	14.00	10/05/2014	14.00	meq/l
Sum of Cations	1	13.00	10/05/2014	13.00	10/05/2014	13.00	meq/l
Chemical Oxygen Demand	1	U	10/05/2014	U	10/05/2014	U	mg/l
Chloride	1	18.60	10/05/2014	18.60	10/05/2014	18.60	mg/l
Conductivity, Lab	1	1,270.00	10/05/2014	1,270.00	10/05/2014	1,270.00	µmhos
Fluoride	1	16.40	10/05/2014	16.40	10/05/2014	16.40	mg/l
Hardness as CaCO3	1	46.00	10/05/2014	46.00	10/05/2014	46.00	mg/l
Nitrate as N, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Nitrate/Nitrite as N,	1	U	10/05/2014	U	10/05/2014	U	mg/l
Nitrite as N, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Nitrogen, Ammonia	1	0.40	10/05/2014	0.40	10/05/2014	0.40	mg/l
Nitrogen, Organic	1	0.30	10/05/2014	0.30	10/05/2014	0.30	mg/l
Nitrogen, Total Kjeldahl	1	0.70	10/05/2014	0.70	10/05/2014	0.70	mg/l
pH, lab	1	8.60	10/05/2014	8.60	10/05/2014	8.60	units
Phosphate, total	1	0.06	10/05/2014	0.06	10/05/2014	0.06	mg/l
Phosphorus, total	1	0.02	10/05/2014	0.02	10/05/2014	0.02	mg/l
SAR in Water	1	17.00	10/05/2014	17.00	10/05/2014	17.00	none
Sulfate	1	60.00	10/05/2014	60.00	10/05/2014	60.00	mg/l
Sulfide	1	0.03	10/05/2014	0.03	10/05/2014	0.03	mg/l
Total Dissolved Solids	1	746.00	10/05/2014	746.00	10/05/2014	746.00	mg/l
Conductivity, Field	0	N/A	N/A	N/A	N/A	N/A	µmhos
pH, Field	0	N/A	N/A	N/A	N/A	N/A	units
Temperature (°C), Field	0	N/A	N/A	N/A	N/A	N/A	(°C)
Water Level, Field	0	N/A	N/A	N/A	N/A	N/A	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Arsenic, dissolved	1	0.02	10/05/2014	0.02	10/05/2014	0.02	mg/l
Barium, dissolved	1	0.13	10/05/2014	U	10/05/2014	0.13	mg/l
Beryllium, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Boron, dissolved	1	0.25	10/05/2014	0.25	10/05/2014	0.25	mg/l
Cadmium, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Calcium, dissolved	1	6.00	10/05/2014	U	10/05/2014	6.00	mg/l
Chromium, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Copper, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Iron, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Lead, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Lithium, dissolved	1	0.12	10/05/2014	0.12	10/05/2014	0.12	mg/l
Magnesium, dissolved	1	7.40	10/05/2014	U	10/05/2014	7.40	mg/l
Manganese, dissolved	1	0.01	10/05/2014	U	10/05/2014	0.01	mg/l
Mercury, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Molybdenum, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Nickel, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Potassium, dissolved	1	1.30	10/05/2014	1.30	10/05/2014	1.30	mg/l
Selenium, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Silica, dissolved	1	11.80	10/05/2014	11.80	10/05/2014	11.80	mg/l
Sodium, dissolved	1	267.00	10/05/2014	267.00	10/05/2014	267.00	mg/l
Strontium, dissolved	1	1.16	10/05/2014	U	10/05/2014	1.16	mg/l
Vanadium, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l
Zinc, dissolved	1	U	10/05/2014	U	10/05/2014	U	mg/l

Appx. Table A-11: WSW-2 Quarterly A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	62	4,070.00	11/29/2022	483.00	06/16/2014	1,903.94	mg/l
Carbonate as CaCO3	62	636.00	03/03/2021	42.60	11/10/2014	162.75	mg/l
Total Alkalinity as CaCO3	62	4,410.00	11/29/2022	534.00	06/16/2014	2,062.60	mg/l
Bromide	5	0.46	07/11/2013	0.03	10/04/2011	0.18	mg/l
Cation-Anion Balance	61	38.70	05/09/2022	-13.40	06/14/2011	-2.45	%
Sum of Anions	62	137.00	11/29/2022	13.70	10/04/2011	60.92	meq/l
Sum of Cations	62	136.00	11/07/2023	12.60	06/14/2011	58.02	meq/l
Chemical Oxygen Demand	12	91.00	04/07/2021	10.00	01/20/2011	29.25	mg/l
Chloride	62	1,910.00	07/03/2019	11.00	06/14/2011	678.53	mg/l
Conductivity, Lab	63	11,600	11/29/2022	1,250	10/04/2011	5,370	µmhos
Fluoride	62	28.10	11/14/2018	13.80	09/17/2012	20.53	mg/l
Hardness as CaCO3	62	72.00	01/24/2018	14.00	11/30/2011	34.77	mg/l
Nitrate as N, dissolved	3	0.10	11/10/2014	0.02	04/07/2021	0.06	mg/l
Nitrate/Nitrite as N,	3	0.10	11/10/2014	0.02	04/07/2021	0.06	mg/l
Nitrite as N, dissolved	0	U	11/10/2014	U	04/07/2021	U	mg/l
Nitrogen, Ammonia	16	2.26	05/01/2023	0.39	10/04/2011	1.10	mg/l
Nitrogen, Organic	13	0.90	04/03/2019	0.10	03/23/2011	0.35	mg/l
Nitrogen, Total Kjeldahl	16	3.03	05/01/2023	0.60	03/30/2011	1.37	mg/l
pH, lab	63	8.90	03/16/2014	8.50	05/14/2018	8.68	units
Phosphate, total	16	2.96	05/01/2023	0.09	03/23/2011	0.94	mg/l
Phosphorus, total	16	0.96	05/01/2023	0.03	03/23/2011	0.30	mg/l
SAR in Water	62	190.00	11/29/2022	31.30	06/14/2011	88.61	none
Sulfate	51	156.00	09/11/2019	5.41	07/17/2018	35.04	mg/l
Sulfide	16	4.34	05/01/2023	1.41	01/24/2018	2.63	mg/l
Total Dissolved Solids	62	7,280.00	11/29/2022	740.00	11/30/2011	3,278.92	mg/l
Conductivity, Field	146	11,760	01/16/2023	719	03/23/2011	5,421	µmhos
pH, Field	118	9.10	06/15/2020	7.30	05/28/2015	8.28	units
Temperature (°C), Field	118	25.00	07/13/2016	16.35	05/17/2016	21.95	(°C)
Water Level, Field	N/A	N/A	N/A	N/A	N/A	N/A	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	16	0.05	03/23/2011	0.03	11/05/2015	0.04	mg/l
Arsenic, dissolved	16	0.0004	03/23/2017	0.0002	11/05/2015	0.0003	mg/l
Barium, dissolved	16	1.53	04/03/2019	0.03	01/24/2018	0.49	mg/l
Beryllium, dissolved	16	0.0020	01/20/2011	0.0020	01/20/2011	0.0020	mg/l
Boron, dissolved	62	3.32	11/07/2023	0.36	10/04/2011	1.43	mg/l
Cadmium, dissolved	16	U	05/09/2022	U	10/04/2011	U	mg/l
Calcium, dissolved	62	14.10	01/24/2018	1.70	05/14/2019	3.19	mg/l
Chromium, dissolved	16	0.02	04/06/2016	0.02	04/06/2016	0.02	mg/l
Copper, dissolved	16	U	05/09/2022	U	10/04/2011	U	mg/l
Iron, dissolved	16	1.71	05/01/2023	0.05	03/23/2011	0.44	mg/l
Lead, dissolved	16	U	05/09/2022	U	10/04/2011	U	mg/l
Lithium, dissolved	16	0.27	05/09/2022	0.06	01/20/2011	0.13	mg/l
Magnesium, dissolved	62	13.00	04/10/2018	2.00	01/20/2011	6.52	mg/l
Manganese, dissolved	16	0.05	04/03/2019	0.01	03/23/2011	0.02	mg/l
Mercury, dissolved	16	U	05/09/2022	U	10/04/2011	U	mg/l
Molybdenum, dissolved	16	U	05/09/2022	U	10/04/2011	U	mg/l
Nickel, dissolved	16	0.02	07/11/2013	0.01	03/23/2011	0.02	mg/l
Potassium, dissolved	62	7.00	02/11/2020	0.40	11/01/2012	1.62	mg/l
Selenium, dissolved	16	0.0007	05/09/2022	0.0007	05/09/2022	0.0007	mg/l
Silica, dissolved	62	12.80	11/05/2015	9.00	01/24/2018	11.43	mg/l
Sodium, dissolved	62	3,060.00	11/07/2023	279.00	06/14/2011	1,300.21	mg/l
Strontium, dissolved	62	2.67	01/24/2018	0.44	06/14/2011	1.39	mg/l
Vanadium, dissolved	16	U	05/09/2022	U	10/04/2011	U	mg/l
Zinc, dissolved	16	0.07	04/03/2019	0.01	11/05/2015	0.03	mg/l

Appx. Table A-12: WSW-3 Quarterly A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	41	572.00	11/07/2023	459.00	07/17/2018	492.93	mg/l
Carbonate as CaCO3	41	86.10	04/03/2019	26.70	04/06/2016	56.28	mg/l
Total Alkalinity as CaCO3	41	649.00	11/07/2023	518.00	03/03/2021	549.24	mg/l
Bromide	6	1.54	03/23/2017	0.10	08/22/2014	0.94	mg/l
Cation-Anion Balance	41	13.30	01/24/2018	-7.70	07/08/2020	-1.28	%
Sum of Anions	41	17.00	11/07/2023	12.00	10/18/2016	13.34	meq/l
Sum of Cations	41	17.00	01/24/2018	12.00	08/22/2014	13.02	meq/l
Chemical Oxygen	3	196.00	04/06/2016	11.00	05/09/2022	76.33	mg/l
Chloride	41	89.80	11/07/2023	11.60	08/27/2015	21.30	mg/l
Conductivity, Lab	41	1,590	11/07/2023	1,100	08/16/2016	1,214	µmhos
Fluoride	41	19.80	08/22/2014	13.80	08/01/2023	17.78	mg/l
Hardness as CaCO3	41	238.00	01/24/2018	12.00	06/27/2017	19.38	mg/l
Nitrate as N, dissolved	1	0.09	08/22/2014	0.09	08/22/2014	0.09	mg/l
Nitrate/Nitrite as N,	1	0.25	08/22/2014	0.25	08/22/2014	0.25	mg/l
Nitrite as N, dissolved	1	0.16	08/22/2014	0.16	08/22/2014	0.16	mg/l
Nitrogen, Ammonia	10	0.60	05/09/2022	0.43	04/06/2016	0.47	mg/l
Nitrogen, Organic	3	0.40	08/22/2014	0.30	04/03/2019	0.37	mg/l
Nitrogen, Total Kjeldahl	9	0.80	08/22/2014	0.30	01/24/2018	0.59	mg/l
pH, lab	41	9.30	10/10/2019	8.40	11/29/2022	8.72	units
Phosphate, total	10	0.12	08/22/2014	0.05	05/09/2022	0.08	mg/l
Phosphorus, total	10	0.04	08/22/2014	0.02	05/09/2022	0.03	mg/l
SAR in Water	41	37.00	09/10/2019	7.60	01/24/2018	33.19	none
Sulfate	39	57.90	04/06/2016	11.60	01/27/2016	37.54	mg/l
Sulfide	10	6.93	05/09/2022	0.16	08/22/2014	2.38	mg/l
Total Dissolved Solids	41	947.00	11/07/2023	661.00	08/27/2015	716.66	mg/l
Conductivity, Field	100	1,633	12/04/2023	632	02/21/2019	1,230	µmhos
pH, Field	100	8.90	03/16/2016	7.60	04/06/2016	8.41	units
Temperature (°C), Field	100	23.40	07/17/2017	14.85	02/11/2020	21.41	(°C)
Water Level, Field	N/A	N/A	N/A	N/A	N/A	N/A	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	10	0.04	01/24/2018	0.00	08/22/2014	0.02	mg/l
Arsenic, dissolved	10	0.05	08/22/2014	0.00	03/23/2017	0.01	mg/l
Barium, dissolved	10	0.31	05/01/2023	0.03	01/24/2018	0.21	mg/l
Beryllium, dissolved	10	U	08/22/2014	U	08/22/2014	U	mg/l
Boron, dissolved	41	0.27	11/07/2023	0.21	04/06/2016	0.24	mg/l
Cadmium, dissolved	10	U	08/22/2014	U	08/22/2014	U	mg/l
Calcium, dissolved	40	3.40	08/22/2014	2.20	03/23/2017	2.53	mg/l
Chromium, dissolved	10	U	08/22/2014	U	08/22/2014	U	mg/l
Copper, dissolved	10	U	08/22/2014	U	08/22/2014	U	mg/l
Iron, dissolved	10	0.74	05/01/2023	0.05	03/23/2017	0.17	mg/l
Lead, dissolved	10	U	08/22/2014	U	08/22/2014	U	mg/l
Lithium, dissolved	10	0.13	04/06/2016	0.06	08/22/2014	0.07	mg/l
Magnesium, dissolved	40	3.10	11/07/2023	1.40	09/10/2019	1.80	mg/l
Manganese, dissolved	10	0.03	08/22/2014	0.01	04/06/2016	0.02	mg/l
Mercury, dissolved	10	U	08/22/2014	U	08/22/2014	U	mg/l
Molybdenum, dissolved	10	0.16	01/24/2018	0.07	08/22/2014	0.12	mg/l
Nickel, dissolved	10	0.01	04/06/2016	U	08/22/2014	0.01	mg/l
Potassium, dissolved	41	29.20	04/06/2016	0.20	10/18/2016	1.32	mg/l
Selenium, dissolved	10	0.0035	04/07/2021	0.0003	01/24/2018	0.0017	mg/l
Silica, dissolved	41	13.50	07/08/2020	10.80	05/01/2023	12.49	mg/l
Sodium, dissolved	41	382.00	11/07/2023	258.00	05/14/2018	283.05	mg/l
Strontium, dissolved	41	0.90	11/07/2023	0.45	01/24/2018	0.56	mg/l
Vanadium, dissolved	10	U	08/22/2014	U	08/22/2014	U	mg/l
Zinc, dissolved	10	0.36	01/24/2018	0.02	08/22/2014	0.19	mg/l

Appx. Table A-13: WSW-4 Quarterly A-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	42	524.00	04/07/2021	439.00	08/27/2015	480.88	mg/l
Carbonate as CaCO3	43	537.00	09/25/2014	46.10	01/13/2020	75.56	mg/l
Total Alkalinity as	43	925.00	09/25/2014	511.00	06/09/2015	554.33	mg/l
Bromide	6	1.91	05/09/2022	0.09	08/25/2014	0.73	mg/l
Cation-Anion Balance	42	3.70	01/24/2018	-7.70	07/08/2020	-2.43	%
Sum of Anions	43	22.00	09/25/2014	13.00	06/09/2015	13.63	meq/l
Sum of Cations	43	19.00	09/25/2014	12.00	08/27/2015	12.98	meq/l
Chemical Oxygen	4	53.00	08/25/2014	13.00	04/06/2016	31.25	mg/l
Chloride	43	50.60	11/14/2018	7.87	10/05/2020	17.43	mg/l
Conductivity, Lab	43	2,810	09/25/2014	1,130	04/06/2016	1,250	µmhos
Fluoride	43	19.70	11/14/2018	5.11	09/25/2014	16.48	mg/l
Hardness as CaCO3	43	67.00	01/24/2018	11.00	03/05/2019	13.82	mg/l
Nitrate as N, dissolved	2	0.03	08/25/2014	0.00	09/25/2014	0.02	mg/l
Nitrate/Nitrite as N,	2	0.08	08/25/2014	0.00	09/25/2014	0.04	mg/l
Nitrite as N, dissolved	2	0.05	08/25/2014	0.01	09/25/2014	0.03	mg/l
Nitrogen, Ammonia	11	2.28	09/25/2014	0.35	05/01/2023	0.64	mg/l
Nitrogen, Organic	4	0.40	04/03/2019	0.00	09/25/2014	0.25	mg/l
Nitrogen, Total Kjeldahl	11	1.00	09/25/2014	0.30	03/23/2017	0.60	mg/l
pH, lab	43	11.70	09/25/2014	8.50	10/05/2020	8.83	units
Phosphate, total	11	0.28	09/25/2014	0.06	05/09/2022	0.10	mg/l
Phosphorus, total	11	0.09	09/25/2014	0.02	05/09/2022	0.03	mg/l
SAR in Water	43	44.00	09/25/2014	15.00	01/24/2018	35.09	none
Sulfate	43	130.00	09/25/2014	20.00	04/06/2016	52.41	mg/l
Sulfide	11	4.10	04/03/2019	0.10	09/25/2014	2.39	mg/l
Total Dissolved Solids	43	1,210.00	09/25/2014	687.00	08/15/2022	731.19	mg/l
Conductivity, Field	101	1,558	10/10/2019	1,073	04/06/2016	1,227	µmhos
pH, Field	101	9.40	01/13/2020	7.70	08/27/2015	8.53	units
Temperature (°C), Field	101	29.00	06/20/2016	13.80	04/19/2017	21.42	(°C)
Water Level, Field	N/A	N/A	N/A	N/A	N/A	N/A	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	11	0.42	09/25/2014	U	09/25/2014	U	mg/l
Arsenic, dissolved	11	0.0052	09/25/2014	0.0003	04/07/2021	0.0024	mg/l
Barium, dissolved	11	0.23	04/06/2016	0.02	09/25/2014	0.09	mg/l
Beryllium, dissolved	11	U	04/06/2016	U	09/25/2014	U	mg/l
Boron, dissolved	43	0.44	09/25/2014	0.18	08/27/2015	0.21	mg/l
Cadmium, dissolved	11	U	04/06/2016	U	09/25/2014	U	mg/l
Calcium, dissolved	43	24.70	01/24/2018	1.89	11/07/2023	2.73	mg/l
Chromium, dissolved	11	U	04/06/2016	U	09/25/2014	U	mg/l
Copper, dissolved	11	U	04/06/2016	U	09/25/2014	U	mg/l
Iron, dissolved	11	1.63	04/03/2019	0.02	03/23/2017	0.33	mg/l
Lead, dissolved	11	U	04/06/2016	U	09/25/2014	U	mg/l
Lithium, dissolved	11	0.14	04/07/2021	0.07	04/06/2016	0.12	mg/l
Magnesium, dissolved	43	2.00	08/27/2015	0.30	09/25/2014	1.70	mg/l
Manganese, dissolved	11	0.01	01/24/2018	U	09/25/2014	U	mg/l
Mercury, dissolved	11	U	04/06/2016	U	09/25/2014	U	mg/l
Molybdenum, dissolved	11	0.04	01/24/2018	0.02	09/25/2014	0.03	mg/l
Nickel, dissolved	11	0.00	08/25/2014	0.00	08/25/2014	0.00	mg/l
Potassium, dissolved	43	18.30	09/25/2014	0.20	05/14/2018	0.96	mg/l
Selenium, dissolved	11	0.0042	04/07/2021	0.0003	04/03/2019	0.0012	mg/l
Silica, dissolved	43	172.00	09/25/2014	8.90	01/24/2018	15.54	mg/l
Sodium, dissolved	43	416.00	09/25/2014	262.00	07/08/2020	285.56	mg/l
Strontium, dissolved	43	7.97	01/24/2018	0.39	03/05/2019	0.60	mg/l
Vanadium, dissolved	11	U	04/06/2016	U	09/25/2014	U	mg/l
Zinc, dissolved	11	0.02	09/25/2014	U	09/25/2014	U	mg/l

Appx. Table A-14: 89-1 Quarterly B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	195	762.00	03/25/1994	144.00	07/30/1990	611.66	mg/l
Carbonate as CaCO3	195	406.00	05/21/1997	25.00	07/01/1997	99.74	mg/l
Total Alkalinity as CaCO3	195	830.00	07/31/1991	200.00	07/30/1990	711.55	mg/l
Bromide	28	10.00	06/26/1991	0.06	07/01/1997	1.15	mg/l
Cation-Anion Balance	190	24.10	04/16/2002	-10.30	01/13/2021	-0.30	%
Sum of Anions	189	18.00	06/14/2017	4.29	07/30/1990	15.73	meq/l
Sum of Cations	189	18.20	04/11/2006	4.38	07/30/1990	15.44	meq/l
Chemical Oxygen	30	420.00	06/25/2007	30.00	03/30/1990	81.41	mg/l
Chloride	194	70.50	06/14/2017	6.00	09/27/1990	15.17	mg/l
Conductivity, Lab	187	1,850.00	04/24/1991	1,000.00	05/20/1993	1,391.97	µmhos
Fluoride	189	38.20	02/24/1992	0.20	09/29/1994	23.75	mg/l
Hardness as CaCO3	193	65.00	09/27/1990	0.00	07/30/1990	11.20	mg/l
Nitrate as N, dissolved	30	16.50	06/25/2007	0.02	06/26/1991	1.01	mg/l
Nitrate/Nitrite as N,	30	17.00	06/25/2007	0.02	06/26/1991	1.07	mg/l
Nitrite as N, dissolved	31	0.55	06/25/2007	0.01	03/30/1990	0.13	mg/l
Nitrogen, Ammonia	30	9.23	12/26/2018	0.06	07/30/1990	1.85	mg/l
Nitrogen, Organic	29	29.10	06/26/1991	0.10	06/15/1992	5.08	mg/l
Nitrogen, Total Kjeldahl	30	30.10	06/26/1991	0.80	06/15/1992	6.81	mg/l
pH, lab	190	9.80	12/20/1994	8.10	10/28/2002	8.88	units
Phosphate, total	26	155.00	06/25/2007	0.06	07/18/1995	13.46	mg/l
Phosphorus, total	31	2.90	09/27/1990	0.02	07/02/1998	0.17	mg/l
SAR in Water	165	158.62	06/26/1990	16.50	09/27/1990	48.20	none
Sulfate	193	140.00	10/25/1990	0.00	08/16/2017	20.10	mg/l
Sulfide	26	2.10	07/30/1990	0.02	07/27/2001	0.45	mg/l
Total Dissolved Solids	195	1,100.00	10/21/1989	446.00	07/30/1990	862.32	mg/l
Conductivity, Field	212	1,683.00	06/05/2012	925.00	08/02/2006	1,343.32	µmhos
pH, Field	212	10.12	07/29/2009	7.10	06/10/2020	9.00	units
Temperature (°C), Field	118	19.00	07/31/1991	7.60	04/01/2006	12.54	(°C)
Water Level, Field	102	500.70	06/25/2014	432.37	06/25/2014	473.23	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	30	1.54	03/30/1990	0.04	07/01/1997	0.24	mg/l
Arsenic, dissolved	30	0.30	10/21/1989	0.00	12/03/2012	0.02	mg/l
Barium, dissolved	30	0.43	08/02/2006	0.02	12/26/2018	0.18	mg/l
Beryllium, dissolved	29	0.01	06/26/1991	0.01	06/26/1991	0.01	mg/l
Boron, dissolved	190	3.30	03/25/1991	0.35	01/27/2004	0.68	mg/l
Cadmium, dissolved	29	0.01	10/21/1989	U	07/15/2004	U	mg/l
Calcium, dissolved	187	13.00	09/27/1990	0.50	03/16/2010	2.30	mg/l
Chromium, dissolved	29	0.01	06/26/1991	U	07/15/2004	U	mg/l
Copper, dissolved	30	0.02	06/25/2007	0.01	03/30/1990	0.01	mg/l
Iron, dissolved	30	0.93	03/30/1990	0.01	07/07/1999	0.17	mg/l
Lead, dissolved	29	0.10	10/21/1989	0.02	06/26/1991	0.06	mg/l
Lithium, dissolved	29	0.20	12/27/1990	0.06	03/30/1990	0.13	mg/l
Magnesium, dissolved	189	8.00	09/27/1990	0.30	03/16/2010	1.38	mg/l
Manganese, dissolved	29	0.07	06/25/2007	0.01	07/01/1997	0.03	mg/l
Mercury, dissolved	30	0.00	06/15/1992	0.00	06/26/1991	0.00	mg/l
Molybdenum, dissolved	29	0.60	10/21/1989	0.01	07/27/2001	0.14	mg/l
Nickel, dissolved	30	0.03	10/21/1989	0.01	12/03/2012	0.02	mg/l
Potassium, dissolved	189	13.00	03/25/1991	0.60	06/10/2020	1.27	mg/l
Selenium, dissolved	30	0.00	10/21/1989	U	07/15/2004	U	mg/l
Silica, dissolved	190	35.90	10/21/1989	1.80	06/11/2019	16.83	mg/l
Sodium, dissolved	190	408.00	04/11/2006	102.00	12/27/1990	348.25	mg/l
Strontium, dissolved	190	0.83	03/14/2012	0.06	10/21/1989	0.50	mg/l
Vanadium, dissolved	30	0.03	06/26/1991	0.01	10/21/1989	0.02	mg/l
Zinc, dissolved	30	0.07	07/29/2009	0.01	03/30/1990	0.02	mg/l

