



**To:** Eric Scott, Environmental Protection Specialist  
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**Subject:** Technical Revision 2, Nix Sand & Gravel Mine (M-2001-046), Response to Adequacy Review 2

**Date:** April 27, 2023

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This letter is the Operator's response to an April 6, 2023 letter from the Division, styled as Adequacy Review 2 to Technical Revision 2 ("TR2"), M-2001-046 (Nix Sand and Gravel Mine). Included within are the following responsive documents, specific answers, and commitments:

1. A Sampling and Analysis Plan ("SAP") consistent with industry standards is included. The SAP includes previously submitted site characterization information (water level data, nearby active sites, well locations, groundwater contour map, etc.). The SAP also includes detailed information on water quality monitoring (see SAP Section 3).
2. The provided SAP identifies "baseline" monitoring points for the initial five quarters of baseline water quality data collection, as well as "Points of Compliance" ("POC") and background monitoring locations for follow-up annual water quality monitoring. See, for example, SAP Figure 2 and SAP Section 3.2.1. SAP Table 2 includes a brief discussion as to why the locations have been chosen. The Operator notes that it has already installed an additional water quality POC well in the northwest corner of the site and will begin sampling there this June.
3. SAP Section 4.2 includes reporting criteria and "trigger values" for potential water level deviation observed during monthly water level monitoring that may initiate additional investigation.
4. After the five quarters of baseline data are collected—the first being those samples from June, 2021—Brannan agrees to submit a Baseline Data Summary Report as a Technical Revision (see SAP Section 3.2.2.1). This Report will include all water quality and water level data collected to date, identify any exceedances in Table Value Standards, and provide a rationale for observed exceedances, if possible.

The four points above further show the Operator's agreement to work with the Division to protect water quality. What it has asked for in the past, and still requests, is citation to the regulatory authority that requires such extensive, expensive, and time-consuming testing despite no evidence of Operator-caused water quality degradation.

With this letter and the enclosed technical documentation, the Operator urges the Division to accept TR2 as adequate.

Discussions with the Division have been productive and collaborative. Noting that comity, the Operator also requests the Division to acknowledge that longer term sampling to verify water quality conditions need not delay mining operations from commencing at Nix on May 2, 2023.

**Enclosed:**      Sampling and Analysis Plan

# SAMPLING AND ANALYSIS PLAN

Nix Sand and Gravel Mine

April 2023



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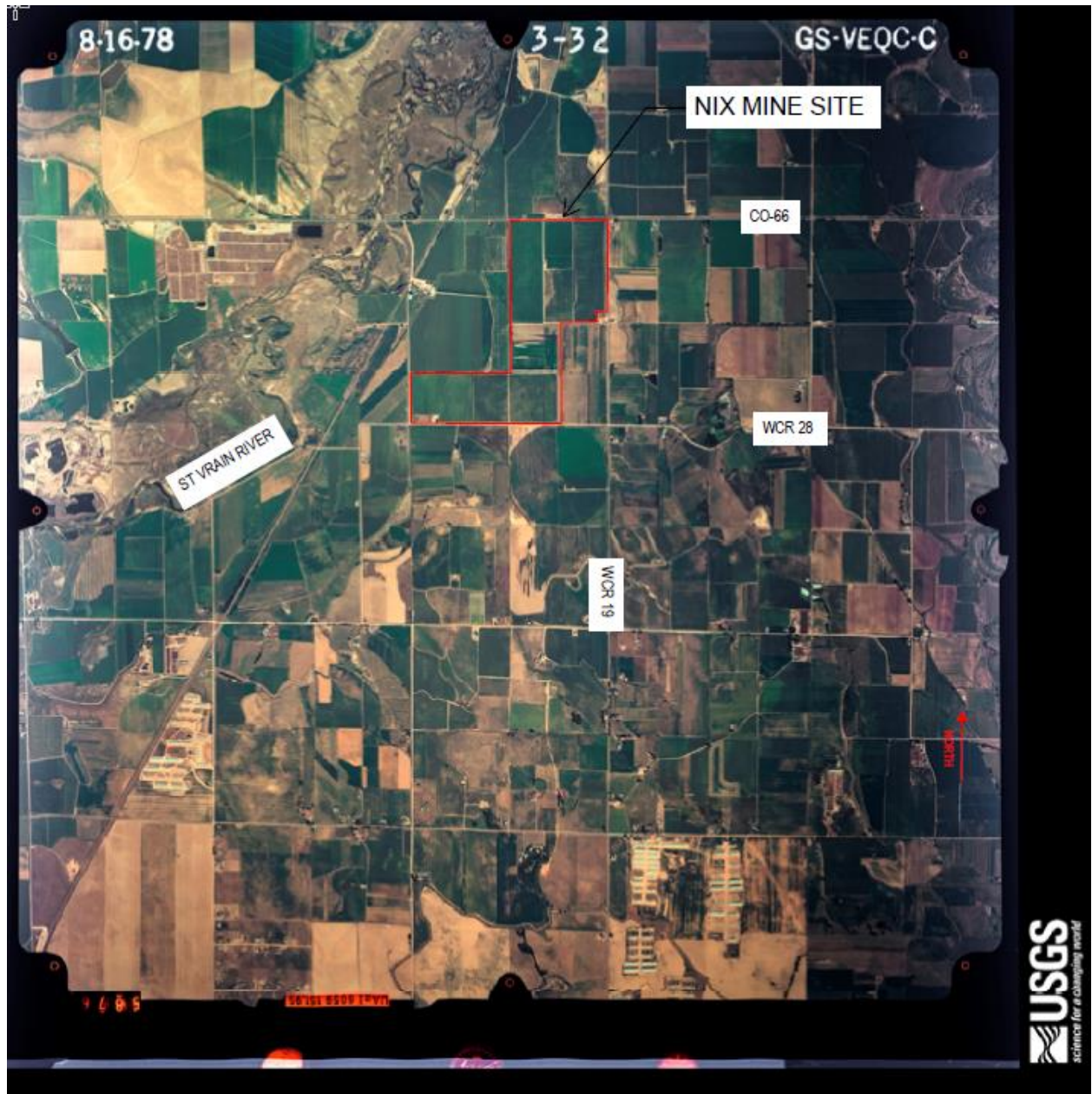
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## 1. BACKGROUND