Appx. Table A-15: 90-3 Quarterly B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	134	1,790.00	09/14/2004	419.00	03/23/2005	769.04	mg/l
Carbonate as CaCO3	134	419.00	03/23/2005	4.00	06/16/1997	88.97	mg/l
Total Alkalinity as CaCO3	134	1,790.00	09/14/2004	680.00	06/15/2014	854.71	mg/l
Bromide	14	1.50	07/21/1992	0.10	01/29/1991	0.44	mg/l
Cation-Anion Balance	133	36.90	08/10/2008	-33.50	09/14/2004	-1.68	%
Sum of Anions	124	37.50	09/14/2004	15.00	06/26/2002	18.96	meq/l
Sum of Cations	124	39.50	08/10/2008	11.10	11/23/2010	18.24	meq/l
Chemical Oxygen Demand	21	210.00	09/15/2007	10.00	08/14/1995	75.00	mg/l
Chloride	134	293.00	06/14/2008	9.75	01/16/2018	24.38	mg/l
Conductivity, Lab	131	2,200.00	05/16/2007	1,280.00	07/21/1992	1,602.17	µmhos
Fluoride	134	98.00	03/24/1999	9.00	12/11/2001	22.96	mg/l
Hardness as CaCO3	130	47.00	10/09/2019	1.00	10/25/1990	15.13	mg/l
Nitrate as N, dissolved	26	0.27	06/24/2004	0.04	01/29/1991	0.11	mg/l
Nitrate/Nitrite as N,	26	0.27	06/24/2004	0.05	01/29/1991	0.12	mg/l
Nitrite as N, dissolved	26	0.03	08/16/1994	0.01	01/29/1991	0.02	mg/l
Nitrogen, Ammonia	25	10.90	08/16/1996	0.83	06/28/2006	1.63	mg/l
Nitrogen, Organic	25	12.00	09/15/2007	0.20	01/29/1991	3.56	mg/l
Nitrogen, Total Kjeldahl	25	13.00	09/15/2007	0.50	08/14/1995	4.26	mg/l
pH, lab	131	9.00	04/24/1991	7.40	06/16/1997	8.70	units
Phosphate, total	21	155.00	06/28/2006	0.06	05/08/2020	8.29	mg/l
Phosphorus, total	24	3.63	08/01/1990	0.02	06/28/2006	0.27	mg/l
SAR in Water	125	198.04	10/25/1990	0.08	04/24/1991	48.13	none
Sulfate	90	333.00	01/20/1992	0.60	09/29/1997	49.26	mg/l
Sulfide	19	6.21	08/01/1990	0.03	06/28/2006	0.76	mg/l
Total Dissolved Solids	132	1,490.00	08/10/2008	813.00	11/23/2010	1,014.77	mg/l
Conductivity, Field	192	2,200.00	05/16/2007	1,135.00	06/16/1997	1,557.72	µmhos
pH, Field	192	10.60	12/16/2002	7.00	10/09/2019	8.67	units
Temperature (°C), Field	133	19.70	05/01/2002	7.90	02/09/2021	12.35	(°C)
Water Level, Field	112	547.50	08/07/2023	507.30	01/15/2016	531.11	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	26	9.47	06/16/1997	0.04	06/14/2000	1.73	mg/l
Arsenic, dissolved	26	0.02	08/01/1990	0.00	11/27/2012	0.00	mg/l
Barium, dissolved	26	0.96	06/16/1997	0.03	08/08/1990	0.36	mg/l
Beryllium, dissolved	26	U	06/16/1997	U	08/08/1990	U	mg/l
Boron, dissolved	135	0.93	03/18/2004	0.31	02/21/1994	0.74	mg/l
Cadmium, dissolved	26	0.03	07/21/1993	0.03	07/21/1993	0.03	mg/l
Calcium, dissolved	135	15.00	10/09/2019	0.80	12/12/2008	2.54	mg/l
Chromium, dissolved	26	U	06/16/1997	U	08/08/1990	U	mg/l
Copper, dissolved	26	0.40	07/31/1991	0.01	06/24/2004	0.21	mg/l
Iron, dissolved	26	12.10	06/16/1997	0.01	06/16/2005	1.65	mg/l
Lead, dissolved	26	0.07	06/16/1997	0.04	07/21/1992	0.06	mg/l
Lithium, dissolved	25	0.15	06/09/1999	0.04	07/21/1993	0.13	mg/l
Magnesium, dissolved	135	8.00	10/30/1991	0.90	12/12/2008	2.20	mg/l
Manganese, dissolved	25	0.08	06/16/1997	0.01	06/28/2006	0.02	mg/l
Mercury, dissolved	26	0.02	07/31/1991	0.00	08/14/1995	0.01	mg/l
Molybdenum, dissolved	26	0.14	08/01/1990	0.02	08/16/1996	0.07	mg/l
Nickel, dissolved	26	0.02	01/29/1991	0.01	09/21/2010	0.02	mg/l
Potassium, dissolved	135	12.00	07/31/1991	1.00	05/23/1994	1.65	mg/l
Selenium, dissolved	26	0.00	08/08/1990	U	08/08/1990	U	mg/l
Silica, dissolved	135	122.00	10/30/1991	0.30	04/24/1991	19.38	mg/l
Sodium, dissolved	135	882.00	08/10/2008	247.00	11/23/2010	408.59	mg/l
Strontium, dissolved	135	1.30	04/20/1992	0.06	06/14/2000	0.70	mg/l
Vanadium, dissolved	26	U	06/16/1997	U	08/08/1990	U	mg/l
Zinc, dissolved	26	0.53	07/31/1991	0.01	08/01/1990	0.09	mg/l

Appx. Table A-16: BG-4 Monthly B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	250	899.00	10/28/2002	524.00	09/14/2004	695.48	mg/l
Carbonate as CaCO3	250	225.00	09/13/2023	16.00	11/21/2008	95.16	mg/l
Total Alkalinity as CaCO3	250	984.00	05/07/2018	612.00	04/17/2002	787.23	mg/l
Bromide	32	0.10	08/12/2004	0.10	08/12/2004	0.10	mg/l
Cation-Anion Balance	249	13.40	08/02/2006	-12.80	05/07/2018	-2.32	%
Sum of Anions	249	22.00	05/07/2018	12.60	08/02/2006	17.82	meq/l
Sum of Cations	249	20.00	05/14/2020	13.60	04/29/2010	17.01	meq/l
Chemical Oxygen Demand	32	400.00	08/22/2002	10.00	08/02/2006	72.50	mg/l
Chloride	249	116.00	11/03/2020	2.00	08/02/2006	30.83	mg/l
Conductivity, Lab	249	1,960	01/12/2021	1,160	08/02/2006	1,575	µmhos
Fluoride	249	26.90	12/16/2003	2.09	06/06/2017	22.05	mg/l
Hardness as CaCO3	248	47.00	09/30/2008	5.00	11/27/2002	15.70	mg/l
Nitrate as N, dissolved	31	2.06	09/28/2006	0.03	11/06/2014	1.05	mg/l
Nitrate/Nitrite as N,	31	2.08	09/28/2006	0.02	05/18/2006	0.59	mg/l
Nitrite as N, dissolved	31	0.21	08/02/2006	0.01	05/18/2006	0.07	mg/l
Nitrogen, Ammonia	32	1.61	09/30/2008	0.43	05/14/2020	0.90	mg/l
Nitrogen, Organic	30	27.00	08/22/2002	0.50	08/02/2006	4.59	mg/l
Nitrogen, Total Kjeldahl	32	28.00	08/22/2002	1.00	04/13/2016	4.79	mg/l
pH, lab	250	9.20	05/21/2009	7.50	08/30/2008	8.78	units
Phosphate, total	28	155.00	05/18/2006	0.12	08/18/2010	37.54	mg/l
Phosphorus, total	32	0.32	05/14/2020	0.03	08/02/2006	0.08	mg/l
SAR in Water	248	73.30	12/16/2002	23.40	09/30/2008	42.84	none
Sulfate	247	126.00	09/13/2023	0.00	09/02/2015	17.24	mg/l
Sulfide	24	0.80	08/22/2002	0.03	09/28/2006	0.24	mg/l
Total Dissolved Solids	249	1,110	10/06/2020	789	08/02/2006	943	mg/l
Conductivity, Field	266	2,874	02/10/2016	1,101	10/05/2006	1,559	µmhos
pH, Field	265	10.01	07/29/2009	6.90	11/04/2019	8.53	units
Temperature (°C), Field	262	22.70	08/02/2016	5.80	01/26/2010	12.11	(°C)
Water Level, Field	258	547.26	11/10/2010	468.30	07/01/2002	506.49	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	34	1.26	05/14/2020	0.03	05/18/2006	0.19	mg/l
Arsenic, dissolved	34	0.00	09/30/2008	0.00	05/04/2021	0.00	mg/l
Barium, dissolved	34	0.21	07/03/2023	0.00	07/06/2017	0.04	mg/l
Beryllium, dissolved	34	U	08/22/2002	U	05/04/2021	U	mg/l
Boron, dissolved	250	0.97	07/12/2007	0.34	08/21/2003	0.73	mg/l
Cadmium, dissolved	34	U	08/22/2002	U	05/04/2021	U	mg/l
Calcium, dissolved	251	14.30	11/05/2021	1.10	12/16/2002	3.01	mg/l
Chromium, dissolved	34	0.02	09/28/2006	0.02	09/28/2006	0.02	mg/l
Copper, dissolved	34	U	08/22/2002	U	05/04/2021	U	mg/l
Iron, dissolved	34	2.08	05/14/2020	0.01	08/12/2004	0.20	mg/l
Lead, dissolved	34	0.04	05/06/2019	0.04	05/06/2019	0.04	mg/l
Lithium, dissolved	34	0.17	07/03/2023	0.08	08/21/2003	0.14	mg/l
Magnesium, dissolved	250	4.40	09/30/2008	0.60	11/27/2002	1.98	mg/l
Manganese, dissolved	32	0.19	09/30/2008	0.01	03/14/2008	0.03	mg/l
Mercury, dissolved	34	0.00	09/28/2006	0.00	09/28/2006	0.00	mg/l
Molybdenum, dissolved	34	0.12	08/22/2002	0.01	08/18/2010	0.04	mg/l
Nickel, dissolved	34	0.03	09/30/2008	0.01	12/03/2012	0.02	mg/l
Potassium, dissolved	251	6.20	07/24/2002	0.60	11/21/2008	1.54	mg/l
Selenium, dissolved	34	0.00	05/06/2019	0.00	05/06/2019	0.00	mg/l
Silica, dissolved	250	29.30	04/17/2002	5.50	08/21/2003	14.64	mg/l
Sodium, dissolved	251	451.00	08/03/2021	302.00	09/11/2013	377.00	mg/l
Strontium, dissolved	250	0.93	11/03/2020	0.06	04/27/2004	0.54	mg/l
Vanadium, dissolved	34	U	08/22/2002	U	05/04/2021	U	mg/l
Zinc, dissolved	34	0.13	08/30/2008	0.01	08/22/2002	0.04	mg/l

Appx. Table A-17: BG-6 Monthly B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	161	869.00	12/18/2013	541.00	12/08/2010	676.56	mg/l
Carbonate as CaCO3	161	219.00	12/08/2010	48.10	02/10/2020	86.13	mg/l
Total Alkalinity as CaCO3	161	1,040.00	12/18/2013	633.00	06/11/2014	761.63	mg/l
Bromide	16	U	08/11/2011	U	05/04/2021	U	mg/l
Cation-Anion Balance	160	5.90	04/09/2014	-9.70	01/12/2021	-2.52	%
Sum of Anions	160	23.00	12/18/2013	14.30	06/11/2014	16.93	meq/l
Sum of Cations	160	20.00	12/18/2013	13.10	04/11/2011	16.09	meq/l
Chemical Oxygen Demand	15	800.00	01/13/2011	10.00	07/07/2022	214.17	mg/l
Chloride	160	70.00	12/08/2010	10.00	01/20/2011	16.09	mg/l
Conductivity, Lab	161	8,820	06/03/2019	1,320	07/05/2017	1,552	µmhos
Fluoride	160	27.80	06/03/2019	14.60	09/17/2012	23.22	mg/l
Hardness as CaCO3	160	18.00	10/03/2023	10.00	09/11/2013	12.71	mg/l
Nitrate as N, dissolved	16	0.03	12/27/2012	UH	05/04/2021	UH	mg/l
Nitrate/Nitrite as N,	16	0.03	12/27/2012	UH	05/04/2021	UH	mg/l
Nitrite as N, dissolved	16	UH	08/11/2011	UH	05/04/2021	UH	mg/l
Nitrogen, Ammonia	15	0.95	10/12/2015	0.71	01/20/2011	0.83	mg/l
Nitrogen, Organic	15	8.30	01/13/2011	0.25	07/07/2022	2.30	mg/l
Nitrogen, Total Kjeldahl	15	9.00	01/13/2011	0.81	07/03/2023	2.80	mg/l
pH, lab	161	9.40	12/08/2010	8.00	01/11/2022	8.78	units
Phosphate, total	15	77.50	08/11/2011	0.08	07/03/2023	5.28	mg/l
Phosphorus, total	15	0.09	07/10/2013	0.03	07/03/2023	0.04	mg/l
SAR in Water	160	56.60	12/18/2013	37.00	03/07/2022	44.28	none
Sulfate	160	20.00	01/13/2011	3.45	11/02/2016	12.06	mg/l
Sulfide	15	0.10	01/20/2011	0.03	07/10/2013	0.05	mg/l
Total Dissolved Solids	160	1,130	12/18/2013	799	05/14/2014	884	mg/l
Conductivity, Field	158	2,413	09/17/2012	1,232	06/05/2017	1,477	µmhos
pH, Field	156	9.58	03/05/2012	6.60	11/04/2019	8.36	units
Temperature (°C), Field	158	23.00	09/05/2017	4.62	11/22/2011	11.91	(°C)
Water Level, Field	157	517.10	08/07/2017	493.95	10/12/2015	506.97	Ft.
Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	16	0.04	01/13/2011	U	07/10/2013	U	mg/l
Arsenic, dissolved	16	0.06	01/13/2011	0.00	04/12/2016	0.01	mg/l
Barium, dissolved	16	0.39	01/13/2011	0.31	07/05/2017	0.34	mg/l
Beryllium, dissolved	16	0.00	11/10/2014	U	07/10/2013	U	mg/l
Boron, dissolved	160	0.91	12/18/2013	0.62	12/08/2010	0.72	mg/l
Cadmium, dissolved	16	U	08/11/2011	U	07/10/2013	U	mg/l
Calcium, dissolved	160	4.10	03/07/2022	2.00	09/11/2013	2.44	mg/l
Chromium, dissolved	16	0.01	12/31/2018	U	07/10/2013	U	mg/l
Copper, dissolved	16	0.04	05/06/2019	U	07/10/2013	U	mg/l
Iron, dissolved	16	0.19	12/31/2018	0.02	12/04/2012	0.07	mg/l
Lead, dissolved	16	0.05	12/04/2012	U	07/10/2013	U	mg/l
Lithium, dissolved	16	0.13	01/13/2011	0.11	07/05/2017	0.12	mg/l
Magnesium, dissolved	160	2.45	10/03/2023	1.30	12/08/2010	1.60	mg/l
Manganese, dissolved	16	0.01	01/13/2011	U	07/10/2013	U	mg/l
Mercury, dissolved	17	U	08/11/2011	U	07/10/2013	U	mg/l
Molybdenum, dissolved	16	0.06	01/13/2011	U	07/10/2013	U	mg/l
Nickel, dissolved	16	U	08/11/2011	U	07/10/2013	U	mg/l
Potassium, dissolved	160	2.10	12/08/2010	0.60	11/02/2016	0.95	mg/l
Selenium, dissolved	16	U	08/11/2011	U	07/10/2013	U	mg/l
Silica, dissolved	160	17.80	08/03/2021	1.10	12/08/2010	15.56	mg/l
Sodium, dissolved	160	439.00	12/18/2013	292.00	04/11/2011	357.40	mg/l
Strontium, dissolved	160	0.83	09/07/2014	0.38	12/08/2010	0.70	mg/l
Vanadium, dissolved	16	U	08/11/2011	U	07/10/2013	U	mg/l
Zinc, dissolved	16	0.12	07/03/2023	0.01	12/04/2012	0.04	mg/l

Appx. Table A-18: BG-7 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	10	912	06/02/2020	501	12/15/2015	727	mg/l
Carbonate as CaCO3	10	307	12/15/2015	24	06/12/2023	165	mg/l
Total Alkalinity as CaCO3	10	992	06/02/2020	808	12/15/2015	891	mg/l
Bromide	10	0.14	10/18/2014	0.13	09/28/2017	0.13	mg/l
Cation-Anion Balance	10	2.40	06/25/2019	-4.80	06/02/2020	-0.92	%
Sum of Anions	10	24.00	10/18/2014	20.00	06/25/2019	21.90	meq/l
Sum of Cations	10	24.00	10/18/2014	19.00	06/03/2022	21.50	meq/l
Chemical Oxygen Demand	10	30.00	06/25/2019	10.00	06/02/2020	21.00	mg/l
Chloride	10	201	12/15/2015	14	06/12/2023	100	mg/l
Conductivity, Lab	10	2,340	10/18/2014	761	06/12/2023	1,906	µmhos
Fluoride	10	23.70	06/09/2021	18.20	12/15/2015	20.56	mg/l
Hardness as CaCO3	10	13.00	10/18/2014	11.00	04/05/2016	12.09	mg/l
Nitrate as N, dissolved	10	0.02	10/18/2014	UH	06/25/2019	UH	mg/l
Nitrate/Nitrite as N,	10	0.02	10/18/2014	UH	06/25/2019	UH	mg/l
Nitrite as N, dissolved	10	0.01	12/15/2015	0.00	10/18/2014	0.01	mg/l
Nitrogen, Ammonia	10	1.22	10/18/2014	0.80	06/12/2023	1.00	mg/l
Nitrogen, Organic	10	1.20	06/20/2018	0.20	10/18/2014	0.58	mg/l
Nitrogen, Total Kjeldahl	10	2.00	09/28/2017	0.85	06/03/2022	1.43	mg/l
pH, lab	10	9.60	12/15/2015	8.20	06/12/2023	8.98	units
Phosphate, total	10	0.40	12/15/2015	0.06	06/09/2021	0.15	mg/l
Phosphorus, total	10	0.13	12/15/2015	0.02	06/09/2021	0.05	mg/l
SAR in Water	10	66	04/05/2016	53.00	06/09/2021	60	none
Sulfate	10	40	10/18/2014	5.58	06/20/2018	16	mg/l
Sulfide	10	0.15	06/25/2019	0.02	06/02/2020	0.08	mg/l
Total Dissolved Solids	10	1,350	10/18/2014	1,050	06/03/2022	1,168	mg/l
Conductivity, Field	11	2,575	12/15/2015	1,594	10/25/2018	1,972	µmhos
pH, Field	11	9.40	06/20/2018	8.00	06/02/2020	8.68	units
Temperature (°C), Field	11	22.50	10/18/2014	11.49	10/25/2018	14.80	(°C)
Water Level, Field	11	480.10	09/28/2017	468.00	06/12/2023	475.53	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	10	0.08	10/18/2014	0.04	04/05/2016	0.07	mg/l
Arsenic, dissolved	10	0.03	10/18/2014	0.00	09/28/2017	0.01	mg/l
Barium, dissolved	10	0.40	06/09/2021	0.02	12/15/2015	0.22	mg/l
Beryllium, dissolved	10	U	10/18/2014	U	06/02/2020	U	mg/l
Boron, dissolved	10	0.84	06/12/2023	0.56	12/15/2015	0.71	mg/l
Cadmium, dissolved	10	U	10/18/2014	U	06/02/2020	U	mg/l
Calcium, dissolved	10	3.60	10/18/2014	1.40	06/20/2018	2.26	mg/l
Chromium, dissolved	10	U	10/18/2014	U	06/02/2020	U	mg/l
Copper, dissolved	10	U	10/18/2014	U	06/02/2020	U	mg/l
Iron, dissolved	10	0.36	09/28/2017	0.06	12/15/2015	0.16	mg/l
Lead, dissolved	10	U	10/18/2014	U	06/02/2020	U	mg/l
Lithium, dissolved	10	0.17	04/05/2016	0.09	06/02/2020	0.13	mg/l
Magnesium, dissolved	10	1.90	09/28/2017	1.00	10/18/2014	1.62	mg/l
Manganese, dissolved	10	0.02	09/28/2017	0.01	10/18/2014	0.01	mg/l
Mercury, dissolved	10	U	10/18/2014	U	06/02/2020	U	mg/l
Molybdenum, dissolved	10	0.14	10/18/2014	0.05	06/20/2018	0.09	mg/l
Nickel, dissolved	10	U	10/18/2014	U	06/02/2020	U	mg/l
Potassium, dissolved	10	14.50	10/18/2014	0.90	06/25/2019	6.35	mg/l
Selenium, dissolved	10	0.00	10/18/2014	U	06/02/2020	U	mg/l
Silica, dissolved	10	18.90	10/18/2014	0.90	12/15/2015	9.17	mg/l
Sodium, dissolved	10	536	10/18/2014	428	06/03/2022	474	mg/l
Strontium, dissolved	10	0.66	06/25/2019	0.16	12/15/2015	0.44	mg/l
Vanadium, dissolved	10	0.01	10/18/2014	U	06/02/2020	U	mg/l
Zinc, dissolved	10	0.04	12/15/2015	U	06/02/2020	U	mg/l