Ready Mixed Concrete Company, LLC (RMCC, or Operator) plans to operate the Nix Sand and Gravel Mine (Nix) under the authority of the Colorado Division of Reclamation, Mining and Safety (DRMS) Permit M2001-046. Nix is in Weld County, approximately four miles west of Platteville, Colorado. See general vicinity map in **Figure 1**, below.

**Figure 1: Nix Mine Site and Vicinity**



## 2. BASELINE GROUNDWATER DATA

RMCC has gathered data from 13 monitoring wells located around the property. This data shows the baseline groundwater condition within the alluvial aquifer of the St. Vrain River. The locations of the sampled and measured wells can be found in **Figure 2**, below. This figure also provides information on the groundwater flow and shows the extensive mining to the south and west of Nix.

Five monitoring wells are on the southern boundary of the mining area, four are located on the interior of the site within a future slurry-walled area and may be removed when leak testing is complete, and four are in the northern section of the property. Of the latter, two are downgradient including the new Mon-9 drilled at DRMS's request in the northwest corner of the site. Wells Nix-Owens-Mon 1, Nix-Owens-Mon 2, and Nix-Owens-Mon 4A are now dry (likely due to adjacent dewatering); Well Nix-Varra-Mon 3 is only 1" in diameter and is not able to be sampled using standard techniques.

### 2.1 Baseline Groundwater Quality Data

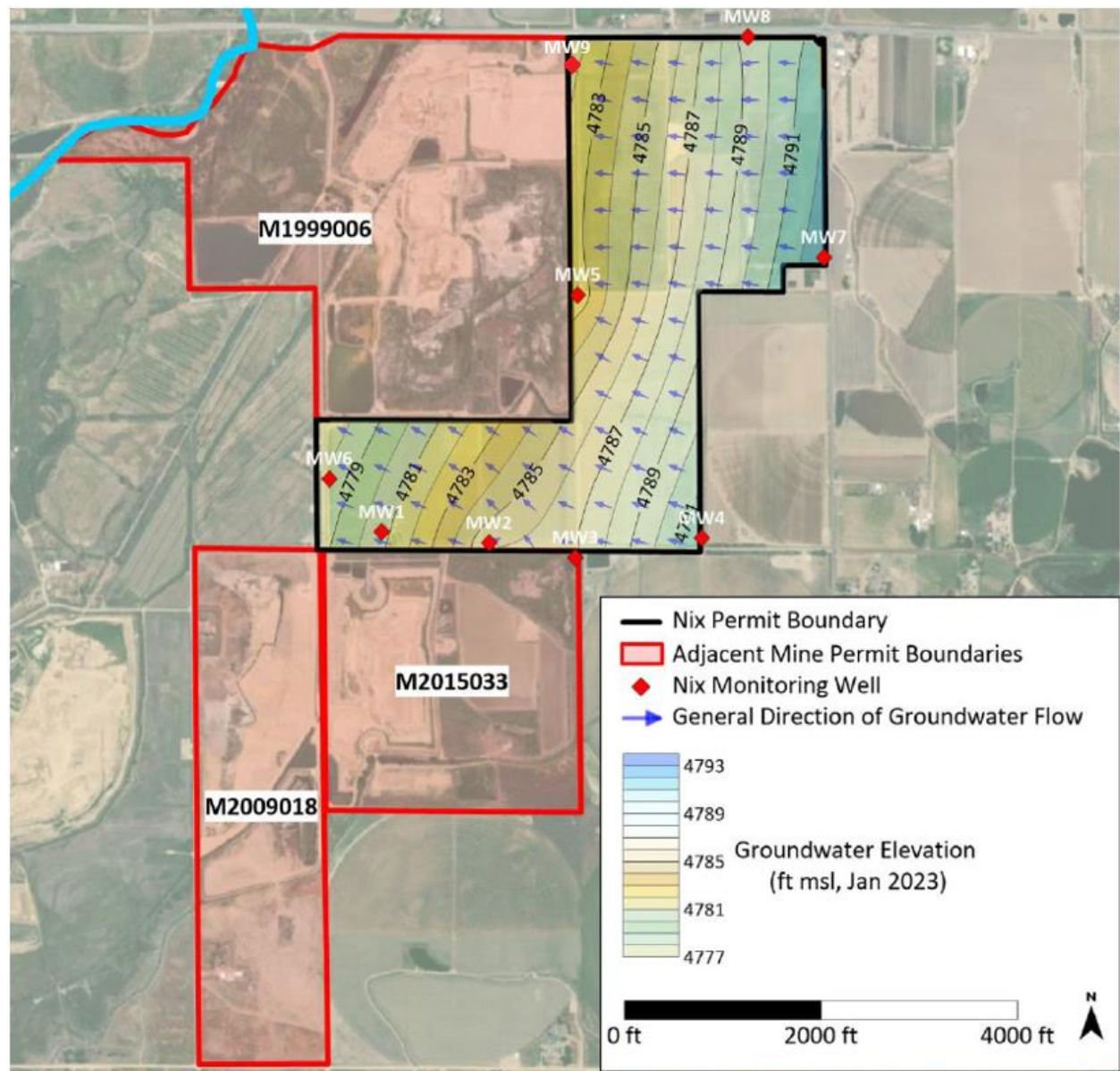
RMCC's sampling and monitoring program is conducted to thoroughly establish the baseline water quality and quantity for the site, and to allow for long-term water quality and water level monitoring. The purpose of the monitoring is to determine if gravel pit operations have impacted the alluvial aquifer. **Table 1** shows a summary of the initial well sample results from June 2021.