Appx. Table A-19: BG-10 Quarterly B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	12	599	08/04/2021	403	08/15/2023	499	mg/l
Carbonate as CaCO3	12	323	09/03/2021	192	09/10/2021	254	mg/l
Total Alkalinity as CaCO3	12	802	08/04/2021	709	06/03/2022	754	mg/l
Bromide	3	U	08/04/2021	U	09/10/2021	U	mg/l
Cation-Anion Balance	12	0.00	09/08/2022	-50.00	11/27/2023	-6.92	%
Sum of Anions	12	45.00	11/27/2023	16.00	06/03/2022	19.33	meq/l
Sum of Cations	12	17.00	08/04/2021	15.00	06/03/2022	15.92	meq/l
Chemical Oxygen Demand	3	247.00	08/04/2021	16.00	09/10/2021	98.67	mg/l
Chloride	12	1,070	11/27/2023	23	08/15/2023	116	mg/l
Conductivity, Lab	12	1,610	09/03/2021	1,460	11/27/2023	1,518	µmhos
Fluoride	12	22.70	09/08/2022	16.70	08/15/2023	20.47	mg/l
Hardness as CaCO3	12	88.00	08/04/2021	14.00	06/03/2022	22.17	mg/l
Nitrate as N, dissolved	3	UH	08/04/2021	UH	09/10/2021	UH	mg/l
Nitrate/Nitrite as N,	3	UH	08/04/2021	UH	09/10/2021	UH	mg/l
Nitrite as N, dissolved	3	UH	08/04/2021	UH	09/10/2021	UH	mg/l
Nitrogen, Ammonia	3	1.24	09/03/2021	0.82	08/04/2021	1.07	mg/l
Nitrogen, Organic	3	0.93	08/04/2021	0.20	09/10/2021	0.48	mg/l
Nitrogen, Total Kjeldahl	3	1.75	08/04/2021	1.38	09/10/2021	1.55	mg/l
pH, lab	12	9.70	09/03/2021	9.20	08/04/2021	9.42	units
Phosphate, total	3	6.30	08/04/2021	1.01	09/10/2021	3.34	mg/l
Phosphorus, total	3	2.02	08/04/2021	0.33	09/10/2021	1.08	mg/l
SAR in Water	12	41	03/14/2022	16.00	08/04/2021	36	none
Sulfate	12	U	08/04/2021	U	09/10/2021	U	mg/l
Sulfide	3	0.09	09/10/2021	0.07	09/03/2021	0.08	mg/l
Total Dissolved Solids	12	1,880	11/27/2023	824	08/15/2023	960	mg/l
Conductivity, Field	16	1,620	07/23/2021	1,383	08/15/2023	1,467	µmhos
pH, Field	16	9.53	11/27/2023	7.04	07/23/2021	8.86	units
Temperature (°C), Field	16	25.50	07/23/2021	11.11	11/27/2023	16.96	(°C)
Water Level, Field	11	541.50	11/27/2023	441.60	03/14/2022	458.29	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Arsenic, dissolved	3	0.0114	08/04/2021	0.0011	09/10/2021	0.0047	mg/l
Barium, dissolved	3	0.40	09/10/2021	0.07	08/04/2021	0.24	mg/l
Beryllium, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Boron, dissolved	12	0.82	08/04/2021	0.71	09/03/2021	0.74	mg/l
Cadmium, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Calcium, dissolved	12	17.40	08/04/2021	2.44	02/13/2023	4.14	mg/l
Chromium, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Copper, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Iron, dissolved	3	1.06	09/03/2021	0.45	09/10/2021	0.66	mg/l
Lead, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Lithium, dissolved	3	0.26	08/04/2021	0.23	09/10/2021	0.24	mg/l
Magnesium, dissolved	12	10.80	08/04/2021	1.81	09/08/2022	2.85	mg/l
Manganese, dissolved	3	0.03	08/04/2021	0.02	09/10/2021	0.02	mg/l
Mercury, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Molybdenum, dissolved	3	0.02	08/04/2021	0.02	08/04/2021	0.02	mg/l
Nickel, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Potassium, dissolved	12	8.03	09/03/2021	3.96	05/22/2023	5.39	mg/l
Selenium, dissolved	3	0.01	09/03/2021	0.00	08/04/2021	0.01	mg/l
Silica, dissolved	12	15.80	08/04/2021	3.30	03/14/2022	4.98	mg/l
Sodium, dissolved	12	356	09/03/2021	332	08/15/2023	347	mg/l
Strontium, dissolved	12	0.69	09/10/2021	0.54	08/04/2021	0.61	mg/l
Vanadium, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l
Zinc, dissolved	3	U	08/04/2021	U	09/10/2021	U	mg/l

Appx. Table A-20: BG-11 Quarterly B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	20	977	11/27/2023	683	03/05/2021	787	mg/l
Carbonate as CaCO3	20	240	08/15/2023	63	03/16/2021	136	mg/l
Total Alkalinity as CaCO3	20	1,110	11/27/2023	830	05/03/2021	923	mg/l
Bromide	4	U	03/05/2021	U	05/03/2021	U	mg/l
Cation-Anion Balance	20	4.80	08/02/2021	-7.70	07/12/2021	-1.96	%
Sum of Anions	20	31.00	11/27/2023	19.00	03/05/2021	22.80	meq/l
Sum of Cations	20	29.00	11/27/2023	17.00	03/05/2021	21.95	meq/l
Chemical Oxygen Demand	4	34.00	03/05/2021	10.00	03/09/2021	16.75	mg/l
Chloride	20	265	11/27/2023	43	03/16/2021	117	mg/l
Conductivity, Lab	20	2,810	11/27/2023	1,690	05/03/2021	2,045	µmhos
Fluoride	20	24.70	05/03/2021	15.30	08/15/2023	20.80	mg/l
Hardness as CaCO3	20	26.00	11/27/2023	14.00	03/16/2021	18.75	mg/l
Nitrate as N, dissolved	4	0.06	03/05/2021	UH	05/03/2021	UH	mg/l
Nitrate/Nitrite as N,	4	0.06	03/05/2021	UH	05/03/2021	UH	mg/l
Nitrite as N, dissolved	4	UH	03/05/2021	UH	05/03/2021	UH	mg/l
Nitrogen, Ammonia	4	0.99	03/16/2021	0.89	03/05/2021	0.95	mg/l
Nitrogen, Organic	4	0.28	03/05/2021	0.28	03/05/2021	0.28	mg/l
Nitrogen, Total Kjeldahl	4	1.17	03/05/2021	0.96	03/16/2021	1.06	mg/l
pH, lab	20	9.20	11/02/2021	8.50	10/05/2021	8.88	units
Phosphate, total	4	2.04	03/05/2021	0.15	03/16/2021	0.65	mg/l
Phosphorus, total	4	0.66	03/05/2021	0.05	03/16/2021	0.21	mg/l
SAR in Water	20	56	09/07/2022	39.00	03/05/2021	50	none
Sulfate	20	5	03/05/2021	5.38	03/05/2021	5	mg/l
Sulfide	4	0.02	05/03/2021	0.02	05/03/2021	0.02	mg/l
Total Dissolved Solids	20	1,640	11/27/2023	972	03/05/2021	1,215	mg/l
Conductivity, Field	19	2,642	11/27/2023	1,637	03/09/2021	2,004	µmhos
pH, Field	19	8.96	11/27/2023	8.15	07/12/2021	8.56	units
Temperature (°C), Field	19	17.40	07/12/2021	12.20	02/13/2023	14.57	(°C)
Water Level, Field	19	561.40	11/08/2022	539.40	03/16/2021	549.83	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l
Arsenic, dissolved	4	0.03	03/09/2021	0.00	05/03/2021	0.01	mg/l
Barium, dissolved	4	0.41	05/03/2021	0.19	03/05/2021	0.32	mg/l
Beryllium, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l
Boron, dissolved	20	0.92	11/27/2023	0.74	03/05/2021	0.83	mg/l
Cadmium, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l
Calcium, dissolved	20	4.78	12/07/2021	2.75	04/05/2021	3.58	mg/l
Chromium, dissolved	4	0.01	03/05/2021	0.01	03/05/2021	0.01	mg/l
Copper, dissolved	4	0.01	05/03/2021	0.01	05/03/2021	0.01	mg/l
Iron, dissolved	4	0.94	03/16/2021	0.40	05/03/2021	0.66	mg/l
Lead, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l
Lithium, dissolved	4	0.16	03/16/2021	0.15	03/05/2021	0.16	mg/l
Magnesium, dissolved	20	3.50	11/27/2023	1.79	03/16/2021	2.38	mg/l
Manganese, dissolved	4	0.04	03/05/2021	0.02	03/16/2021	0.03	mg/l
Mercury, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l
Molybdenum, dissolved	4	0.13	03/09/2021	0.06	03/05/2021	0.09	mg/l
Nickel, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l
Potassium, dissolved	20	2.90	08/02/2021	0.90	04/05/2021	1.22	mg/l
Selenium, dissolved	4	0.00	03/09/2021	0.00	03/05/2021	0.00	mg/l
Silica, dissolved	20	16.60	11/02/2021	10.30	03/05/2021	15.00	mg/l
Sodium, dissolved	20	654	11/27/2023	372	03/05/2021	488	mg/l
Strontium, dissolved	20	1.60	11/27/2023	0.63	03/05/2021	0.96	mg/l
Vanadium, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l
Zinc, dissolved	4	U	03/05/2021	U	05/03/2021	U	mg/l

Appx. Table A-21: MMC-IRI-6 Annual B-Groove Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	67	806.00	12/16/1992	183.00	01/24/2023	627.19	mg/l
Carbonate as CaCO3	67	754.00	09/27/1990	10.00	06/16/1992	102.28	mg/l
Total Alkalinity as CaCO3	67	1,064.00	09/27/1990	250.00	01/24/2023	708.16	mg/l
Bromide	36	2.60	09/07/1990	0.06	05/26/2000	0.74	mg/l
Cation-Anion Balance	65	11.10	05/29/2002	-9.40	07/29/2009	0.19	%
Sum of Anions	59	24.21	09/27/1990	9.70	01/24/2023	16.31	meq/l
Sum of Cations	59	23.84	09/27/1990	9.50	01/24/2023	16.31	meq/l
Chemical Oxygen Demand	28	550.00	07/29/2009	11.00	08/24/2017	145.19	mg/l
Chloride	66	524.00	09/07/1990	11.00	06/30/1995	40.98	mg/l
Conductivity, Lab	65	1,660.00	09/08/1993	932.00	01/24/2023	1,429.18	µmhos
Fluoride	67	32.00	09/28/1994	2.80	05/28/1991	21.64	mg/l
Hardness as CaCO3	65	59.00	09/27/1990	3.00	06/30/2009	11.46	mg/l
Nitrate as N, dissolved	35	1.99	06/14/2008	0.02	06/30/1995	0.23	mg/l
Nitrate/Nitrite as N,	35	2.13	06/14/2008	0.02	09/28/1994	0.24	mg/l
Nitrite as N, dissolved	35	0.14	06/14/2008	0.01	10/03/2012	0.08	mg/l
Nitrogen, Ammonia	35	5.70	05/09/2001	0.58	05/21/2007	1.12	mg/l
Nitrogen, Organic	35	34.70	07/29/2009	0.37	03/08/2021	8.31	mg/l
Nitrogen, Total Kjeldahl	35	35.50	07/29/2009	1.13	03/08/2021	9.40	mg/l
pH, lab	65	11.60	12/20/1993	8.40	12/30/1996	8.86	units
Phosphate, total	35	0.90	09/07/1990	0.03	05/26/2000	0.14	mg/l
Phosphorus, total	35	0.30	09/07/1990	0.01	06/18/1996	0.05	mg/l
SAR in Water	55	92.00	11/27/2002	12.00	01/24/2023	51.69	none
Sulfate	67	210.00	01/24/2023	2.00	05/28/1991	25.91	mg/l
Sulfide	35	0.80	09/07/1990	0.01	05/26/2004	0.13	mg/l
Total Dissolved Solids	66	1,428.00	09/27/1990	600.00	01/24/2023	909.17	mg/l
Conductivity, Field	90	3,803.00	09/01/2009	982.00	11/21/2005	1,535.68	µmhos
pH, Field	89	12.00	09/27/1990	7.60	09/16/2019	9.27	units
Temperature (°C), Field	47	16.20	06/14/2008	7.70	02/12/2023	12.12	(°C)
Water Level, Field	64	435.60	08/24/2017	398.45	11/01/1990	412.85	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	34	3.79	09/27/1990	0.03	05/26/2004	0.65	mg/l
Arsenic, dissolved	34	0.03	09/27/1990	0.00	05/26/2004	0.01	mg/l
Barium, dissolved	34	0.44	03/08/2021	0.01	09/07/1990	0.24	mg/l
Beryllium, dissolved	34	U	03/08/2021	U	09/07/1990	U	mg/l
Boron, dissolved	67	0.72	01/31/1991	0.08	01/24/2023	0.56	mg/l
Cadmium, dissolved	34	U	03/08/2021	U	09/07/1990	U	mg/l
Calcium, dissolved	67	12.00	09/27/1990	0.00	02/26/1991	2.38	mg/l
Chromium, dissolved	34	0.01	03/08/2021	0.01	09/07/1990	0.01	mg/l
Copper, dissolved	34	0.07	10/22/2013	0.07	10/22/2013	0.07	mg/l
Iron, dissolved	34	0.24	11/06/2014	0.01	05/26/1999	0.05	mg/l
Lead, dissolved	34	0.32	03/22/2016	0.02	06/23/1994	0.15	mg/l
Lithium, dissolved	34	0.13	09/07/1990	0.06	09/15/1992	0.08	mg/l
Magnesium, dissolved	67	7.00	09/27/1990	0.00	02/26/1991	1.29	mg/l
Manganese, dissolved	34	0.02	03/27/2018	0.01	07/31/1991	0.01	mg/l
Mercury, dissolved	34	U	03/08/2021	U	09/07/1990	U	mg/l
Molybdenum, dissolved	34	0.02	03/22/2016	0.02	03/22/2016	0.02	mg/l
Nickel, dissolved	34	0.02	06/23/1994	0.02	06/23/1994	0.02	mg/l
Potassium, dissolved	67	13.00	09/07/1990	0.86	03/08/2021	1.79	mg/l
Selenium, dissolved	34	0.0020	09/27/1990	0.0010	07/31/1991	0.0015	mg/l
Silica, dissolved	67	63.00	09/27/1990	9.50	12/20/1993	17.26	mg/l
Sodium, dissolved	67	508.00	09/27/1990	191.00	01/24/2023	364.73	mg/l
Strontium, dissolved	67	0.78	03/08/2021	0.00	12/20/1993	0.48	mg/l
Vanadium, dissolved	34	0.010	09/07/1990	0.007	06/18/1996	0.009	mg/l
Zinc, dissolved	34	0.130	10/22/2013	0.010	05/09/2001	0.031	mg/l

Appx. Table A-22: DS-3 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	218	43,000	05/24/2005	17,400	11/27/2002	27,126	mg/l
Carbonate as CaCO3	218	23,900	05/03/2008	419	06/26/2002	3,932	mg/l
Total Alkalinity as CaCO3	218	60,100	03/14/2008	21,900	06/11/2014	30,885	mg/l
Bromide	33	5.00	05/03/2008	0.70	08/02/2006	2.18	mg/l
Cation-Anion Balance	218	13.50	10/28/2002	-93.80	04/10/2013	-4.68	%
Sum of Anions	218	1,440.00	04/07/2020	511.00	04/29/2003	780.79	meq/l
Sum of Cations	218	1,730.00	03/14/2008	20.70	04/10/2013	726.52	meq/l
Chemical Oxygen Demand	33	1,100.00	07/30/2009	140.00	08/21/2003	397.20	mg/l
Chloride	218	17,200.00	12/19/2018	39.00	05/24/2005	5,703.23	mg/l
Conductivity, Lab	218	81,800	02/13/2019	27,200	09/28/2006	47,338	µmhos
Fluoride	218	329.00	11/07/2018	2.80	05/24/2005	61.42	mg/l
Hardness as CaCO3	218	49.00	03/08/2011	1.00	01/28/2003	14.93	mg/l
Nitrate as N, dissolved	33	0.10	08/12/2004	0.02	09/28/2006	0.05	mg/l
Nitrate/Nitrite as N,	33	0.14	11/10/2014	0.02	09/28/2006	0.05	mg/l
Nitrite as N, dissolved	33	0.05	11/10/2014	0.01	07/11/2013	0.03	mg/l
Nitrogen, Ammonia	33	34.20	12/19/2018	4.84	03/14/2022	12.88	mg/l
Nitrogen, Organic	33	28.00	08/22/2002	0.80	09/30/2008	8.90	mg/l
Nitrogen, Total Kjeldahl	33	50.00	12/19/2018	3.50	09/23/2010	19.64	mg/l
pH, lab	218	9.20	04/10/2008	7.90	10/28/2002	8.62	units
Phosphate, total	33	155.00	07/30/2009	3.10	08/16/2011	34.23	mg/l
Phosphorus, total	33	183.00	09/30/2008	3.20	06/26/2007	14.46	mg/l
SAR in Water	152	8,450	05/18/2006	0.00	12/09/2014	2,475	none
Sulfate	218	1,860	09/23/2010	0.00	09/02/2015	206	mg/l
Sulfide	33	18.10	06/10/2020	0.04	08/25/2005	3.86	mg/l
Total Dissolved Solids	218	88,500	03/14/2008	18,500	05/29/2003	41,507	mg/l
Conductivity, Field	240	86,810	02/13/2019	30,600	04/29/2003	50,316	µmhos
pH, Field	239	9.91	06/30/2009	7.00	03/09/2016	8.43	units
Temperature (°C), Field	239	24.40	07/05/2016	5.30	02/09/2012	12.87	(°C)
Water Level, Field	246	547.30	08/02/2021	484.10	02/04/2016	521.75	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	34	79.90	08/12/2004	0.40	03/14/2008	17.00	mg/l
Arsenic, dissolved	34	0.02	06/10/2020	0.01	12/04/2012	0.02	mg/l
Barium, dissolved	34	3.32	08/25/2005	0.19	08/19/2007	1.81	mg/l
Beryllium, dissolved	34	U	12/19/2018	U	06/10/2020	U	mg/l
Boron, dissolved	219	74.70	02/13/2019	3.69	05/29/2003	19.27	mg/l
Cadmium, dissolved	34	U	12/19/2018	U	06/10/2020	U	mg/l
Calcium, dissolved	219	14.00	07/10/2017	0.30	05/29/2003	4.05	mg/l
Chromium, dissolved	34	0.01	05/18/2006	0.01	05/18/2006	0.01	mg/l
Copper, dissolved	34	1.20	08/16/2011	0.50	08/12/2004	0.85	mg/l
Iron, dissolved	34	3.70	09/15/2007	0.07	05/18/2006	1.49	mg/l
Lead, dissolved	34	1.40	08/22/2002	0.22	03/14/2008	0.81	mg/l
Lithium, dissolved	34	8.48	03/14/2008	2.70	12/19/2018	3.35	mg/l
Magnesium, dissolved	219	10.00	01/08/2008	0.00	09/02/2015	3.99	mg/l
Manganese, dissolved	34	U	12/19/2018	U	06/10/2020	U	mg/l
Mercury, dissolved	34	U	12/19/2018	U	06/10/2020	U	mg/l
Molybdenum, dissolved	34	0.70	08/19/2007	0.30	08/18/2010	0.45	mg/l
Nickel, dissolved	34	0.20	09/23/2010	0.02	05/18/2006	0.13	mg/l
Potassium, dissolved	219	150.00	02/13/2019	0.00	11/21/2008	36.60	mg/l
Selenium, dissolved	34	0.01	08/22/2002	0.00	07/12/2007	0.01	mg/l
Silica, dissolved	219	79.00	04/11/2006	8.90	05/29/2003	25.87	mg/l
Sodium, dissolved	219	39,200	03/14/2008	450	04/10/2013	16,595	mg/l
Strontium, dissolved	219	0.70	02/21/2005	0.04	05/29/2003	0.22	mg/l
Vanadium, dissolved	34	0.20	06/26/2007	0.01	05/18/2006	0.08	mg/l
Zinc, dissolved	34	1.80	07/10/2017	0.02	03/14/2008	0.68	mg/l

Appx. Table A-23: DS-6 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	79	9,560	07/06/2020	5,770	12/07/2017	7,147	mg/l
Carbonate as CaCO3	79	5,060	03/07/2018	2,110	07/06/2020	3,696	mg/l
Total Alkalinity as CaCO3	79	12,400	03/05/2020	9,650	08/09/2016	10,841	mg/l
Bromide	12	U	07/11/2017	U	05/03/2021	U	mg/l
Cation-Anion Balance	78	2.60	02/11/2020	-13.30	07/06/2020	-4.16	%
Sum of Anions	78	272.00	03/05/2020	219.00	11/03/2020	240.10	meq/l
Sum of Cations	78	255.00	02/11/2020	188.00	12/01/2020	221.00	meq/l
Chemical Oxygen Demand	12	167.00	12/09/2014	44.00	04/05/2016	80.50	mg/l
Chloride	78	1,330	12/09/2014	448	11/03/2020	700	mg/l
Conductivity, Lab	79	19,800	12/09/2014	14,900	12/01/2020	16,967	µmhos
Fluoride	78	51.00	04/07/2020	26.80	09/08/2015	37.24	mg/l
Hardness as CaCO3	78	30.00	09/22/2016	U	01/03/2017	6.63	mg/l
Nitrate as N, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Nitrate/Nitrite as N,	12	0.02	12/09/2014	0.02	12/09/2014	0.02	mg/l
Nitrite as N, dissolved	12	0.03	12/09/2014	0.03	12/09/2014	0.03	mg/l
Nitrogen, Ammonia	12	4.95	06/20/2023	0.58	03/14/2022	3.64	mg/l
Nitrogen, Organic	12	7.00	03/14/2022	0.80	07/11/2017	3.35	mg/l
Nitrogen, Total Kjeldahl	12	9.30	05/07/2019	4.70	07/11/2017	6.92	mg/l
pH, lab	79	9.50	03/01/2017	9.00	08/10/2020	9.26	units
Phosphate, total	12	7.00	09/27/2016	0.71	12/09/2014	4.92	mg/l
Phosphorus, total	12	2.20	09/27/2016	0.23	12/09/2014	1.58	mg/l
SAR in Water	55	1,600	02/11/2020	410.00	09/22/2016	1,040	none
Sulfate	78	370	12/09/2014	20.60	09/04/2020	86	mg/l
Sulfide	12	3.00	07/11/2017	0.30	04/05/2016	1.72	mg/l
Total Dissolved Solids	78	14,100	12/09/2014	11,200	12/01/2020	12,482	mg/l
Conductivity, Field	74	19,680	05/07/2019	13,820	05/01/2020	16,845	µmhos
pH, Field	74	9.70	08/09/2016	7.30	12/10/2018	8.97	units
Temperature (°C), Field	74	20.40	06/20/2023	8.00	01/14/2020	12.18	(°C)
Water Level, Field	80	550.40	09/08/2021	489.40	10/06/2020	523.92	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Arsenic, dissolved	12	0.01	12/09/2014	U	12/09/2014	0.01	mg/l
Barium, dissolved	12	0.46	10/04/2016	0.05	04/05/2016	0.26	mg/l
Beryllium, dissolved	12	U	10/04/2016	U	10/04/2016	U	mg/l
Boron, dissolved	77	8.66	06/20/2023	6.20	10/04/2017	7.60	mg/l
Cadmium, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Calcium, dissolved	77	7.34	06/07/2021	U	03/25/2015	1.99	mg/l
Chromium, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Copper, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Iron, dissolved	12	0.60	12/09/2014	0.20	09/22/2016	0.38	mg/l
Lead, dissolved	12	U	05/07/2019	U	05/07/2019	U	mg/l
Lithium, dissolved	12	2.95	06/20/2023	1.94	09/27/2016	2.23	mg/l
Magnesium, dissolved	77	4.00	03/25/2015	U	09/08/2015	2.71	mg/l
Manganese, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Mercury, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Molybdenum, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Nickel, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Potassium, dissolved	77	113.00	12/09/2014	45.20	12/01/2020	72.06	mg/l
Selenium, dissolved	12	U	09/22/2016	U	09/22/2016	U	mg/l
Silica, dissolved	77	34.00	07/11/2017	7.00	01/27/2016	26.26	mg/l
Sodium, dissolved	77	5,750	02/11/2020	4,240	12/01/2020	4,977	mg/l
Strontium, dissolved	77	0.48	12/07/2021	U	12/29/2015	0.18	mg/l
Vanadium, dissolved	12	U	07/11/2017	U	05/03/2021	U	mg/l
Zinc, dissolved	12	0.40	09/22/2016	U	07/11/2017	0.28	mg/l

Appx. Table A-24: DS-7 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	85	33,500	04/08/2019	9,000	12/07/2020	24,002	mg/l
Carbonate as CaCO3	85	16,600	08/02/2016	63	12/07/2020	4,683	mg/l
Total Alkalinity as CaCO3	85	41,300	07/07/2016	9,060	12/07/2020	28,573	mg/l
Bromide	11	U	05/07/2019	U	05/04/2021	U	mg/l
Cation-Anion Balance	85	21.30	03/05/2020	-15.70	10/06/2020	-2.04	%
Sum of Anions	85	3,360	12/17/2014	302	12/07/2020	1,241	meq/l
Sum of Cations	85	3,230	12/17/2014	293	03/15/2022	1,180	meq/l
Chemical Oxygen Demand	11	3,630	11/05/2015	110	06/20/2023	1,495	mg/l
Chloride	85	96,000	12/30/2014	3,850	10/12/2021	23,781	mg/l
Conductivity, Lab	85	207,000	12/17/2014	24,000	11/02/2020	73,368	µmhos
Fluoride	85	106.00	12/10/2019	38.50	10/06/2020	63.93	mg/l
Hardness as CaCO3	85	82.40	12/16/2015	0.00	12/30/2014	28.53	mg/l
Nitrate as N, dissolved	11	0.03	05/07/2020	0.03	05/07/2020	0.03	mg/l
Nitrate/Nitrite as N,	11	0.03	05/07/2020	0.03	05/07/2020	0.03	mg/l
Nitrite as N, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Nitrogen, Ammonia	11	40.40	12/17/2014	3.33	05/04/2021	13.22	mg/l
Nitrogen, Organic	11	7.00	05/07/2019	3.00	05/04/2021	4.36	mg/l
Nitrogen, Total Kjeldahl	11	33.00	12/30/2014	1.10	11/05/2015	11.42	mg/l
pH, lab	85	9.10	05/06/2015	8.30	04/08/2020	8.61	units
Phosphate, total	11	71.00	11/05/2015	5.60	06/20/2023	31.74	mg/l
Phosphorus, total	11	23.00	11/05/2015	1.80	06/20/2023	10.27	mg/l
SAR in Water	31	7,600	06/08/2016	650.00	06/20/2023	2,410	none
Sulfate	85	480	12/30/2014	110.00	07/11/2017	350	mg/l
Sulfide	11	4.80	05/07/2019	1.30	12/17/2014	2.60	mg/l
Total Dissolved Solids	85	189,676	12/17/2014	16,600	11/05/2021	68,103	mg/l
Conductivity, Field	83	186,700	12/17/2014	23,110	06/20/2023	74,087	µmhos
pH, Field	83	9.20	03/10/2016	7.10	12/17/2014	8.29	units
Temperature (°C), Field	83	20.70	06/20/2023	7.20	02/09/2021	12.98	(°C)
Water Level, Field	89	643.10	12/12/2014	478.76	11/09/2016	504.60	Ft.
Parameters Metals	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Arsenic, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Barium, dissolved	11	1.90	07/11/2017	0.40	11/05/2015	1.03	mg/l
Beryllium, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Boron, dissolved	85	66.00	09/09/2015	7.10	01/09/2018	23.53	mg/l
Cadmium, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Calcium, dissolved	85	30.00	05/06/2015	0.00	12/30/2014	6.97	mg/l
Chromium, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Copper, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Iron, dissolved	11	5.00	12/30/2014	0.64	03/15/2022	2.88	mg/l
Lead, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Lithium, dissolved	11	2.73	06/20/2023	1.00	12/30/2014	2.10	mg/l
Magnesium, dissolved	85	20.00	06/17/2015	2.16	10/12/2021	12.23	mg/l
Manganese, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Mercury, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Molybdenum, dissolved	11	2.00	04/05/2016	2.00	04/05/2016	2.00	mg/l
Nickel, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Potassium, dissolved	85	140.00	09/09/2015	14.20	03/15/2022	45.77	mg/l
Selenium, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Silica, dissolved	85	55.00	06/08/2021	16.00	09/11/2017	22.89	mg/l
Sodium, dissolved	85	73,200	12/17/2014	6,630	03/15/2022	26,784	mg/l
Strontium, dissolved	85	1.00	08/12/2015	0.10	06/08/2016	0.33	mg/l
Vanadium, dissolved	11	U	05/07/2019	U	05/04/2021	U	mg/l
Zinc, dissolved	11	0.50	07/11/2017	0.50	07/11/2017	0.50	mg/l

Appx. Table A-25: DS-8 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	11	23,300	01/15/2015	16,000	04/07/2022	18,964	mg/l
Carbonate as CaCO3	11	9,590	06/25/2019	4,200	01/15/2015	7,310	mg/l
Total Alkalinity as CaCO3	11	27,500	01/15/2015	24,600	04/07/2022	26,282	mg/l
Bromide	11	U	06/25/2019	U	01/15/2015	U	mg/l
Cation-Anion Balance	11	-1.40	06/25/2019	-9.50	01/08/2015	-4.06	%
Sum of Anions	11	586.00	06/03/2020	530.00	04/07/2022	561.18	meq/l
Sum of Cations	11	552.00	06/25/2019	477.00	01/08/2015	517.45	meq/l
Chemical Oxygen Demand	11	731.00	01/15/2015	95.00	09/28/2017	214.00	mg/l
Chloride	11	1,080	06/25/2019	868	06/12/2023	978	mg/l
Conductivity, Lab	11	37,100	06/19/2018	600	06/12/2023	31,900	µmhos
Fluoride	11	83.70	06/08/2021	61.80	06/19/2018	70.51	mg/l
Hardness as CaCO3	11	18.00	06/12/2023	7.00	04/07/2022	12.50	mg/l
Nitrate as N, dissolved	11	0.0300	01/15/2015	0.0000	01/08/2015	0.0150	mg/l
Nitrate/Nitrite as N,	11	0.0300	01/15/2015	0.0000	01/08/2015	0.0150	mg/l
Nitrite as N, dissolved	11	0.0130	06/12/2023	0.0000	01/08/2015	0.0058	mg/l
Nitrogen, Ammonia	11	13.00	06/12/2023	5.93	06/08/2021	8.74	mg/l
Nitrogen, Organic	11	10.00	06/08/2021	1.30	06/19/2018	5.30	mg/l
Nitrogen, Total Kjeldahl	11	15.60	06/08/2021	6.80	06/03/2020	12.22	mg/l
pH, lab	11	9.30	04/07/2022	8.40	06/12/2023	9.02	units
Phosphate, total	11	25.00	06/25/2019	15.00	12/15/2015	19.55	mg/l
Phosphorus, total	11	8.20	06/25/2019	4.90	12/15/2015	6.33	mg/l
SAR in Water	2	1,900	04/07/2022	1,200.00	06/12/2023	1,550	none
Sulfate	11	368	06/25/2019	100.00	01/08/2015	229	mg/l
Sulfide	11	2.89	04/07/2022	0.60	04/05/2016	1.85	mg/l
Total Dissolved Solids	11	30,100	06/25/2019	27,700	04/07/2022	29,018	mg/l
Conductivity, Field	11	39,750	12/15/2015	31,210	04/05/2016	34,254	µmhos
pH, Field	11	9.23	06/19/2018	8.20	10/06/2014	8.91	units
Temperature (°C), Field	11	15.20	06/08/2021	11.20	10/06/2014	13.39	(°C)
Water Level, Field	11	505.00	06/11/2023	81.00	01/08/2015	459.92	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Arsenic, dissolved	11	0.07	01/15/2015	0.01	04/05/2016	0.03	mg/l
Barium, dissolved	11	1.00	01/15/2015	0.21	06/12/2023	0.52	mg/l
Beryllium, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Boron, dissolved	11	14.20	06/12/2023	12.70	04/05/2016	13.52	mg/l
Cadmium, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Calcium, dissolved	11	2.84	04/07/2022	2.84	04/07/2022	2.84	mg/l
Chromium, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Copper, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Iron, dissolved	11	2.70	01/15/2015	0.40	09/28/2017	1.44	mg/l
Lead, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Lithium, dissolved	11	5.30	06/12/2023	4.20	01/08/2015	4.63	mg/l
Magnesium, dissolved	11	4.39	06/12/2023	4.39	06/12/2023	4.39	mg/l
Manganese, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Mercury, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Molybdenum, dissolved	11	0.50	01/15/2015	0.43	06/08/2021	0.48	mg/l
Nickel, dissolved	11	0.30	01/15/2015	0.30	01/15/2015	0.30	mg/l
Potassium, dissolved	11	68.00	04/05/2016	43.00	01/08/2015	59.22	mg/l
Selenium, dissolved	11	U	01/15/2015	U	04/05/2016	U	mg/l
Silica, dissolved	11	60.00	06/08/2021	18.00	01/08/2015	39.55	mg/l
Sodium, dissolved	11	12,500	06/25/2019	10,800	01/08/2015	11,709	mg/l
Strontium, dissolved	11	0.10	01/15/2015	0.00	01/08/2015	0.07	mg/l
Vanadium, dissolved	11	0.10	06/25/2019	0.10	06/25/2019	0.10	mg/l
Zinc, dissolved	11	0.70	12/15/2015	0.70	12/15/2015	0.70	mg/l

Appx. Table A-26: DS-9 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	12	20,200	06/02/2020	11,900	06/20/2018	14,742	mg/l
Carbonate as CaCO3	12	4,570	04/22/2019	1,880	09/28/2017	2,706	mg/l
Total Alkalinity as CaCO3	12	22,200	06/02/2020	14,300	09/28/2017	17,442	mg/l
Bromide	12	U	09/28/2017	U	06/02/2020	U	mg/l
Cation-Anion Balance	12	-1.90	09/28/2017	-83.70	06/02/2020	-10.88	%
Sum of Anions	12	474.00	06/02/2020	341.00	06/20/2018	408.00	meq/l
Sum of Cations	12	429.00	06/03/2022	42.00	06/02/2020	341.83	meq/l
Chemical Oxygen Demand	12	132.00	09/28/2017	90.00	06/02/2020	112.00	mg/l
Chloride	12	2,470	02/04/2015	830	06/08/2021	1,723	mg/l
Conductivity, Lab	12	29,900	06/03/2022	24,300	12/15/2015	26,800	µmhos
Fluoride	12	62.50	04/22/2019	40.60	06/12/2023	48.27	mg/l
Hardness as CaCO3	12	36.00	01/28/2015	U	12/15/2015	20.00	mg/l
Nitrate as N, dissolved	12	0.03	01/28/2015	0.03	01/28/2015	0.03	mg/l
Nitrate/Nitrite as N,	12	0.04	01/28/2015	0.04	01/28/2015	0.04	mg/l
Nitrite as N, dissolved	12	0.01	01/28/2015	0.01	01/28/2015	0.01	mg/l
Nitrogen, Ammonia	12	8.55	06/12/2023	3.43	06/20/2018	5.43	mg/l
Nitrogen, Organic	12	6.00	06/08/2021	1.80	01/28/2015	3.99	mg/l
Nitrogen, Total Kjeldahl	12	10.50	06/08/2021	2.30	06/02/2020	7.97	mg/l
pH, lab	12	9.00	04/22/2019	6.70	06/12/2023	8.63	units
Phosphate, total	12	12.00	06/02/2020	3.70	02/04/2015	8.16	mg/l
Phosphorus, total	12	3.89	06/08/2021	1.20	02/04/2015	2.60	mg/l
SAR in Water	7	1,700	06/08/2021	83.00	06/02/2020	772	none
Sulfate	12	2,870	02/04/2015	10.80	04/22/2019	588	mg/l
Sulfide	12	0.47	06/03/2022	0.42	06/12/2023	0.44	mg/l
Total Dissolved Solids	12	24,100	06/03/2022	15,500	06/02/2020	20,575	mg/l
Conductivity, Field	11	29,450	04/22/2019	23,740	04/05/2016	26,946	µmhos
pH, Field	11	8.93	06/20/2018	7.20	01/29/2015	8.38	units
Temperature (°C), Field	11	14.35	06/20/2018	11.90	04/22/2019	13.17	(°C)
Water Level, Field	12	470.10	10/29/2014	448.30	06/12/2023	455.80	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Arsenic, dissolved	12	0.011	11/04/2014	0.003	02/04/2015	0.006	mg/l
Barium, dissolved	12	1.87	11/04/2014	0.12	02/04/2015	0.84	mg/l
Beryllium, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Boron, dissolved	12	13.90	06/08/2021	1.20	06/02/2020	9.78	mg/l
Cadmium, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Calcium, dissolved	12	6.00	11/04/2014	2.00	02/04/2015	3.25	mg/l
Chromium, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Copper, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Iron, dissolved	12	1.20	11/04/2014	0.20	12/15/2015	0.58	mg/l
Lead, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Lithium, dissolved	12	4.11	06/12/2023	0.20	06/02/2020	3.03	mg/l
Magnesium, dissolved	12	7.00	01/28/2015	2.03	06/12/2023	4.81	mg/l
Manganese, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Mercury, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Molybdenum, dissolved	12	0.30	02/04/2015	0.20	12/15/2015	0.25	mg/l
Nickel, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Potassium, dissolved	12	30.00	04/22/2019	18.10	06/12/2023	23.08	mg/l
Selenium, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Silica, dissolved	12	29.00	04/22/2019	12.00	06/02/2020	21.33	mg/l
Sodium, dissolved	12	9,730	06/03/2022	940	06/02/2020	7,742	mg/l
Strontium, dissolved	12	1.10	06/02/2020	0.06	09/28/2017	0.29	mg/l
Vanadium, dissolved	12	U	02/04/2015	U	06/08/2021	U	mg/l
Zinc, dissolved	12	1.90	12/15/2015	0.20	09/28/2017	0.83	mg/l

Appx. Table A-27: DS-10 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	32	41,100	07/08/2021	17,200	12/01/2020	23,519	mg/l
Carbonate as CaCO3	32	13,800	09/07/2021	566	09/03/2020	4,072	mg/l
Total Alkalinity as CaCO3	32	50,300	07/08/2021	19,400	11/02/2020	27,588	mg/l
Bromide	6	U	05/03/2021	U	05/13/2020	U	mg/l
Cation-Anion Balance	31	13.50	05/13/2020	-33.30	04/07/2020	-4.42	%
Sum of Anions	31	1,230.00	07/08/2021	447.00	11/02/2020	784.90	meq/l
Sum of Cations	31	1,280.00	09/07/2021	353.00	12/01/2020	725.94	meq/l
Chemical Oxygen	6	400.00	08/14/2019	177.00	06/20/2023	325.67	mg/l
Chloride	31	19,800	09/10/2019	2,040	11/02/2020	8,035	mg/l
Conductivity, Lab	32	74,500	09/10/2019	25,000	12/01/2020	49,988	µmhos
Fluoride	31	109.00	09/07/2021	29.00	09/10/2019	64.75	mg/l
Hardness as CaCO3	31	18.00	10/07/2019	7.00	04/05/2021	11.50	mg/l
Nitrate as N, dissolved	6	UH	05/03/2021	UH	05/13/2020	UH	mg/l
Nitrate/Nitrite as N,	6	UH	05/03/2021	UH	05/13/2020	UH	mg/l
Nitrite as N, dissolved	6	UH	05/03/2021	UH	05/13/2020	UH	mg/l
Nitrogen, Ammonia	6	19.80	03/14/2022	8.55	05/03/2021	12.83	mg/l
Nitrogen, Organic	6	9.00	05/03/2021	5.00	08/14/2019	6.75	mg/l
Nitrogen, Total Kjeldahl	6	22.50	06/20/2023	2.10	05/13/2020	15.18	mg/l
pH, lab	32	9.00	06/20/2023	8.50	06/02/2020	8.70	units
Phosphate, total	6	69.00	06/20/2023	22.00	08/14/2019	32.33	mg/l
Phosphorus, total	6	22.40	06/20/2023	7.10	08/14/2019	10.41	mg/l
SAR in Water	9	4,200	08/02/2021	1,200.00	11/02/2020	2,450	none
Sulfate	31	UH	05/03/2021	U	05/13/2020	U	mg/l
Sulfide	6	10.00	05/13/2020	0.29	06/20/2023	4.08	mg/l
Total Dissolved Solids	31	67,700	09/07/2021	22,700	12/01/2020	41,671	mg/l
Conductivity, Field	31	70,540	08/20/2019	28,730	12/01/2020	48,345	µmhos
pH, Field	30	8.90	01/11/2021	8.20	12/01/2020	8.55	units
Temperature (°C), Field	31	22.00	06/20/2023	9.32	02/10/2020	12.46	(°C)
Water Level, Field	38	627.80	04/07/2020	565.60	01/11/2021	591.36	Ft.

Parameters Metals	No. of Samples	High	Date	Low	Date	Average	Units
Aluminum, dissolved	6	U	05/03/2021	U	5/13/20	U	mg/l
Arsenic, dissolved	6	0.01	08/14/2019	0.01	03/14/2022	0.01	mg/l
Barium, dissolved	6	1.90	08/20/2019	1.02	06/20/2023	1.59	mg/l
Beryllium, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Boron, dissolved	31	61.00	09/07/2021	11.50	12/01/2020	23.12	mg/l
Cadmium, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Calcium, dissolved	31	7.00	10/07/2019	2.63	08/02/2021	4.61	mg/l
Chromium, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Copper, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Iron, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Lead, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Lithium, dissolved	6	3.70	05/13/2020	3.32	06/20/2023	3.55	mg/l
Magnesium, dissolved	31	U	05/03/2021	U	05/13/2020	U	mg/l
Manganese, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Mercury, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Molybdenum, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Nickel, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Potassium, dissolved	31	800.00	08/20/2019	44.10	12/01/2020	247.19	mg/l
Selenium, dissolved	6	0.0021	05/03/2021	0.0021	05/03/2021	0.0021	mg/l
Silica, dissolved	31	31.00	12/09/2019	15.00	12/01/2020	22.87	mg/l
Sodium, dissolved	31	29,100	09/07/2021	7,990	12/01/2020	16,352	mg/l
Strontium, dissolved	31	0.42	12/06/2021	0.20	08/02/2021	0.26	mg/l
Vanadium, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l
Zinc, dissolved	6	U	05/03/2021	U	05/13/2020	U	mg/l

Appx. Table A-28: MMC-IRI-7 Annual Dissolution Surface Aquifer

Parameters Wet Chemistry	No. of Samples	High	Date	Low	Date	Average	Units
Bicarbonate as CaCO3	65	31,900	03/15/2022	294	09/16/1991	9,030	mg/l
Carbonate as CaCO3	65	4,730	11/02/2015	10.00	06/30/1995	1,094	mg/l
Total Alkalinity as CaCO3	65	33,900	03/15/2022	294	09/16/1991	10,023	mg/l
Bromide	34	33.00	08/30/1990	0.10	05/21/2007	7.54	mg/l
Cation-Anion Balance	65	6.10	03/28/2018	-27.90	03/15/2022	-2.56	%
Sum of Anions	62	700.00	03/15/2022	30.69	03/25/1992	236.38	meq/l
Sum of Cations	62	409.00	03/09/2020	31.56	05/28/1991	212.30	meq/l
Chemical Oxygen	31	960.00	06/14/2008	37.00	09/27/2017	154.79	mg/l
Chloride	64	774.00	02/12/2023	21.00	08/30/1990	361.81	mg/l
Conductivity, Lab	63	39,600	03/15/2022	2,500	06/16/1992	14,188	µmhos
Fluoride	65	48.30	03/09/2021	1.30	05/28/1991	27.84	mg/l
Hardness as CaCO3	65	135.00	06/14/2008	6.00	08/30/1990	25.27	mg/l
Nitrate as N, dissolved	34	3.22	10/22/2013	0.02	05/24/2005	0.51	mg/l
Nitrate/Nitrite as N,	34	4.14	10/22/2013	0.02	09/27/2017	0.61	mg/l
Nitrite as N, dissolved	34	0.92	10/22/2013	0.00	05/21/2007	0.15	mg/l
Nitrogen, Ammonia	34	10.20	02/12/2023	1.17	09/15/1992	4.29	mg/l
Nitrogen, Organic	34	46.00	06/14/2008	0.50	08/22/1990	7.34	mg/l
Nitrogen, Total Kjeldahl	34	51.00	06/14/2008	1.90	08/22/1990	11.01	mg/l
pH, lab	65	9.20	06/16/1992	8.30	06/30/1995	8.64	units
Phosphate, total	32	155.00	05/21/2007	0.17	09/15/1992	16.37	mg/l
Phosphorus, total	35	9.63	03/15/2022	0.05	09/15/1992	2.20	mg/l
SAR in Water	55	1,600.00	03/15/2022	88.89	03/25/1992	425.26	none
Sulfate	64	2,031.00	09/16/1991	2.50	06/18/1996	169.18	mg/l
Sulfide	34	3.31	08/30/1990	0.00	07/31/1991	0.57	mg/l
Total Dissolved Solids	64	30,400	03/15/2022	1,708	09/15/1992	11,224	mg/l
Conductivity, Field	82	36,320	03/09/2020	1,800	06/01/1991	13,627	µmhos
pH, Field	81	12.20	09/01/1990	7.86	11/07/2015	8.88	units
Temperature (°C), Field	46	19.40	08/01/1990	7.50	12/01/1990	12.33	(°C)
Water Level, Field	59	424.20	02/12/2023	405.03	04/01/2001	411.10	Ft.
Parameters **Metals**	**No. of Samples**	**High**	**Date**	**Low**	**Date**	**Average**	**Units**
Aluminum, dissolved	34	1.40	09/15/2010	0.05	06/23/1994	0.61	mg/l
Arsenic, dissolved	34	0.0050	08/22/1990	0.0010	09/15/1992	0.0027	mg/l
Barium, dissolved	34	6.65	09/15/2010	0.08	09/15/1992	4.17	mg/l
Beryllium, dissolved	34	U	06/16/1997	U	08/08/1990	U	mg/l
Boron, dissolved	65	8.91	03/15/2022	0.03	02/26/1991	3.34	mg/l
Cadmium, dissolved	34	U	06/16/1997	U	08/08/1990	U	mg/l
Calcium, dissolved	65	44.00	06/14/2008	1.00	05/28/1991	3.45	mg/l
Chromium, dissolved	34	0.20	11/02/2015	0.01	06/23/1994	0.11	mg/l
Copper, dissolved	34	0.31	03/09/2021	0.10	07/29/2009	0.20	mg/l
Iron, dissolved	34	1.82	07/31/1991	0.04	06/23/1994	0.30	mg/l
Lead, dissolved	34	0.04	07/31/1991	0.02	06/23/1994	0.03	mg/l
Lithium, dissolved	34	4.10	03/09/2020	0.32	09/15/1992	2.25	mg/l
Magnesium, dissolved	65	10.00	12/30/1996	1.00	06/16/1992	4.64	mg/l
Manganese, dissolved	34	0.07	05/26/1999	0.01	06/23/1994	0.04	mg/l
Mercury, dissolved	34	U	06/16/1997	U	08/08/1990	U	mg/l
Molybdenum, dissolved	34	0.10	06/23/1994	0.10	06/23/1994	0.10	mg/l
Nickel, dissolved	34	0.02	06/23/1994	0.02	06/23/1994	0.02	mg/l
Potassium, dissolved	65	26.00	06/30/2009	3.00	08/30/1990	9.46	mg/l
Selenium, dissolved	34	0.0020	07/31/1991	0.0010	08/30/1990	0.0015	mg/l
Silica, dissolved	65	34.00	11/20/2001	1.50	02/26/1991	17.26	mg/l
Sodium, dissolved	65	9,280	03/09/2020	710	05/28/1991	4,359	mg/l
Strontium, dissolved	65	2.58	03/26/1997	0.18	06/16/1992	1.21	mg/l
Vanadium, dissolved	34	0.06	05/26/2004	0.05	11/02/2015	0.06	mg/l
Zinc, dissolved	34	0.30	03/09/2020	0.01	06/23/1994	0.10	mg/l

Appx. Table A-29: Summary of 2023 Annual Remote Water Levels

NS Remote Wells – Sampled for Water Level Only					
Well / Ground Level (ft)	Depth to Water Level ft.				
	2019	2020	2021	2022	2023
MMC-IRI-11 / 6613.6	468.00	468.30	468.80	469.00	468.80
MWU-2 / 6441.0 (P&A 2023)	197.50	195.90	196.00	196.60	196.50
MWA-2 / 6441.0 (P&A 2023)	199.40	199.40	199.60	200.00	200.00
MWB-2 / 6441.0 (P&A 2023)	255.40	256.00	257.20	257.50	259.10
MWD-1 / 6467.0 (P&A 2023)	329.50	329.90	329.70	330.30	330.90
MWD-2 / 6641.0 (P&A 2023)	254.30	254.80	254.70	255.50	256.00
TH75-6A / NA	296.40	298.56	298.65	299.06	299.06
TH75-6B / NA	294.30	295.93	295.94	296.67	246.67
TH75-11A / NA	413.80	413.03	411.27	404.35	NS
TH75-11B / NA	494.80	495.55	496.02	485.53	NS

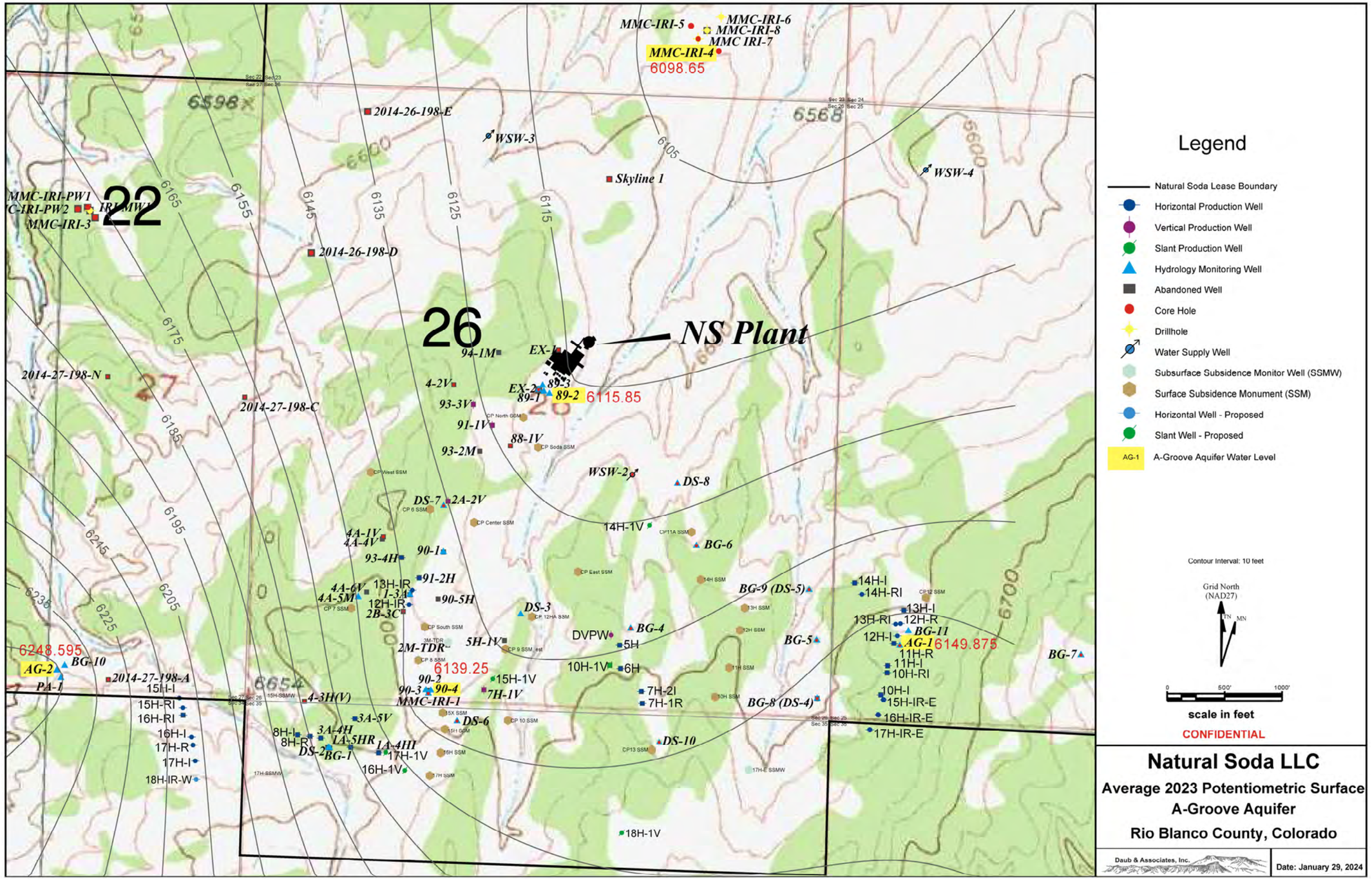
NOTES:

The MWU-2, MWA-2, MWB-2, MWD-1, & MWD-2 wells were P&A'ed in the Summer of 2023.

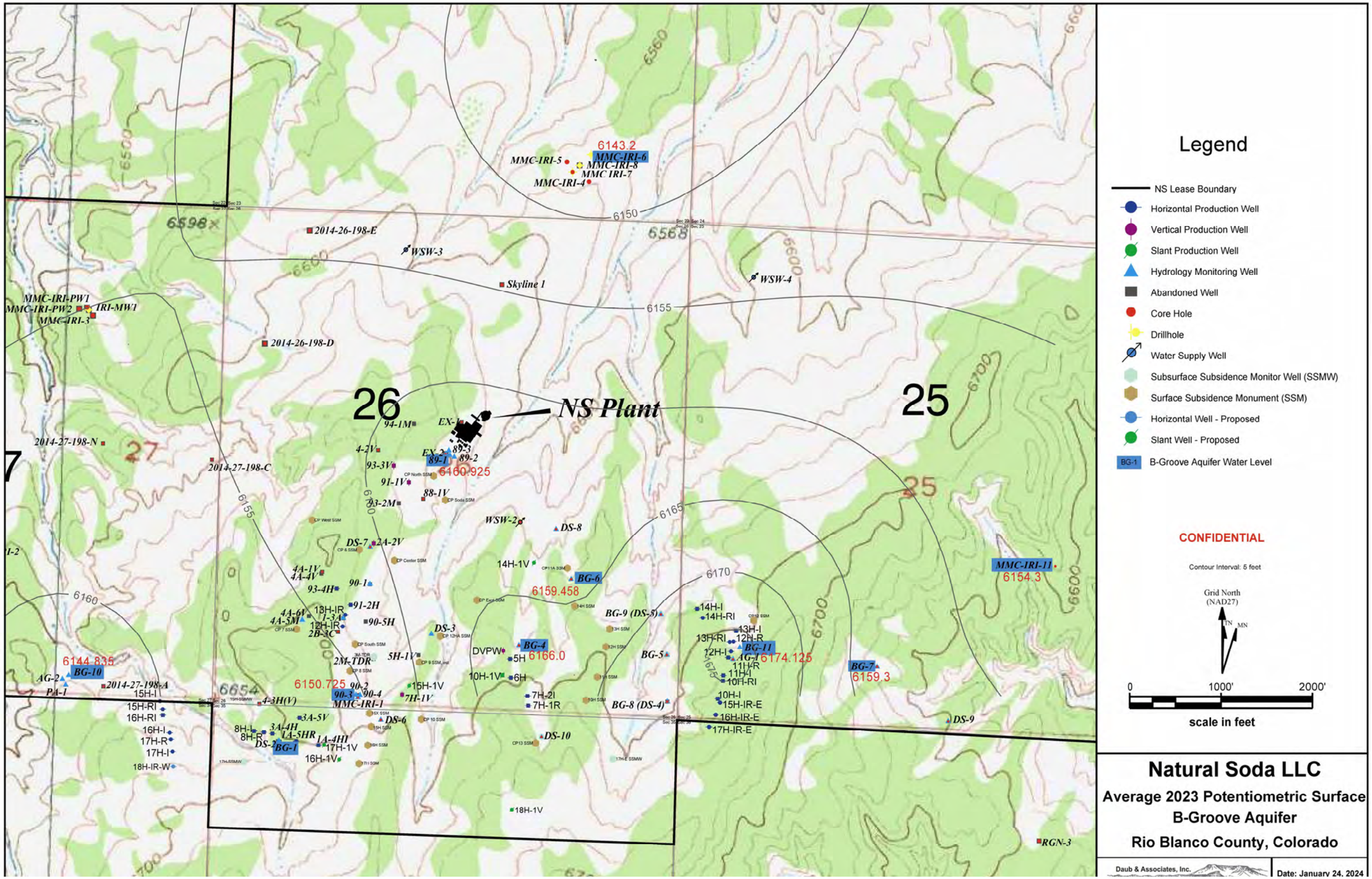
The TH75-11A and TH75-11B wells were not measured for water level due to extenuating circumstance in 2023. The issue preventing measurement will be corrected and a 2024 measurement will be taken.

Natural Soda LLC

Appendix B: 2023 Potentiometric Surface Maps (Confidential)



Appx. Figure B-1: NS Average 2023 Potentiometric Surface A-Groove Aquifer (CONFIDENTIAL)



Appx. Figure B-2: NS Average 2023 Potentiometric Surface B-Groove Aquifer (CONFIDENTIAL)

Natural Soda LLC

Appendix C: 2023 Vegetation Monitoring & Reclamation Status Report

Prepared

By

Rusty Roberts

Reclamation Status Report
2023 Vegetation Monitoring Results for Reclaimed Sites

Evaluating Status of Current Plant Communities on Six Reclaimed Sites in meeting Criteria for Successful Reclamation

Prepared for:
Natural Soda
Rifle, Colorado

Prepared by:
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Meeker, Colorado

December 2023

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Introduction

The Bureau of Land Management (BLM) and the State of Colorado require reclaimed lands to be revegetated in a manner that establishes a diverse, effective, and long-lasting vegetation cover that is equal or nearly so to the natural vegetation of the surrounding areas. Natural Soda's approved mine plan requires periodic monitoring to evaluate the success of revegetation efforts.

Vegetation cover, species composition, species density and ground cover data were collected from undisturbed reference area sites on Natural Soda's lease area near their current mining operations. The data collected from undisturbed areas is used as a baseline for evaluation of the vegetation cover, species composition, species density and ground cover data collected from reclaimed sites to determine if a site has met the criteria for successful reclamation.

Vegetative data was collected between October 6 through October 16, 2023, for six reclaimed pad sites in final reclamation status and for four undisturbed areas. The baseline data from undisturbed areas was collected from four native rangeland reference area sites on Natural Soda's lease area near the reclaimed sites being evaluated. Table 1 lists the six sites in final reclamation status for which data was collected in 2023.

Criteria for Successful Reclamation of Disturbed Areas

The approved criteria for successful reclamation must reflect a plant community of at least five desirable plant species where no one species may exceed 70 percent relative cover and desired foliar cover, bare ground, and shrub and/or forb density must have 80 percent similarity in relation to the identified desired plant community.

The desired plant community referenced in the criteria refers to an ecological site present at or near the area of disturbance. Two ecological sites occur on the parts of the lease area being actively mined, a pinyon and juniper woodland site and a rolling loam rangeland site. The vegetative values in the criteria are based on the capability of a site in an early seral plant community, which is basically an herbaceous species dominated site with varying amounts of shrub species. The rolling loam rangeland site reflects more of the capability of a site in an early seral plant community, thus, data collected from the four-rolling loam native rangeland reference areas were used to evaluate the success of the plant community on each reclaimed site in achieving the reclamation criteria.

Vegetation Sampling Methods Utilized to Measure Criteria for Successful Reclamation

Data was collected based upon recommendations in White River Field Office's Surface Reclamation Plan which require that vegetation cover, composition, and diversity data be gathered using quantitative methods to measure the six Core Terrestrial Indicators and Methods in BLM Technical Note 440. BLM approved sampling methods are found in Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start.

The six core terrestrial indicators include:

(1) Bare Ground: The amount of bare ground is accepted as one of the most sensitive indicators of resource condition in rangelands. A large percentage of bare ground can be an indicator of high erosion potential, low forage production, poor wildlife habitat, and increased risk of invasion by nonnative plant species.

(2) Vegetation Composition: Vegetation composition data, including the cover of groups of species are indicators generated from the same data, and when used together, are sensitive to most changes and are useful when determining the status of key species in a plant community.

(3) Nonnative Invasive Plant Species: The presence and cover of nonnative species is acquired as a component of vegetation composition. Nonnative invasive species can have the ability to significantly alter sustainability and site resilience.

(4) Plant Species of Management Concern: The presence and cover of plant species of management concern is also acquired as a component of vegetation composition. Plant species of management concern can be sensitive to site disturbance, provide important ecosystem functions, or contribute to biological diversity.

(5) Vegetation Height: The vertical structure of vegetation which can be used to characterize wildlife habitat and estimate wind erosion potential.

(6) Proportion of Soil Surface in Large Intercanopy Gaps: Canopy gap intercept measures the proportion of a line covered by large gaps between plant canopies and is an important indicator of the potential for erosion.

Line-point intercept with plot-level species inventory was the vegetation monitoring technique used to measure the core indicators of bare ground, vegetation composition, non-native invasive plant species and plant species of management concern.

Line-point intercept is a rapid, accurate method for quantifying soil cover, including vegetation, litter, rocks and biological crusts. The theory behind this method is that if an infinite number of points are placed in a two-dimensional area, the cover of a plant species can be determined by counting the number of points that hit that species. These measurements are related to wind and water erosion, water infiltration, and the ability of the site to resist and recover from disturbance.

Gap intercept measurements were made along the line-point intercept transect line to provide information about the proportion of the line covered by large gaps between plants. Large gaps between plant canopies are important indicators of increased susceptibility to water erosion and runoff, wind erosion, weed invasion, and wildlife habitat.

A plot-level plant species inventory provides a rapid estimate of species richness. A search area at each site was utilized to record all plant species occurring within the plot. A thorough search of the plot can detect less-frequently occurring species that may not have been recorded in line-point intercept cover measurements.

Shrub and forb densities, also a criterion for successful reclamation, are not measured by the sampling methods used for the other criteria. Forb and shrub density measurements were taken from one-meter square density quadrants along the same line-point intercept transect line used for the other sampling techniques.

Summary of Results for Reclaimed Sites in Achieving Reclamation Goals

Vegetation cover, plant species composition, ground cover and shrub and forb density data were collected from the six well pad sites in final reclamation status and from four native rangeland reference area sites near the reclaimed sites being evaluated. Data was collected between October 6 through October 16, 2023. Table 1 lists the sites in final reclamation status for which data was collected in 2023. The location of sites from which vegetative data was collected are illustrated on the attached location maps.

Table 1 is a summary of the progress of each site monitored in achieving successful reclamation. The site-specific monitoring results for each site will be discussed in detail later.

Table 1 - Summary of Results for Reclaimed Sites in Achieving Successful Reclamation Criteria

Site	Criteria for Successful Reclamation of Disturbed Areas						Criteria Met
	at least five desirable plant species where no one species may exceed 70 percent relative cover		desired foliar cover, bare ground, and shrub and/or forb density must have 80 percent similarity in relation to the values measured on nearby undisturbed native rangelands				
	the number of desired plant species present	the relative cover of the desired species with the greatest cover	% similarity of desired foliar cover	% similarity of bare ground	% similarity of shrub density	% similarity of forb density	
	2023 Data Collected for Sites in Final Reclamation Status						
Pad 93-2M	15 species	18.7%	88%	99%	39%	14%	No
Pad BG-8	21 species	28.8%	75%	122%	27%	3%	No
Pad G	30 species	15.3%	96%	127%	67%	96%	Yes
Pads IRI-3+	17 species	16.7%	85%	96%	6%	38%	No
Pad T	20 species	6.7%	50%	80%	78%	40%	No
Pad U	12 species	8.7%	50%	86%	52%	10%	No
	2023 Baseline Data Collected from Native Rangeland Reference Areas						
	26 species	18.5%	63.0%	23.0%	1.70%	3.65%	

Note: values in red are below the criteria required for successful reclamation

Vegetation Sampling Methods and Procedures for Reclaimed Sites and Reference Areas

The line-point intercept with plot-level species inventory was the vegetation sampling protocol used on both the reclaimed sites and associated reference areas. The procedure involves random placement of a transect line (measuring tape) as the base for data collection. Values for foliar cover, basal cover, species composition and bare ground were measured at specific points along the line. Gaps in vegetation canopy were measured along the same tape line. Density quadrants were placed adjacent to the line at specific points.

A 25-meter tape was used as the baseline transect for collecting data from the 4 rolling loam reference areas and from the 6 reclaimed sites. One transect line was used to collect data from each of the 4 reference areas. Three transect lines were used to collect data from each of the 6 reclaimed sites.

The following techniques were used to collect the sample data:

- The beginning and ending points of each transect were recorded using a GPS receiver. Azimuths from the 0-meter to the 25-meter point were recorded.
- Photographs were taken at each transect that show vegetation features at the time of sampling.
- Point count data were collected at one half-meter intervals along a 25-meter tape using a thin, straight metal rod (pin flag) for a total of fifty samples taken along each transect.
    - The first plant species in the canopy hit by the drop of a pin flag at each sample point was recorded by species in the "Top Layer". The total of top layer hits was used to determine the total foliar cover for the study site and the total foliar cover for each species hit in the top layer.
    - Subsequent plant species encountered at each sample point and vegetative litter hits were recorded in the "Lower Canopy Layers". Vegetative litter was recorded as either unattached herbaceous or woody litter.
    - Species composition based upon total of all plant species encountered in the top layer and the lower layers at each sample point and recorded by species and summarized by plant group.
    - Soil surface hits were recorded as plant species basal intercepts, lichen crust, moss, embedded litter, duff, rock, or bare soil. Bare ground percent was determined by a bare soil hit with no canopy intercepts in the top and lower canopy layers.
- Canopy gaps were recorded directly below the transect tape line. Only perennial plant species were used in the vegetative canopy. Non-native species if present were not included as part of the canopy. Gaps larger than 20 centimeters were recorded for the length of each transect. Gaps were totaled into gap sizes (21 to 50; 51 to 100; 101 to 200; >200). Though the gap data is not used in evaluating reclamation criteria, it was collected as a visualization of perennial species distribution and cover.
- Forb and shrub density data were taken from one-meter square density quadrants alongside the same line-point intercept transect line used for the other sampling techniques. Quadrants were placed at every 5th sample point along the transect tape for a total of 10 one-meter density quads for each transect. Only desirable forb and shrub densities are required in the criteria for successful reclamation. The total number of desirable forb and shrub species rooted in each quad were counted and recorded by species and summarized by plant group. Densities for grasses or trees were not collected.
- A plot-level plant species inventory was conducted within a search area at each site. The search area for reclaimed sites was within the original disturbance at the site. In addition to those plant species recorded during sampling, other species not encountered during sampling but were observed in the sample area were recorded for species richness.

Vegetation Sampling Results for Nearby Native Rangeland Reference Areas

Vegetation cover, species composition, species density and ground cover data were collected from four rolling loam rangeland sites from October 6 through October 16, 2023. Transects were established in the 4 rolling loam sites which represent the site characteristics near the reclaimed sites being evaluated. The vegetative data collected from the 4 reference areas were used to evaluate the success of the plant community on each reclaimed site in achieving the reclamation criteria.

Values for foliar cover, basal cover, species composition and bare ground were collected from four 25 meter transects for a total of 200 sample points. Values for forb and shrub densities were collected from 40 one-meter square quadrants. Table 2 summarizes the data collected in 2023 in comparison to the data that was collected in 2022.

Table 2- Rolling Loam Native Rangeland Reference Area
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m²)	
Plant Group	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Perennial Grasses	5	7	38.5	42.0	6.5	8.0	63.45	60.38	n/a	n/a
Invasive Non-Native Grasses	1	1	4.0	4.0	0	0	6.9	6.29	n/a	n/a
Desirable Forbs	22	13	4.5	7.0	0	0	8.97	12.58	5.03	3.65
Invasive and Non-Native Forbs	1	2	0	1.5	0	0	0	1.89	n/a	n/a
Shrubs	5	6	13.5	14.0	0.5	0	20.68	18.87	1.74	1.70
Vegetation Totals	**34**	**29**	**60.5**	**68.5**	**7.0**	**8.0**	**100.0**	**100.0**	**6.77**	**5.35**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
	27.5	**23.0**	**2.5**	**0.0**	**38.0**	**48.0**	**2.5**	**4.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Sum of data from 4 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The data collected from the 4 reference areas showed an increase in foliar cover of all plant groups except for non-native grasses. The cover of non-native grasses remained constant with that measured in 2022. No cover of non-native forb species was recorded in 2022 but they accounted for 2 percent of the total cover measured in 2023.

Foliar cover of desirable species increased 12 percent above values measured in 2022. Foliar cover of perennial grasses increased 9 percent and shrub cover increased 4 percent. The cover of desirable forbs increased 56 percent from values measured in 2022.

Even though the desirable forbs showed a significant increase in foliar cover in 2023, their densities declined 27 percent. Likewise, there were 22 species of desirable forbs noted in the study areas in 2022 compared to only 13 in 2023, a 40 percent decline.

The decline in desirable forb species in 2023 is most likely due to the October data collection versus the September data collection of 2022. Lot of the forb species not observed in October are early maturing species that have completed their seasonal growth, and their above ground presence has withered.

There was a 16 percent decline in the amount of bare ground measured in 2023 because of a 21 percent increase in amount of herbaceous litter and the 13 percent increase in total foliar cover. The canopy gaps between perennial species, also an indicator of ground cover, declined 14 percent in 2023.

The specific vegetation sampling data collected from the 4 rolling loam rangeland sites are presented in Appendix A. Data in the appendix include (1) vegetation cover, ground cover, species composition, and forb and shrub densities; (2) the scientific and common names of each plant species encountered; (3) GPS coordinate data for the transect start and end points; (4) inter-canopy gaps and (5) photographs of each transect.

Monitoring Results and Evaluation of Criteria for Sites in Final Reclamation Status

Vegetation cover, species composition, species density and ground cover data were collected from the area of disturbance for 6 sites in final reclamation status (pads 93-2M, BG-8 and corehole pads G, IRI-3+, T and U). Locations are noted on the attached location maps.

Vegetation sampling data collected for the 6 reclaimed sites are presented in Appendix B through Appendix G.

- Appendix B – reclaimed pad 93-2M.
- Appendix C – reclaimed pad BG-8.
- Appendix D – reclaimed corehole pad G.
- Appendix E – combined reclaimed corehole pads IRI-3, MW-1, PW-1, PW-2.
- Appendix F – reclaimed corehole pad T.
- Appendix G – reclaimed corehole pad U.

Vegetation sampling data in the appendixes include (1) vegetation cover, ground cover, species composition, and forb and shrub densities; (2) the scientific and common names of each plant species encountered; (3) GPS coordinate data for the transect start and end points; (4) inter-canopy gaps and (5) photographs of each transect.

Well Pad 93-2M

Data was collected for this site on October 6, 2023. Three 25 meter transects were placed in a spoke pattern on the pad with 50 sample points on each transect for cover data. Ten one-meter square density quadrants were placed along each transect. Data collected from this site includes vegetative foliar and basal cover, species composition, forb and shrub densities all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground, and surface rock.

The data collected in 2023 is summarized in Table 3 from the sampling data presented in Appendix Table B1. Each plant species encountered at this site is listed in Table B1. As shown in Table B1 there is a good establishment of the perennial grasses with uniform distribution across much of the site.

The value for foliar cover, basal cover, species composition and bare ground were collected from three 25 meter transects for a total of 150 sample points. Values for forb and shrub densities were collected from 30 one-meter square quadrants. Table 3 summarizes the data collected in 2023 in comparison to the data that was collected in 2022.

Table 3 - Reclaimed Pad 93-2M
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m²)	
Plant Group	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Perennial Grasses	8	8	39.4	45.3	6.0	6.7	65.96	72.45	n/a	n/a
Invasive Non-Native Grasses	1	1	8.0	4.7	0.0	0.0	19.15	9.18	n/a	n/a
Desirable Forbs	3	3	0.7	2.7	0.0	0.0	1.06	4.08	0.33	0.50
Invasive and Non-Native Forbs	1	2	2.7	2.0	0.0	0.0	4.26	3.06	n/a	n/a
Shrubs	4	4	6.0	7.3	0.0	0.0	9.57	12.24	1.00	0.67
Vegetation Totals	**17**	**18**	**56.8**	**62.0**	**6.0**	**6.7**	**100.0**	**100.0**	**1.33**	**1.17**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
	28.0	**23.3**	**0.0**	**0.0**	**56.3**	**56.0**	**1.3**	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Sum of data from 3 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The data collected from this site in 2023 showed an increase in foliar cover for desirable species and declines for non-native grasses and non-native forb species. Foliar cover of desirable species increased 20 percent above values measured in 2022. The foliar cover of perennial grasses increased 15 percent and shrub cover increased 22 percent. The cover of desirable forbs nearly trebled from values measured in 2022.

The cover for non-native grasses declined 41 percent and non-native forb species declined 26 percent in 2023. In comparison with reference areas the cover of non-native grasses was 18 percent greater and non-native forb species cover was 33 percent greater.

In 2023, the densities of desirable forb species increased 34 percent and the densities of shrubs decreased 33 percent. In comparison with reference areas, desirable forb species were only 14 percent of that on the reference areas and shrub densities were 39 percent of that on the reference areas.

There was a 17 percent decline in the amount of bare ground measured in 2023 because of a one percent increase in amount of herbaceous litter and the nine percent increase in total foliar cover.

The canopy gaps between perennial species, also an indicator of ground cover, declined 24 percent in 2023.

The foliar cover of desirable species on the site was 12 percent less than that measured on the reference areas. In comparison with values measured on the reference areas, the cover of perennial grasses was 8 percent greater, and their composition was 4 percent greater. The cover non-native grass was 18 percent greater and non-native forb species was 33 percent greater than measured on the reference areas.

Both the cover and composition of desirable forbs and shrubs were well below that on the reference areas, only 39 percent for forbs and 48 percent for shrubs. The density of desirable forbs on the site was 14 percent and the density of shrubs was 39 percent of that on reference areas.

The amount of bare ground on this site was only 1 percent greater than that measured on the reference areas. The amount of herbaceous litter on this site was 14 percent greater than that on the reference areas. The canopy gaps between perennial species were 2 percent larger on the reference areas than measured on this site.

Table 4 is a comparison of the data collected for reclaimed well pad 93-2M with that of the rolling loam rangeland reference areas. Only the data required to access the success of achieving successful reclamation is used in Table 4.

Table 4 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Reclaimed Pad 93-2M	15 species	55.3	23.3	0.67	0.50
Reference Area [1]	26 species	63.0	23.0	1.70	3.65

[1] *The average of four native rangelands reference areas were used as the baseline for evaluating success of the reclamation criteria.*

Evaluation of the reclamation efforts of the disturbance on Well Pad 93-2M:

- There are 15 desirable plant species established on the site (8 perennial grasses, 3 desirable forbs, and 4 shrubs) meeting the requirement of at least five plant species.
- Russian wildrye *(Psathyrostachys juncea*) was the desired species with the greatest relative cover at 18.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 88 percent of that on the native rangeland reference area exceeding the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 1 percent greater than that on the native rangeland reference area which equates to 99 percent similarity, exceeding the required 80 percent similarity.
- The density of desirable forbs and shrubs on the site in comparison with the native rangeland reference areas was 14 percent and 39 percent, respectively. Neither forb density nor shrub density have met the requirement of 80 percent similarity.

The plant community does meet the criteria for species diversity, desired foliar cover, and the amount of bare ground. The site does not meet the criteria for the densities of desirable forbs or shrubs. This site does not meet all the criteria for successful reclamation of the disturbance at the site.

Pad BG-8

Data was collected for this site on October 6, 2023. Three 25 meter transects were placed in a spoke pattern on the pad with 50 sample points on each transect for cover data. Ten one-meter square density quadrants were placed along each transect. Data collected from this site includes vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground, and surface rock.

The value for foliar cover, basal cover, species composition and bare ground were collected from three 25 meter transects for a total of 150 sample points. Values for forb and shrub densities were collected from 30 one-meter square quadrants. The data collected in 2023 is summarized in Table 5 from the sampling data presented in Appendix Table C1. Each plant species encountered at this site is listed in Table C1. Table 5 summarizes the data collected in 2023 in comparison to the data that was collected in 2022.

Table 5 - Reclaimed Pad BS-8
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m²)	
Plant Group	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Perennial Grasses	9	10	41.4	46.7	12.0	10.0	66.00	63.97	n/a	n/a
Invasive Non-Native Grasses	1	1	4.7	8.0	0.0	0	8.00	12.61	n/a	n/a
Desirable Forbs	5	6	0.0	0.7	0.0	0	0.0	1.80	0.12	0.10
Invasive and Non-Native Forbs	1	2	14.0	8.7	0.0	0	24.00	13.51	n/a	n/a
Shrubs	4	5	1.4	6.0	0.0	0	2.00	8.11	0.50	0.46
Vegetation Totals	**20**	**24**	**61.5**	**70.1**	**12.0**	**10.0**	**100.0**	**100.0**	**0.62**	**0.56**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
	28.7	**18.0**	**0.0**	**0.0**	**31.3**	**55.3**	**2.0**	**1.3**	**0.0**	**0.0**	**1.3**	**1.3**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The data collected from this site in 2023 showed an increase in foliar cover for desirable species. Foliar cover of desirable species increased 20 percent above values measured in 2022. The foliar

cover of perennial grasses increased 13 percent. Both shrub cover and cover of desirable forbs showed significant increases in 2023. Shrub cover increased 3 times and desirable forb cover increased 6 times above values measured in 2022.

The cover for non-native grasses increased 70 percent and cover of non-native forb species declined 38 percent of the values measured in 2022. In comparison with reference areas the cover of non-native grasses was 2 times greater and non-native forb species cover was nearly 5 times greater.

In 2023, the densities of desirable forb species declined 17 percent and the densities of shrubs declined 8 percent. In comparison with reference areas, desirable forb species were only 3 percent of that on the reference areas and shrub densities were 27 percent of that on the reference areas.

There was a 37 percent decline in the amount of bare ground measured in 2023 because of a 43 percent increase in amount of herbaceous litter and the 14 percent increase in total foliar cover. The canopy gaps between perennial species, also an indicator of ground cover, declined 28 percent in 2023.

In comparison with values measured on the reference areas, the foliar cover of desirable species on the site was 15 percent less. The cover non-native grass was 100 percent greater and non-native forb species was nearly 5 times greater than measured on the reference areas.

The amount of bare ground on this site was 22 percent below that measured on the reference areas. The amount of herbaceous litter on this site was 10 percent greater than that on the reference areas. The canopy gaps between perennial species were 1 percent larger on the reference areas than measured on this site.

Table 6 is a comparison of the data collected for reclaimed Pad BG-8 with that of the rolling loam rangeland reference areas. Only the data required to access the success of achieving successful reclamation is used in Table 6.

Table 6 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Reclaimed Pad BS-8	21 species	53.4	18.0	0.46	0.10
Reference Area [1]	26 species	63.0	23.0	1.70	3.65

[1] *The average of four native rangelands reference areas were used as the baseline for evaluating success of the reclamation criteria.*

Evaluation of the reclamation efforts of the disturbance on Pad BG-8:

- There are 21 desirable plant species established on the site (10 perennial grasses, 6 desirable forbs, and 5 shrubs) meeting the requirement of at least five plant species.

- Slender wheatgrass (*Elymus trachycaulus*) was the desired species with the greatest relative cover at 28.8 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 75 percent of that on the native rangeland reference areas not meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 22 percent less than that on the native rangeland reference areas which equates to 122 percent similarity, meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 3 percent and 27 percent, respectively. Neither forb density nor shrub density have met the requirement of 80 percent similarity.

The plant community meets only the species diversity and bare ground criteria but not the desired foliar cover, shrub density and desirable forb density criteria necessary for successful reclamation of the disturbance at this site. This site does not meet all the criteria for successful reclamation of the disturbance at the site.

Corehole Pad G

Vegetation sampling data was collected on October 10, 2023. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for cover data. Ten one-meter square density quadrants were placed along each transect. Data collected from this site includes vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground, and surface rock.

The value for foliar cover, basal cover, species composition and bare ground were collected from three 25 meter transects for a total of 150 sample points. Values for forb and shrub densities were collected from 30 one-meter square quadrants. Table 7 summarizes the data collected in 2023 in comparison to the data that was collected in 2022. The 2023 data in Table 7 is summarized from data presented in Appendix Table D1. Each plant species encountered at this site is listed in Table D1.

Table 7 - Reclaimed Exploration Pad G
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m^2)	
Plant Group	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Perennial Grasses	9	9	33.3	47.3	7.4	8.0	53.62	67.21	n/a	n/a
Invasive Non-Native Grasses	1	1	3.3	3.3	0.0	0	8.25	7.38	n/a	n/a
Desirable Forbs	17	15	3.4	6.0	0.0	0.7	6.18	10.66	3.0	3.50
Invasive and Non-Native Forbs	1	2	13.3	5.4	0.0	0	23.71	6.55	n/a	n/a
Shrubs	6	6	5.4	6.0	0.0	0.7	8.24	8.20	1.04	0.67
Vegetation Totals	**34**	**33**	**58.7**	**68.0**	**7.4**	**9.4**	**100.0**	**100.0**	**4.04**	**4.17**
Line-Point Intercept Soil Surface Cover Data [3]										

Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
	30.7	16.7	0.0	0.0	23.7	58.7	4.0	4.7	0.0	0.0	0.0	0.0

[1] Sum of data from 3 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The data collected from this site in 2023 showed a 29 percent increase in foliar cover for desirable species above values measured in 2022. The foliar cover of perennial grasses increased 30 percent. Both shrub cover and cover of desirable forbs showed increases in 2023. Shrub cover increased 10 percent and desirable forbs cover increased 43 percent above values measured in 2022. In comparison with values measured on the reference areas, the foliar cover of desirable species on the site was 96 percent of that on the reference areas.

The cover for non-native grasses remained constant and cover of non-native forb species declined 59 percent of the values measured in 2022. In comparison with reference areas, the cover of non-native grasses was 18 percent less than and non-native forb species cover was 2.6 times greater than the values measured on the reference areas.

In 2023, the densities of desirable forb species increased 14 percent and the densities of shrubs declined 36 percent of the values measured in 2022. In comparison with reference areas, desirable forb species were 96 percent of that on the reference areas and shrub densities were 61 percent of that on the reference areas.

There was a 46 percent decline in the amount of bare ground measured in 2023 because of a 60 percent increase in amount of herbaceous litter and the 16 percent increase in total foliar cover. The canopy gaps between perennial species, also an indicator of ground cover, declined 28 percent in 2023.

The amount of bare ground on this site was 27 percent below that measured on the reference areas. The amount of herbaceous litter on this site was 18 percent greater than that on the reference areas. The canopy gaps between perennial species were 4 percent larger on this site than on the reference areas.

Table 8 is a comparison of the data collected for corehole pad G with that from the rolling loam rangeland reference areas. Only the data required to access the success of achieving successful reclamation is used in Table 8.

Table 8 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole Pad G	30 species	59.3	16.7	0.67	3.50
Reference Area [1]	26 species	63.0	23.0	1.70	3.65

[1] *The average of four native rangelands reference areas were used as the baseline for evaluating success of the reclamation criteria.*

Evaluation of the reclamation efforts of the disturbance on Corehole Pad G:

- There are 30 desirable plant species established on the site (9 perennial grasses, 15 desirable forbs, and 6 shrubs) meeting the requirement of at least five plant species.
- Slender wheatgrass (*Elymus trachycaulus*) was the desired species with the greatest relative cover at 15.3 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 96 percent of that on the native rangeland reference areas, meeting the required 80 percent similarity.
- The amount of unprotected bare ground on the site was 27 percent less than that on the native rangeland reference areas which equates to 127 percent similarity, exceeding the required 80 percent similarity.
- The density of desirable forbs and shrubs on the site in comparison with the native rangeland reference areas was 96 percent and 67 percent, respectively. The criteria only require either desirable forbs density or shrub density meet the requirement of 80 percent similarity. The desirable forbs density of 96 percent similarity has met the required criteria.

The plant community on this site does meet the criteria for species diversity, desired foliar cover, desirable forb density and bare ground. This site does meet all the criteria for successful reclamation of the disturbance at the site.

Corehole Pads IRI-3, MW-1, PW-1, PW-2

This site includes corehole pads IRI-3, MW-1, PW-1, and PW-2. Vegetation sampling data was collected on October 10, 2023. Three 25 meter transects were randomly placed on the site with 50 sample points on each transect for cover data. Ten one-meter square density quadrants were placed along each transect. Data collected from this site includes vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground, and surface rock.

The 2023 data in Table 9 is summarized from data presented in Appendix Table E1. Each plant species encountered at this site is listed in Table E1. As shown in Table E1 there is a good representation of the seeded species established on the site.

The value for foliar cover, basal cover, species composition and bare ground were collected from three 25 meter transects for a total of 150 sample points. Values for forb and shrub densities were collected from 30 one-meter square quadrants. Table 9 summarizes the data collected in 2023 in comparison to the data that was collected in 2022.

Table 9 - Reclaimed Corehole Pads IRI-3, MW-1, PW-1, and PW-2
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m²)	
Plant Group	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Perennial Grasses	9	7	42.7	50.0	6.1	10.0	83.75	89.65	n/a	n/a
Invasive Non-Native Grasses	1	1	6.0	2.0	0.0	0.0	11.25	3.45	n/a	n/a
Desirable Forbs	9	6	0.0	0.0	0.0	0.0	0.0	0.0	1.14	0.23
Invasive and Non-Native Forbs	1	1	0.0	0.7	0.0	0.0	0.0	1.15	n/a	n/a
Shrubs	4	4	2.7	3.3	0.0	0.0	5.00	5.75	0.76	0.64
Vegetation Totals	**24**	**19**	**51.4**	**56.0**	**6.1**	**10.0**	**100**	**100.0**	**1.90**	**0.87**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
	39.3	**24.0**	**0.0**	**0.0**	**31.3**	**58.0**	**0.6**	**0.7**	**0.0**	**0.0**	**1.3**	**0.7**

[1] Sum of data from 3 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The data collected from this site in 2023 showed a 17 percent increase in foliar cover for desirable species above values measured in 2022. The foliar cover of perennial grasses increased 15 percent. The shrub cover increased 18 percent. As in 2022, no foliar cover of desirable forbs was recorded in the data collected in 2023. In comparison with values measured in 2023, the foliar cover of desirable species on this site was 85 percent of that on the reference areas.

The cover for non-native grasses declined 67 percent of the values measured in 2022. There was no foliar cover of non-native forb species recorded in 2022, however in 2023, their cover accounted for 1.3 percent of the cover values measured. In comparison with reference areas, the cover of non-native grasses was 50 percent below and non-native forb species cover was 53 percent below the values measured on the reference areas.

In 2023, the densities of desirable forb species declined 80 percent and the densities of shrubs declined 16 percent of the values measured in 2022. In comparison with reference areas, desirable forb species were 6 percent of that on the reference areas and shrub densities were 38 percent of that on the reference areas.

There was a 39 percent decline in the amount of bare ground measured in 2023 because of a 46 percent increase in amount of herbaceous litter and the 8 percent increase in total foliar cover. The canopy gaps between perennial species, also an indicator of ground cover, declined 12 percent in 2023.

The amount of bare ground on this site was 4 percent above that measured on the reference areas. The amount of herbaceous litter on this site was 17 percent greater than that on the reference areas. The canopy gaps between perennial species were 15 percent larger on this site than on the reference areas.

Table 10 is a comparison of the data collected for exploration corehole pad IRI-3, MW-1, PW-1 and PW-2 with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 10.

Table 10 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole IRI-3, MW-1, PW-1 and PW-2	17 species	53.3	24.0	0.64	0.23
Reference Area [1]	26 species	63.0	23.0	1.70	3.65

[1] *The average of four native rangelands reference areas were used as the baseline for evaluating success of the reclamation criteria.*

Evaluation of the reclamation efforts of the disturbance on Corehole Pads IRI-3, MW-1, PW-1, and PW-2:

- There are 17 desirable plant species established on the site (7 perennial grasses, 6 desirable forbs, and 4 shrubs) meeting the requirement of at least five plant species.
- Russian wildrye (*Psathyrostachys juncea*) was the desired species with the greatest relative cover at 16.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 85 percent of that on the native rangeland reference areas meeting the 80 percent similarity criteria.
- The amount of unprotected bare ground on this site was 96 percent of that on the native rangeland reference meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 6 percent and 38 percent, respectively. Neither desirable forbs nor shrub densities have met the requirement of 80 percent similarity.

The plant community does meet the criteria of species diversity, desired foliar cover, and bare ground, but does not meet the criteria for desirable forb density nor shrub density for successful reclamation of the disturbance at the site. This site does not meet all the criteria for successful reclamation of the disturbance at the site.

Corehole Pad T

Vegetation sampling data was collected on October 16, 2023. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for cover data. Ten one-meter square density quadrants were placed along each transect. Data collected from this site includes vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground, and surface rock.

The value for foliar cover, basal cover, species composition and bare ground were collected from three 25 meter transects for a total of 150 sample points. Values for forb and shrub densities were collected from 30 one-meter square quadrants. The 2023 data in Table 11 is summarized from data presented in Appendix Table F1. Each plant species encountered at this site is listed in Table F1. Table 11 summarizes the data collected in 2023 in comparison to the data that was collected in 2022.

Table 11 - Reclaimed Exploration Pad T
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m^2)	
Plant Group	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Perennial Grasses	7	9	11.4	12.8	4.0	2.0	15.25	21.84	n/a	n/a
Invasive Non-Native Grasses	1	1	6.7	20.0	0.0	0	12.71	33.64	n/a	n/a
Desirable Forbs	9	6	3.3	6.0	0.0	0.7	5.08	9.12	1.93	1.47
Invasive and Non-Native Forbs	1	3	34.0	9.4	0.0	0	52.54	18.18	n/a	n/a
Shrubs	5	5	11.3	12.7	0.0	0.7	14.42	17.22	1.49	1.33
Vegetation Totals	**23**	**24**	**66.7**	**60.9**	**4.0**	**3.4**	**100.0**	**100.0**	**3.42**	**2.81**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
	26.0	**28.7**	**0.0**	**0.0**	**19.3**	**45.3**	**8.0**	**4.7**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Sum of data from 3 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The data collected from this site in 2023 showed a 17 percent increase in foliar cover for desirable species above values measured in 2022. The foliar cover of perennial grasses increased 11 percent, shrub cover increased 11 percent, and foliar cover of desirable forbs increased 45 percent above collected in 2022. In comparison with values measured in 2023, the foliar cover of desirable species on this site was 50 percent of that on the reference areas.

There were significant increases in the cover for non-native species in 2023. Forty-eight (48) percent of the cover measured on this site came from non-native and invasive species. The cover of cheatgrass nearly tripled its value measured in 2022. It accounted for 33 percent of the total foliar cover measured on this site. The cover of non-native forb species declined 72 percent in 2023 but still accounted for 15 percent of the cover measured on this site. In comparison with reference areas, the cover of non-native grasses was 5 times greater, and the cover of non-native forb species was 6 times greater than the values measured on the reference areas.

In 2023, the densities of desirable forb species declined 24 percent and the densities of shrubs declined 11 percent of the values measured in 2022. In comparison with reference areas,

desirable forb species were 40 percent of that on the reference areas and shrub densities were 78 percent of that on the reference areas.

There was a 9 percent increase in the amount of bare ground measured in 2023. However, the canopy gaps between perennial species declined 12 percent in 2023. The amount of bare ground on this site was 20 percent above that measured on the reference areas. The amount of herbaceous litter on this site was 6 percent greater than that on the reference areas. The canopy gaps between perennial species were 38 percent larger on this site than on the reference areas.

There is poor distribution across the site of the perennial species used in the seed mix. Most of the perennial species on the site are a few native grasses and several native forbs and shrubs that have pioneered the site from adjacent stands. The invasive and non-native species on this site accounted for 52 percent of the total species composition.

Table 12 is a comparison of the data collected for exploration corehole pad T with that from the rolling loam rangeland reference areas. Only the data required to access the success of achieving successful reclamation is used in Table 12.

Table 12 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole Pad T	20 species	31.5	28.7	1.34	1.47
Reference Area [1]	26 species	63.0	23.0	1.70	3.65

[1] *The average of four native rangelands reference areas were used as the base for evaluating success of the reclamation criteria.*

Evaluation of the reclamation efforts of the disturbance on Corehole Pad T:

- There are 20 desirable plant species observed on the site (9 perennial grasses, 6 desirable forbs, and 5 shrubs) meeting the requirement of at least five plant species.
- Yellow rabbitbrush (*Chrysothamnus viscidiflorus*) was the desired species with the greatest relative cover at 6.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 50 percent of that on the native rangeland reference areas not meeting the requirement of 80 percent similarity.
- The amount of unprotected bare ground on the site was 20 greater that on the native rangeland reference areas which equates to 80 percent similarity, meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 40 percent and 78 percent, respectively. The criteria only require either forb density or shrub density meet the requirement of 80 percent similarity. Neither desirable forbs nor shrub densities have met the requirement of 80 percent similarity.

The plant community only meets the criteria for species diversity and bare ground. The criteria for the desired foliar cover, desirable forb density and density of shrubs have not been met.

However, shrub density is near the required criteria. This site does not meet all the criteria for successful reclamation of the disturbance at the site.

Corehole Pad U

Vegetation sampling data was collected on October 16, 2023. Three 25 meter transects were randomly placed on the pad with 50 sample points on each transect for cover data. Ten one-meter square density quadrants were placed along each transect. Data collected from this site includes vegetative foliar and basal cover, species composition, forb and shrub densities and ground cover all summarized by plant group. In addition, ground cover data was collected for dead vegetative litter, bare ground, and surface rock.

The value for foliar cover, basal cover, species composition and bare ground were collected from three 25 meter transects for a total of 150 sample points. Values for forb and shrub densities were collected from 30 one-meter square quadrants. The 2023 data in Table 13 is summarized from data presented in Appendix Table G1. Each plant species encountered at this site is listed in Table G1. Table 13 summarizes the data collected in 2023 in comparison to the data that was collected in 2022.

Table 13 - Reclaimed Pad U
Vegetation Cover, Species Composition, Species Density & Ground Cover

	Line-Point Canopy Intercept Data [1]								Density Data [2]	
	Number of Species		% Foliar Cover		% Basal Cover		Species Composition		Forb/Shrub Density (#/m^2)	
Plant Group	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Perennial Grasses	4	5	12.7	15.4	0.7	2.7	23.16	26.00	n/a	n/a
Invasive Non-Native Grasses	1	1	6.7	22.0	0.0	0.0	13.68	34.00	n/a	n/a
Desirable Forbs	3	3	0.7	1.3	0.6	1.3	1.05	3.00	0.5	0.37
Invasive and Non-Native Forbs	1	3	28.0	6.0	0.0	0.0	47.37	14.00	n/a	n/a
Shrubs	5	6	8.7	14.7	0.7	0.7	14.74	23.00	0.9	0.88
Vegetation Totals	**14**	**18**	**56.8**	**59.4**	**2.0**	**4.7**	**100.0**	**100.0**	**1.40**	**1.25**

Line-Point Intercept Soil Surface Cover Data [3]

Percent Cover by Type	Bare Ground		Biotic Crust		Herbaceous Litter		Woody Litter		Duff		Rock	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
	33.3	**26.7**	**0.0**	**0.0**	**26.7**	**54.0**	**5.3**	**4.0**	**0.0**	**0.0**	**0.7**	**0.0**

[1] Sum of data from 3 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from ten 1-meter square quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

The data collected from this site in 2023 showed a 30 percent increase in foliar cover for desirable species above values measured in 2022. The foliar cover of perennial grasses increased 18 percent, shrub cover increased 41 percent, and foliar cover of desirable forbs increased 46 percent above collected in 2022. In comparison with values measured in 2023, the foliar cover of desirable species on this site was 50 percent of that on the reference areas.

There were significant increases in the cover for non-native species in 2023. Forty-seven (47) percent of the cover measured on this site came from non-native and invasive species. The cover of cheatgrass increased 328 percent above its value measured in 2022. It accounted for 37 percent of the total foliar cover measured on this site. The cover of non-native forb species declined 79 percent in 2023 but still accounted for 10 percent of the cover measured on this site. In comparison with reference areas, the cover of non-native grasses was over 5 times greater, and the cover of non-native forb species was 3 times greater than the values measured on the reference areas.

In 2023, the densities of desirable forb species declined 26 percent and the densities of shrubs declined 2 percent of the values measured in 2022. In comparison with reference areas, desirable forb species were 10 percent of that on the reference areas and shrub densities were 52 percent of that on the reference areas.

There was a 20 percent decline in the amount of bare ground measured in 2023. The canopy gaps between perennial species declined 7 percent in 2023. The amount of bare ground on this site was 14 percent above that measured on the reference areas. The amount of herbaceous litter on this site was 11 percent greater than that on the reference areas. The canopy gaps between perennial species were 41 percent larger on this site than on the reference areas.

There is poor distribution across the site of the perennial species used in the seed mix. Most of the perennial species on the site are a few native grasses and several native shrubs that have pioneered the site from adjacent stands. The invasive and non-native species on this site accounted for 48 percent of the total species composition.

Table 14 is a comparison of the data collected for corehole pad U with that from the rolling loam rangeland reference area. Only the data required to access the success of achieving successful reclamation is used in Table 14.

Table 14 – Comparison of Reclamation Criteria Elements with Native Rangeland Reference Areas

Site	# desired plant species	% desired foliar cover	% bare ground	shrub density (#/m^2)	forb density (#/m^2)
Corehole Pad U	12 species	31.4	26.7	0.88	0.37
Reference Area [1]	26 species	63.0	23.0	1.70	3.65

[1] *The average of four native rangelands reference areas were used as the baseline for evaluating success of the reclamation criteria.*

Evaluation of the reclamation efforts of the disturbance on Corehole Pad U:

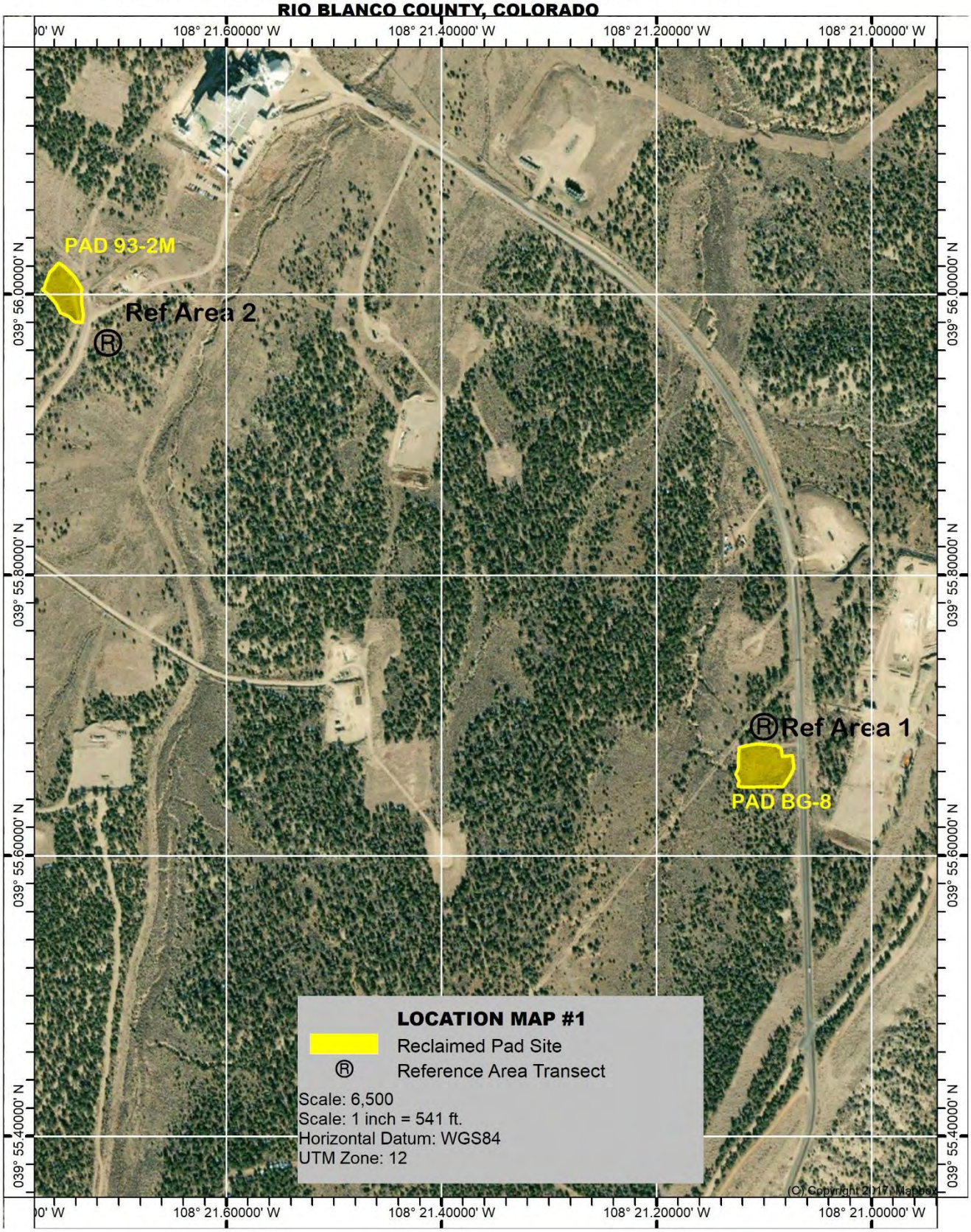
- There are 12 desirable plant species established on the site (5 perennial grasses, 3 desirable forbs, and 6 shrubs) meeting the requirement of at least five plant species.
- Western wheatgrass (*Pascopyrum smithii*) was the desired species with the greatest relative cover at 8.7 percent meeting the requirement that no one species can exceed 70 percent relative cover.
- The foliar cover of desirable species on the site was 50 percent of that on the native rangeland reference areas not meeting the requirement of 80 percent similarity.

- The amount of unprotected bare ground on the site was 14 percent greater than on the native rangeland reference areas which equates to 86 percent similarity, meeting the required 80 percent similarity.
- The density of forbs and shrubs on the site in comparison with the native rangeland reference areas was 10 percent and 52 percent, respectively. Neither desirable forbs nor shrub densities have met the requirement of 80 percent similarity.

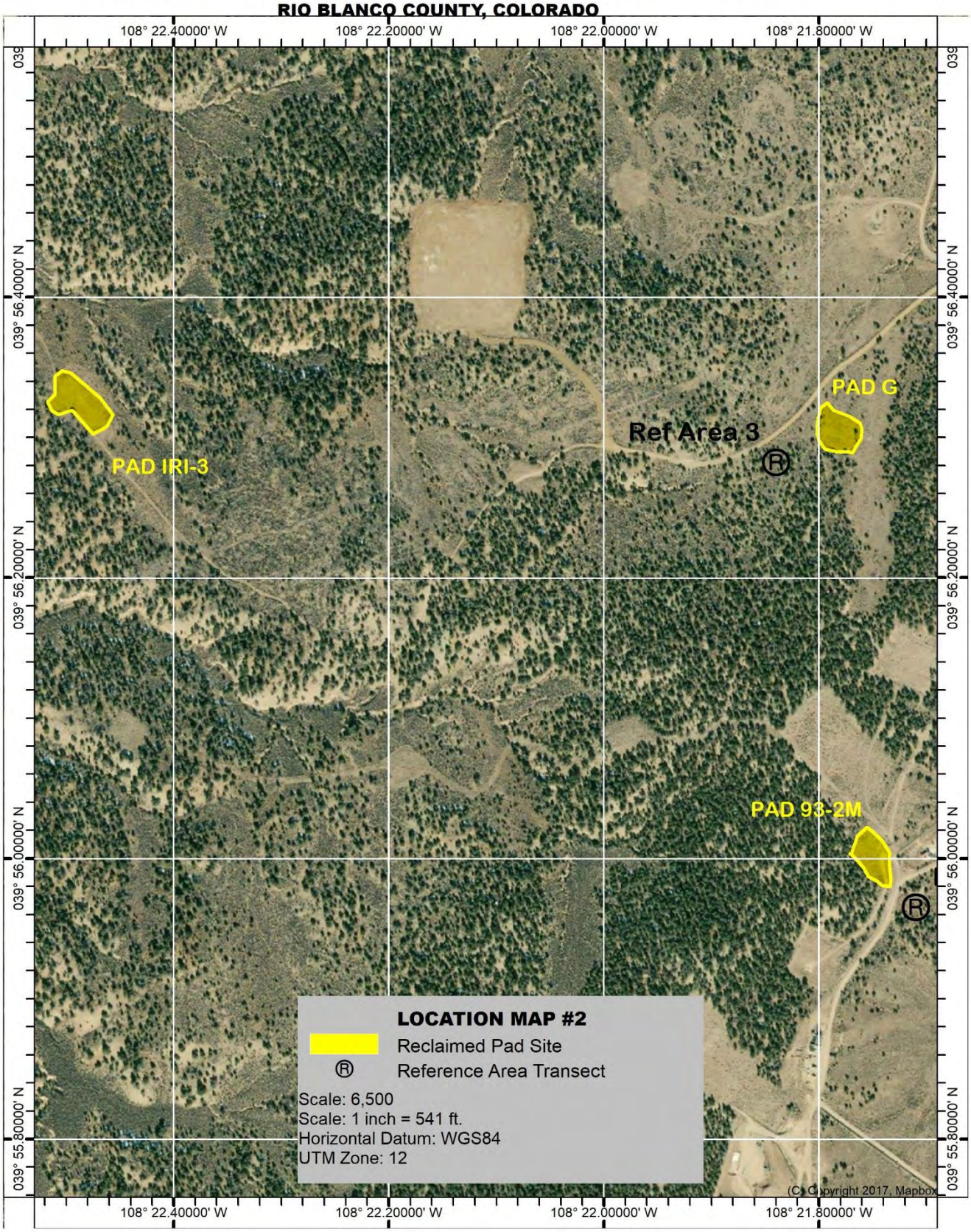
The plant community only meets the criteria for species diversity and bare ground. The criteria for desired foliar cover, desirable forb density and shrub density have not been met. This site does not meet all the criteria for successful reclamation of the disturbance at the site.

Location Maps

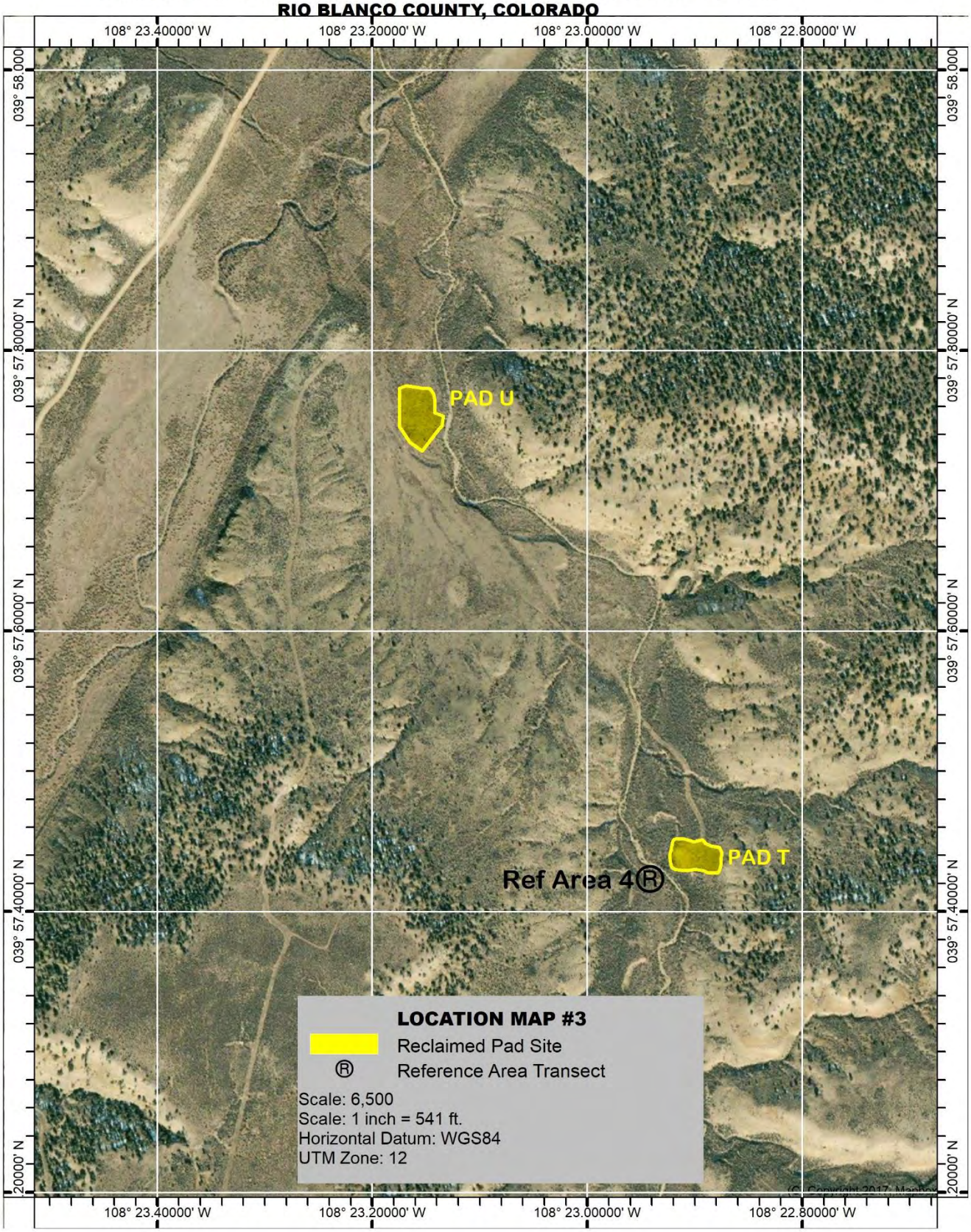
NATURAL SODA 2023 VEGETATION MONITORING OF RECLAIMED SITES
RIO BLANCO COUNTY, COLORADO



NATURAL SODA 2023 VEGETATION MONITORING OF RECLAIMED SITES
RIO BLANCO COUNTY, COLORADO



NATURAL SODA 2023 VEGETATION MONITORING OF RECLAIMED SITES
RIO BLANCO COUNTY, COLORADO



Appendix A – Vegetation Sampling Data Native Rangeland Reference Areas

Table A1 - Rolling Loam Native Rangeland Reference Areas						
Vegetation Cover, Species Composition, Species Density & Ground Cover						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	4.00	2.00	5.66	
ELELE	*Elymus elymoides ssp. elymoides*	bottlebrush squirreltail	0.50	0.00	0.63	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	8.50	2.00	13.21	
KOMA	*Koeleria macrantha*	prairie junegrass	8.00	2.00	13.21	
PASM	*Pascopyrum smithii*	western wheatgrass	18.50	1.00	24.53	
POSE	*Poa secunda*	Sandberg bluegrass	0.50	0.00	0.63	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	2.00	1.00	2.52	**Desirable Forb/Shrub Density (#/m²)**
		Perennial Grass Totals	**42.00**	**8.00**	**60.38**	
ANRO2	*Antennaria rosea*	rosey pussytoes	0.50	0.00	0.63	0.03
ARBI2	*Artemisia biennis*	biennial wormwood	0.00	0.00	0.00	0.03
ASCO12	*Astragalus convallarius*	lesser-rushy mlkvetch	1.50	0.00	3.14	0.33
CRFL6	*Cryptantha flavoculata*	roughseed cryptanth	0.00	0.00	0.00	0.15
EREA	*Erigeron eatonii*	Eaton's fleabane	0.00	0.00	0.00	0.50
HEBO	*Hedysarum boreale*	Utah sweetvetch	0.00	0.00	0.63	0.13
LEER	*Leucelene ericoides*	heath aster	0.00	0.00	0.00	0.05
LUAR3	*Lupinus argenteus*	silvery lupine	2.00	0.00	3.14	0.18
MAGR2	*Machaeranthera grindelioides*	rayless tansyaster	1.00	0.00	1.89	0.28
OPPO	*Opuntia polyacantha*	plains pricklypear cactus	0.00	0.00	0.00	0.08
PHHO	*Phlox hoodii*	Hood's phlox	1.00	0.00	1.26	1.05
PHLO	*Phlox longifolia*	longleaf phlox	0.00	0.00	0.00	0.03
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	1.00	0.00	1.89	0.85
		Desirable Forb Totals	**7.00**	**0.00**	**12.58**	**3.65**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	11.00	0.00	15.09	1.15
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	1.50	0.00	1.89	0.15
GUSA2	*Gutierrezia sarothrae*	broom snakeweed	1.00	0.00	1.26	0.30
JUOS	*Juniperus osteosperma*	Utah juniper	0.50	0.00	0.63	0.05
KRLA2	*Krascheninnikovia lanata*	winterfat	0.00	0.00	0.00	0.03
PUTR2	*Purshia tridentata*	antelope bittrebrush	0.00	0.00	0.00	0.03
		Shrub Totals	**14.00**	**0.00**	**18.87**	**1.70**
BRTE	*Bromus tectorum*	cheatgrass	4.00	0.00	6.29	
LEDE	*Lepidium densiflorum*	common pepperweed	1.00	0.00	1.26	
SATR12	*Salsola tragus*	Russian thistle	0.50	0.00	0.63	
		Totals for Invasive and Non-Native Species	**5.50**	**0.00**	**8.18**	
		Vegetation Totals	**68.50**	**8.00**	**100.00**	**5.35**

[1] Sum of data from 4 randomly placed transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface.

Soil Surface Cover Type (%)[4]	
Bare Ground	**23.0**
Biotic Crust	**0.0**
Herbaceous Litter	**48.0**
Woody Litter	**1.0**
Duff	**0.0**
Rock	**0.0**

Table A2 - Canopy Gap Intercept Data Rolling Loam Native Rangeland Reference Area										
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**		**Gaps 21-50 cm**		**Gaps 51-100 cm**		**Gaps 101-200 cm**		**Gaps >200 cm**	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Transect 1	881	277	488	193	393	384	0	0	0	0
Transect 2	1153	865	297	366	593	499	263	0	0	0
Transect 3	939	914	512	483	173	431	254	0	0	0
Transect 4	835	1234	465	276	265	678	105	280	0	0
Total Gaps (cm)	**3808**	**3290**	**1762**	**1318**	**1424**	**1992**	**622**	**280**	**0**	**0**
% Line in Gaps	**38.08**	**32.90**	**17.62**	**13.18**	**14.24**	**19.92**	**6.22**	**2.80**	**0.00**	**0.00**
Line length for each transect was 25 meters.										

Table A3 - Transect Coordinate Locations Native Rangeland Reference Areas (Datum: UTM Zone 12, WGS 84)						
Site	Azimuth from starting point (true N)	Transect Starting Point		Transect Ending Point		Length
		Northing (mN)	Easting (mE)	Northing (mN)	Easting (mE)	
Transect 1	309 º	4423129.528	726334.5835	4423144.65	726312.4928	25 meters
Transect 2	127 º	4423632.509	725412.1264	4423621.76	725435.624	25 meters
Transect 3	166 º	4424204.336	725211.5862	4424184.072	725221.422	25 meters
Transect 4	289 º	4426270.532	723610.85	4426277.177	723587.3982	25 meters

Transect Photos -- Native Rangeland Reference Areas

Figure A1 - Rolling Loam Rangeland Reference Area Transect #1

Figure A2 - Rolling Loam Rangeland Reference Area Transect #2

Figure A3 - Rolling Loam Rangeland Reference Area Transect #3

Figure A4 - Rolling Loam Rangeland Reference Area Transect #4

Appendix B – Vegetation Sampling Data Reclaimed Well Pad 93-2M

Table B1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Pad 93-2M

Plant Species Observed within Study Area			Line-Point Canopy Intercept Data [1]			Density Data [2]
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
AGCR	*Agropyron cristatum*	crested wheatgrass	2.0	0.0	3.06	
ELLAL	*Elymus lanceolatus ssp lanceolatus*	thickspike wheatgrass	1.3	0.7	2.04	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	13.3	3.3	21.43	
LECI4	*Leymus cinereus*	basin wildrye	2.0	0.0	3.06	
NAVI4	*Nassella viridula*	green needlegrass	1.3	0.0	2.04	
PASM	*Pascopyrum smithii*	western wheatgrass	5.3	0.0	8.16	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	18.7	2.7	30.61	
THIN6	*Thinopyrum intermedium*	pubescent wheatgrass	1.3	0.0	2.04	**Forb/Shrub Density (#/m^2)**
		Perennial Grass Totals	**45.3**	**6.7**	**72.45**	
LILE3	*Linum lewisii*	Lewis flax	0.0	0.0	0.00	0.07
MESA	*Medicago sativa*	alfalfa	2.0	0.0	3.06	0.23
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	0.7	0.0	1.02	0.20
		Desirable Forb Totals	**2.7**	**0.0**	**4.08**	**0.50**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	1.3	0.0	2.04	0.13
ATCA2[3]	*Atriplex canescens*	four-wing saltbush	0.0	0.0	0.00	0.00
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	4.7	0.0	7.14	0.20
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	1.3	0.0	2.04	0.33
		Shrub Totals	**7.3**	**0.0**	**11.22**	**0.67**
BRTE	*Bromus tectorum*	cheatgrass	4.7	0.0	9.18	
DESO2	*Descurainia sophia*	yellow mustard	1.3	0.0	2.04	
SATR12	*Salsola tragus*	Russian thistle	0.7	0.0	1.02	
		Totals for Invasive and Non-Native Species	**6.67**	**0.00**	**12.24**	
		Vegetation Totals	**62.0**	**6.7**	**100.0**	**1.17**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**23.3**
Biotic Crust	**0.0**
Herbaceous Litter	**56.0**
Woody Litter	**1.3**
Duff	**0.0**
Rock	**0.0**

Table B2 - Canopy Gap Intercept Data Reclaimed Pad 93-2M

Canopy Gaps > 20 centimeters	Total of Gaps > 20 cm		Gaps 21-50 cm		Gaps 51-100 cm		Gaps 101-200 cm		Gaps >200 cm	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Transect 1	1252	968	564	497	484	367	0	104	204	0
Transect 2	1341	858	123	156	420	600	376	102	422	0
Transect 3	730	699	576	545	154	154	0	0	0	0
Total Gaps (cm)	**3323**	**2525**	**1263**	**1198**	**1058**	**1121**	**376**	**206**	**626**	**0**
% Line in Gaps	**44.31**	**33.67**	**16.84**	**15.97**	**14.11**	**14.95**	**5.01**	**2.75**	**8.35**	**0.00**

Line length for each transect was 25 meters for site total length of 75 meters

Table B3 - Transect Coordinate Locations Reclaimed Pad 93-2M (Datum: UTM Zone 12, WGS 84)						
	Azimuth from starting point (true N)	Transect Starting Point		Transect Ending Point		
Site		Northing (mN)	Easting (mE)	Northing (mN)	Easting (mE)	Length
Transect 1	171 º	4423685.915	725373.3398	4423663.186	725382.4797	25 meters
Transect 2	261 º	4423688.38	725374.0367	4423691.455	725350.253	25 meters
Transect 3	329 º	4423692.974	725371.5915	4423717.406	725363.6842	25 meters

Transect Photos -- Reclaimed Pad 93-2M

Figure B1 Transect 1 Reclaimed Pad 93-2M

Figure B2 Transect 2 Reclaimed Pad 93-2M

Figure B3 Transect 3 Reclaimed Pad 93-2M

Appendix C – Vegetation Sampling Data Reclaimed Pad BG-8

Table C1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Pad BS-8						
Plant Species Observed within Study Area			Line-Point Canopy Intercept Data [1]			Density Data [2]
Species Symbol	Scientific Name	Common Name	% Foliar Cover	% Basal Cover	Species Composition	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	3.3	1.3	4.50	
AGCR	*Agropyron cristatum*	crested wheatgrass	0.7	0.7	0.90	
ELLAL	*Elymus lanceolatus ssp lanceolatus*	thickspike wheatgrass	4.0	0.7	5.41	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	20.8	4.7	28.83	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	0.7	0.0	0.90	
LECI4	*Leymus cinereus*	basin wildrye	0.0	0.0	0.00	
PASM	*Pascopyrum smithii*	western wheatgrass	3.3	0.0	4.50	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	9.3	2.7	12.61	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	4.0	0.0	5.42	
THIN6	*Thinopyrum intermedium*	intermedate wheatgrass	0.7	0.0	0.90	**Forb/Shrub Density (#/m²)**
		Perennial Grass Totals	**46.7**	**10.0**	**63.97**	
ASCI4[3]	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.00	0.00
HEBO[3]	*Hedysarum boreale*	Utah sweetvetch	0.0	0.0	0.00	0.00
LILE3[3]	*Linum lewisii*	Lewis flax	0.0	0.0	0.00	0.00
MACA2	*Machaeranthera canescens*	hoary tansyaster	0.0	0.0	0.90	0.07
MESA	*Medicago sativa*	alfalfa	0.0	0.0	0.00	0.03
TRDU	*Tragopogon dubius*	western salsify	0.7	0.0	0.90	0.00
		Desirable Forb Totals	**0.7**	**0.0**	**1.80**	**0.10**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	4.0	0.0	5.41	0.13
ATCA2	*Atriplex canescens*	four-wing saltbush	0.0	0.0	0.00	0.03
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	1.3	0.0	1.80	0.10
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	0.7	0.0	0.90	0.20
KRLA2[3]	*Krascheninnikovia lanata*	winterfat	0.0	0.0	0.00	0.00
		Shrub Totals	**6.0**	**0.0**	**8.11**	**0.46**
BRTE	*Bromus tectorum*	cheatgrass	8.0	0.0	12.61	
LEDE	*Lepidium densiflorum*	common pepperweed	0.7	0.0	1.80	
SATR12	*Salsola tragus*	Russian thistle	8.0	0.0	11.71	
		Totals for Invasive and Non-Native Species	**16.7**	**0.0**	**26.13**	
		Vegetation Totals	**70.0**	**10.0**	**100.0**	**0.56**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**18.0**
Biotic Crust	**0.0**
Herbaceous Litter	**55.3**
Woody Litter	**1.3**
Duff	**0.0**
Rock	**1.3**

Table C2 - Canopy Gap Intercept Data Reclaimed Pad BS-8										
Canopy Gaps > 20 centimeters	Total of Gaps > 20 cm		Gaps 21-50 cm		Gaps 51-100 cm		Gaps 101-200 cm		Gaps >200 cm	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Transect 1	836	762	258	405	0	357	122	0	456	0
Transect 2	1555	896	110	147	334	287	628	0	483	462
Transect 3	1080	830	385	396	128	257	567	177	0	0
Total Gaps (cm)	**3471**	**2488**	**753**	**948**	**462**	**901**	**1317**	**177**	**939**	**462**
% Line in Gaps	**46.28**	**33.17**	**10.04**	**12.64**	**6.16**	**12.01**	**17.56**	**2.36**	**12.52**	**6.16**

Line length for each transect was 25 meters for site total length of 75 meters

Table C3 - Transect Coordinate Locations Reclaimed Pad BS-8 (Datum: UTM Zone 12, WGS 84)						
	Azimuth from starting point (true N)	Transect Starting Point		Transect Ending Point		
Site		Northing (mN)	Easting (mE)	Northing (mN)	Easting (mE)	Length
Transect 1	132 º	4423091.376	726318.1803	4423079.857	726338.1113	25 meters
Transect 2	229 º	4423091.744	726315.6032	4423074.221	726297.9886	25 meters
Transect 3	290 º	4423100.98	726316.0988	4423105.048	726292.1976	25 meters

Transect Photos – Reclaimed Pad BG-8

Figure C1 Transect 1 Reclaimed Pad BG-8

Figure C2 Transect 2 Reclaimed Pad BG-8

Figure C3 Transect 3 Reclaimed Pad BG-8

Appendix D – Vegetation Sampling Data Reclaimed Corehole Pad G

Table D1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Pad G						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	3.3	0.7	5.74	
ELLAL	*Elymus lanceolatus ssp lanceolatus*	thickspike wheatgrass	4.1	0.7	4.92	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	15.3	2.0	21.31	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	11.3	3.3	16.38	
LECI4	*Leymus cinereus*	basin wildrye	1.3	0.0	1.64	
NAVI4	*Nassella viridula*	green needlegrass	3.3	0.7	4.92	
PASM	*Pascopyrum smithii*	western wheatgrass	4.7	0.0	7.38	
KOMA	*Koeleria macrantha*	prairie junegrass	2.0	0.0	2.46	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	2.0	0.7	2.46	**Desirable Forb/Shrub Density (#/m²)**
		Perennial Grass Totals	**47.3**	**8.1**	**67.21**	
ASCI4	*Astragalus cicer*	cicer milkvetch	0.0	0.0	0.00	0.07
ASCO12	*Astragalus convallarius*	lesser-rushy mlkvetch	0.7	0.0	0.82	0.07
CRAC	*Crepis acuminata*	longleaf hawksbeard	0.0	0.0	0.00	0.10
CRFL6	*Cryptantha flavoculata*	roughseed cryptanth	0.0	0.0	0.00	0.13
EREA[3]	*Erigeron eatonii*	Eaton fleabane	0.0	0.0	0.00	0.00
HEBO[3]	*Hedysarum boreale*	Utah sweetvetch	0.0	0.0	0.00	0.00
LEER	*Leucelene ericoides*	heath aster	0.0	0.0	0.00	0.07
LILE3	*Linum lewisii*	Lewis flax	0.0	0.0	0.00	0.30
MACA2	*Machaeranthera canescens*	hoary tansyaster	0.0	0.0	0.00	0.13
MAGR2	*Machaeranthera grindelioides*	rayless tansyaster	0.7	0.0	0.82	0.30
MESA	*Medicago sativa*	alfalfa	3.3	0.0	5.73	0.77
OPPO	*Opuntia polyacantha*	plains pricklypear cactus	0.0	0.0	0.00	0.03
PEST2[3]	*Penstemon strictus*	Rocky Mountain penstemon	0.0	0.0	0.00	1.00
PHHO[3]	*Phlox hoodii*	Hood's phlox	0.0	0.0	0.00	0.00
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	1.3	0.7	3.28	0.53
		Desirable Forb Totals	**6.0**	**0.7**	**10.65**	**3.50**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.7	0.7	0.82	0.10
ATCA2	*Atriplex canescens*	four-wing saltbush	2.0	0.0	2.46	0.10
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	1.3	0.0	2.46	0.17
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	0.0	0.0	0.00	0.13
KRLA2	*Krascheninnikovia lanata*	winterfat	2.0	0.0	2.46	0.13
PUTR2	*Purshia tridentata*	antelope bittrebrush	0.0	0.0	0.00	0.04
		Shrub Totals	**6.0**	**0.7**	**8.20**	**0.67**
BRTE	*Bromus tectorum*	cheatgrass	3.3	0.0	7.38	
LEDE	*Lepidium densiflorum*	common pepperweed	0.7	0.0	0.82	
SATR12	*Salsola tragus*	Russian thistle	4.7	0.0	5.74	
		Totals for Invasive and Non-Native Species	**8.7**	**0.0**	**13.94**	
		Vegetation Totals	**68.0**	**9.4**	**100.0**	**4.17**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.

[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.

[3] Plant species not encountered in sampling data but were present within the study area.

[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [3]	
Bare Ground	**16.7**
Biotic Crust	**0.0**
Herbaceous Litter	**58.7**
Woody Litter	**4.7**
Duff	**0.0**
Rock	**0.0**

Table D2 - Canopy Gap Intercept Data Reclaimed Exploration Pad G										
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**		**Gaps 21-50 cm**		**Gaps 51-100 cm**		**Gaps 101-200 cm**		**Gaps >200 cm**	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Transect 1	873	894	378	490	495	260	0	144	0	0
Transect 2	1482	1141	137	394	223	615	639	132	483	0
Transect 3	1216	543	193	376	672	167	351	0	0	0
Total Gaps (cm)	**3571**	**2578**	**708**	**1260**	**1390**	**1042**	**990**	**276**	**483**	**0**
% Line in Gaps	**47.61**	**34.37**	**9.44**	**16.80**	**18.53**	**13.89**	**13.20**	**3.68**	**6.44**	**0.00**
Line length for each transect was 25 meters for site total length of 75 meters										

Table D3 - Transect Coordinate Locations Reclaimed Exploration Pad G (Datum: UTM Zone 12, WGS 84)						
Site	**Azimuth from starting point (true N)**	**Transect Starting Point**		**Transect Ending Point**		**Length**
		Northing (mN)	**Easting (mE)**	**Northing (mN)**	**Easting (mE)**	
Reclaimed Exploration Pad G						
Transect 1	009 º	4424260.363	725295.2862	4424283.552	725294.173	25 meters
Transect 2	123 º	4424250.262	725295.5849	4424242.103	725316.5237	25 meters
Transect 3	248 º	4424254.609	725292.2919	4424244.496	725269.6696	25 meters

Transect Photos -- Reclaimed Corehole Pad G

Figure D1 Transect 1 Reclaimed Corehole Pad G

Figure D2 Transect 2 Reclaimed Corehole Pad G

Figure D3 Transect 3 Reclaimed Corehole Pad G

Appendix E – Vegetation Sampling Data Reclaimed Corehole Pads IRI-3, MW1, PW1, PW2

Table E1 - Vegetation Cover, Species Composition, Species Density & Ground Cover
Reclaimed Exploration Corehole Pad IRI-3, MW-1, PW-1, and PW-2

Plant Species Observed within Study Area			Line-Point Canopy Intercept Data [1]			Density Data [2]
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	1.3	1.3	2.30	
AGCR	*Agropyron cristatum*	crested wheatgrass	7.3	0.7	12.64	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	13.3	2.7	24.14	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	4.7	1.3	9.20	
LECI4	*Leymus cinereus*	basin wildrye	0.7	0.0	1.14	
PASM	*Pascopyrum smithii*	western wheatgrass	6.0	0.0	11.49	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	16.7	4.0	28.74	
PSSPI[3]	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	0.0	0.0	0.00	**Desirable Forb/Shrub Density (#/m²)**
THIN6[3]	*Thinopyrum intermedium*	pubescent wheatgrass	0.0	0.0	0.00	
		Perennial Grass Totals	**50.0**	**10.0**	**89.65**	
EREA	*Erigeron eatonii*	Eaton's fleabane	0.0	0.0	0.00	0.03
LILE3	*Linum lewisii*	Lewis flax	0.0	0.0	0.00	0.10
MACA2[3]	*Machaeranthera canescens*	hoary tansyaster	0.0	0.0	0.00	0.00
MAGR2[3]	*Machaeranthera grindelioides*	rayless tansyaster	0.0	0.0	0.00	0.00
MESA	*Medicago sativa*	alfalfa	0.0	0.0	0.00	0.10
PHHO[3]	*Phlox hoodii*	Hood's phlox	0.0	0.0	0.00	0.00
		Desirable Forb Totals	**0.0**	**0.0**	**0.00**	**0.23**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	0.7	0.0	1.15	0.20
ATCA2	*Atriplex canescens*	four-wing saltbush	1.3	0.0	2.30	0.37
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	1.3	0.0	2.30	0.07
GUSA2[3]	*Gutierrezia sarothrae*	broom Snakeweed	0.0	0.0	0.00	0.00
		Shrub Totals	**3.3**	**0.0**	**5.75**	**0.64**
BRTE	*Bromus tectorum*	cheatgrass	2.0	0.0	3.45	
LEPE2	*Lepidium perfoliatum*	clasping pepperweed	0.7	0.0	1.15	
		Totals for Invasive and Non-Native Species	**2.7**	**0.0**	**4.60**	
		Vegetation Totals	**56.0**	**10.0**	**100.0**	**0.87**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]

Bare Ground	**24.0**
Biotic Crust	**0.0**
Herbaceous Litter	**58.0**
Woody Litter	**0.7**
Duff	**0.0**
Rock	**0.7**

Table E2 - Canopy Gap Intercept Data
Reclaimed Exploration Corehole Pad IRI-3, MW-1, PW-1 and PW-2

Canopy Gaps > 20 centimeters	Total of Gaps > 20 cm		Gaps 21-50 cm		Gaps 51-100 cm		Gaps 101-200 cm		Gaps >200 cm	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Transect 1	732	1079	322	479	173	343	237	257	0	0
Transect 2	1519	1330	290	474	506	707	246	149	477	0
Transect 3	1061	499	518	291	367	55	176	153	0	0
Total Gaps (cm)	**3312**	**2908**	**1130**	**1244**	**1046**	**1105**	**659**	**559**	**477**	**0**
% Line in Gaps	**44.16**	**38.77**	**15.07**	**16.59**	**13.95**	**14.73**	**8.79**	**7.45**	**6.36**	**0.00**

Line length for each transect was 25 meters for site total length of 75 meters

Table E3 - Transect Coordinate Locations Reclaimed Exploration Pad IRI-3, MW-1, PW-1 and PW-2 (Datum: UTM Zone 12, WGS 84)						
Site	Azimuth from starting point (true N)	Transect Starting Point		Transect Ending Point		Length
		Northing (mN)	Easting (mE)	Northing (mN)	Easting (mE)	
Transect 1	102 º	4424251.338	724300.1099	4424252.065	724324.8055	25 meters
Transect 2	002 º	4424258.789	724300.3183	4424283.395	724298.3111	25 meters
Transect 3	274 º	4424256.981	724291.7334	4424257.992	724265.7037	25 meters

Transect Photos -- Reclaimed Corehole Pads IRI3, MW1, PW1, PW2

Figure E1 Transect 1 Reclaimed Pads IRI3, MW1, PW1, PW2

Figure E2 Transect 2 Reclaimed Pads IRI3, MW1, PW1, PW2

Figure E3 Transect 3 Reclaimed Pads IRI3, MW1, PW1, PW2

Appendix F – Vegetation Sampling Data Reclaimed Corehole Pad T

Table F1 - Vegetation Cover, Species Composition, Species Density & Ground Cover
Reclaimed Exploration Corehole Pad T

Plant Species Observed within Study Area			Line-Point Canopy Intercept Data [1]			Density Data [2]
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	0.7	0.0	2.74	
ELLAL	*Elymus lanceolatus ssp lanceolatus*	thickspike wheatgrass	0.0	0.0	0.91	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	3.3	1.3	5.45	
HECO26[3]	*Hesperostipa comata*	needle & thread needlegrass	2.7	0.0	4.55	
LECI4	*Leymus cinereus*	basin wildrye	2.0	0.7	2.73	
NAVI4	*Nassella viridula*	green needlegrass	2.0	0.0	2.73	
PASM	*Pascopyrum smithii*	western wheatgrass	0.7	0.0	0.91	
PSJU3	*Psathyrostachys juncea*	Russian wildrye	0.7	0.0	0.91	
PSSPI	*Pseudoroegneria spicata ssp. inermis*	beardless bluebunch wheatgrass	0.7	0.0	0.91	**Desirable Forb/Shrub Density (#/m²)**
		Perennial Grass Totals	**12.8**	**2.0**	**21.84**	
ARFR4[3]	*Artemisia frigida*	fringed sage	0.0	0.0	0.00	0.00
ARLU	*Artemisia ludoviciana*	prairie sage	2.7	0.0	3.66	0.30
LILE3	*Linum lewisii*	Lewis flax	0.0	0.0	0.00	0.03
MACA2	*Machaeranthera canescens*	hoary tansyaster	1.3	0.0	2.73	0.47
MESA	*Medicago sativa*	alfalfa	2.0	0.7	2.73	0.67
SPCO[3]	*Sphaeralcea coccinea*	scarlet globemallow	0.0	0.0	0.00	0.00
		Desirable Forb Totals	**6.0**	**0.7**	**9.12**	**1.47**
ARTRW	*Artemisia tridentata var. wyomingensis*	Wyoming big sagebrush	3.3	0.0	4.5	0.67
ATCA2[3]	*Atriplex canescens*	four-wing saltbush	0.0	0.0	0.0	0.00
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	6.7	0.7	9.11	0.47
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	2.0	0.0	2.7	0.10
KRLA2	*Krascheninnikovia lanata*	winterfat	0.7	0.0	0.91	0.10
		Shrub Totals	**12.7**	**0.7**	**17.22**	**1.34**
ALDE	*Alyssum desertorum*	desert madwort	2.7	0.0	6.36	
BRTE	*Bromus tectorum*	cheatgrass	20.0	0.0	33.64	
SATR12	*Salsola tragus*	Russian thistle	6.7	0.0	11.82	
		Totals for Invasive and Non-Native Species	**29.4**	**0.0**	**51.82**	
		Vegetation Totals	**60.9**	**3.4**	**100.0**	**2.81**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Plant species not encountered in sampling data but were present within the study area.
[4] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [4]	
Bare Ground	**28.7**
Biotic Crust	**0.0**
Herbaceous Litter	**45.3**
Woody Litter	**4.7**
Duff	**0.0**
Rock	**0.0**

Table F2 - Canopy Gap Intercept Data
Reclaimed Exploration Corehole Pad T

Canopy Gaps > 20 centimeters	Total of Gaps > 20 cm		Gaps 21-50 cm		Gaps 51-100 cm		Gaps 101-200 cm		Gaps >200 cm	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Transect 1	2298	2056	0	21	386	153	509	707	1403	1175
Transect 2	1809	1459	228	286	447	607	1134	255	0	311
Transect 3	1775	1822	177	186	390	654	972	732	236	250
Total Gaps (cm)	**5882**	**5337**	**405**	**493**	**1223**	**1414**	**2615**	**1694**	**1639**	**1736**
% Line in Gaps	**78.43**	**71.16**	**5.40**	**6.57**	**16.31**	**18.85**	**34.87**	**22.59**	**21.85**	**23.15**

Line length for each transect was 25 meters for site total length of 75 meters

Table F3 - Transect Coordinate Locations Reclaimed Exploration Pad T (Datum: UTM Zone 12, WGS 84)						
	Azimuth from starting point (true N)	Transect Starting Point		Transect Ending Point		
Site		Northing (mN)	Easting (mE)	Northing (mN)	Easting (mE)	Length
Transect 1	135 º	4426312.671	723664.847	4426298.139	723684.5119	25 meters
Transect 2	191 º	4426310.893	723661.0517	4426290.09	723656.3615	25 meters
Transect 3	230 º	4426310.153	723654.7463	4426299.332	723638.1346	25 meters

Transect Photos -- Reclaimed Corehole Pad T

Figure F1 Transect 1 Reclaimed Corehole Pad T

Figure F2 Transect 2 Reclaimed Corehole Pad T

Figure F3 Transect 3 Reclaimed Corehole Pad T

Appendix G – Vegetation Sampling Data Reclaimed Corehole Pad U

Table G1 - Vegetation Cover, Species Composition, Species Density & Ground Cover Reclaimed Exploration Corehole Pad U						
Plant Species Observed within Study Area			**Line-Point Canopy Intercept Data [1]**			**Density Data [2]**
Species Symbol	**Scientific Name**	**Common Name**	**% Foliar Cover**	**% Basal Cover**	**Species Composition**	
ACHY	*Achnatherum hymenoides*	Indian ricegrass	2.0	1.3	3.00	
ELTR7	*Elymus trachycaulus*	slender wheatgrass	2.7	0.7	5.00	
HECO26	*Hesperostipa comata*	needle & thread needlegrass	1.3	0.7	2.00	
PASM	*Pascopyrum smithii*	western wheatgrass	8.7	0.0	15.00	**Desirable Forb/Shrub Density (#/m²)**
PSJU3	*Psathyrostachys juncea*	Russian wildrye	0.7	0.0	1.00	
		Perennial Grass Totals	**15.4**	**2.7**	**26.00**	
LEMO2[3]	*Lepidium montanum*	mountain pepperwed	0.0	0.0	0.00	0.00
MESA	*Medicago sativa*	alfalfa	1.3	1.3	3.00	0.33
SPCO	*Sphaeralcea coccinea*	scarlet globemallow	0.0	0.0	0.00	0.04
		Desirable Forb Totals	**1.3**	**1.3**	**3.00**	**0.37**
ARTRT	*Artemisia tridentata var. tridentata*	basin big sagebrush	1.3	0.0	2.00	0.04
ATCA2	*Atriplex canescens*	four-wing saltbush	0.0	0.0	0.0	0.10
CHVI8	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	8.0	0.7	12.00	0.30
GUSA2	*Gutierrezia sarothrae*	broom Snakeweed	4.7	0.0	8.00	0.40
PUTR2[3]	*Purshia tridentata*	antelope bittrebrush	0.0	0.0	0.00	0.00
SAVE4	*Sarcobatus vermiculatus*	greasewood	0.7	0.0	1.00	0.04
		Shrub Totals	**14.7**	**0.7**	**23.00**	**0.88**
ALDE	*Alyssum desertorum*	desert madwort	2.0	0.0	4.00	
BRTE	*Bromus tectorum*	cheatgrass	22.0	0.0	34.00	
SATR12	*Salsola tragus*	Russian thistle	4.0	0.0	10.00	
		Totals for Invasive and Non-Native Species	**28.0**	**0.0**	**48.0**	
		Vegetation Totals	**59.4**	**4.7**	**100.0**	**1.25**

[1] Sum of data from 3 randomly placed 25 meter transects with 50 sample points collected from each transect. Foliar cover based upon 1st plant species encountered in the canopy at each sample point. Species composition based upon total of all plant species encountered at each sample point.
[2] Sum of density data collected from 10 one-square meter quadrants along each transect. Only desirable forb and shrub densities were recorded based upon reclamation criteria.
[3] Percentages are not cumulative with vegetation totals, rather a measure by layer of ground cover from the top layer thru the lower layers to the soil surface. Values for bare ground have no vegetative, litter or rock cover above the soil surface.

Percent Ground Cover by Cover Type [3]	
Bare Ground	**26.7**
Biotic Crust	**0.0**
Herbaceous Litter	**54.0**
Woody Litter	**4.0**
Duff	**0.0**
Rock	**0.0**

Table G2 - Canopy Gap Intercept Data Reclaimed Exploration Corehole Pad U										
Canopy Gaps > 20 centimeters	**Total of Gaps > 20 cm**		**Gaps 21-50 cm**		**Gaps 51-100 cm**		**Gaps 101-200 cm**		**Gaps >200 cm**	
	2022	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**	**2022**	**2023**
Transect 1	1768	1951	79	41	853	405	244	1120	592	385
Transect 2	2370	1880	46	82	78	480	492	594	1754	724
Transect 3	1909	1772	41	206	220	394	269	912	1379	260
Total Gaps (cm)	**6047**	**5603**	**166**	**329**	**1151**	**1279**	**1005**	**2626**	**3725**	**1369**
% Line in Gaps	**80.63**	**74.71**	**2.21**	**4.39**	**15.35**	**17.05**	**13.40**	**35.01**	**49.67**	**18.25**
Line length for each transect was 25 meters for site total length of 75 meters										

Table G3 - Transect Coordinate Locations Reclaimed Exploration Pad U (Datum: UTM Zone 12, WGS 84)						
Site	Azimuth from starting point (true N)	Transect Starting Point		Transect Ending Point		Length
		Northing (mN)	Easting (mE)	Northing (mN)	Easting (mE)	
Transect 1	358 º	4426860.967	723259.3946	4426887.815	723254.2471	25 meters
Transect 2	052 º	4426860.634	723259.4043	4426874.983	723278.904	25 meters
Transect 3	125 º	4426856.595	723258.0694	4426847.951	723281.5776	25 meters

Transect Photos -- Reclaimed Corehole Pad U

Figure G1 Transect 1 Reclaimed Corehole Pad U

Figure G2 Transect 2 Reclaimed Corehole Pad U

Figure G3 Transect 3 Reclaimed Corehole Pad U