**Table 1: Baseline Groundwater Quality Data<sup>1</sup>**

	Compliance Standard	Nix-Owens Mon 4 (ug/L)	Nix-RMCC Mon 7 (ug/L)	Nix-RMCC Mon 6 (ug/L)	Nix-RMCC Mon 8 (ug/L)	Nix-Owens Mon 5A (ug/L)	Method Used	Detection Limit(ug/L)	Notes
Aluminum (Al)	5000 ug/L	309	220	1150	3460	3930	EPA 200.8	50	
Antimony (Sb)	6 ug/L	0.0805	ND	0.831	0.173	0.419	EPA 200.8	0.05	
Arsenic (As)	10 ug/L	ND	ND	0.692	0.967	0.857	EPA 200.8	0.6	
Asbestos	7.0x10 <sup>4</sup> fibers/L						TBD	TBD	Analyte not reported, RMCC to sample prior to May annual Report
Barium (Ba)	2000 ug/L	54.7	43.7	36.8	93.5	74.1	EPA 200.8	1	
Beryllium (Be)	4 ug/L	ND	ND	ND	0.106	ND	EPA 200.8	0.1	
Boron (B)	750 ug/L	204	243	201	212	245	EPA 200.8	10	
Cadmium (Cd)	5 ug/L	ND	ND	ND	ND	0.0512	EPA 200.8	0.05	
Chlorophenol	0.2 ug/L	ND	ND	ND	ND	ND	EPA 8270D	10	
Chloride (Cl)	250000 ug/L	145000	157000	89600	136000	94000	EPA 300.0	6000	
Chromium (Cr)	100 ug/L						EPA 200.8	TBD	Recovering 2021 data from lab, will sample prior to May Report
Cobalt (Co)	50 ug/L	ND	ND	ND	ND	ND	EPA 200.8	1	
Copper (Cu)	200 ug/L	1.41	ND	4.43	1.54	4.02	EPA 200.8	1	
Cyanide (Free)(CN)	200 ug/L	ND	ND	ND	ND	ND	EPA 335.4	50	
Fluoride (F)	2000 ug/L	631	697	1210	1360	1750	EPA 300.0	40	
Iron (Fe)	300 ug/L	214	159	771	2060	1640	EPA 200.8	10	Above domestic water supply standards, below agricultural
Lead (Pb)	50 ug/L	ND	ND	1.55	1.83	1.37	EPA 200.8	0.5	
Lithium (Li)	2500 ug/L	20.9	28.5	14.9	23.2	43.6	EPA 200.7	5	
Nickel (Ni)	100 ug/L	1.69	2.57	1.2	5.56	3.13	EPA 200.8	1	
Nitrate (NO3)	10000 ug/L	11500	3630	3720	12900	13900	EPA 300.0	0.05	Above domestic water supply standards
Nitrite (NO2)	1000 ug/L	6820	7450	3830	6680	4570	EPA 300.0	0.06	Above domestic water supply standards, below agricultural
Nitrite & Nitrate (NO2+NO3)	10000 ug/L	18320	11080	7550	19580	18470	EPA 300.0	NA	Above domestic water supply standards/ below AG
Manganese (Mn)	50 ug/L	4.1	3.88	108	54.8	81.2	EPA 200.8	1	
Mercury (Hg)	2 ug/L	ND	ND	ND	ND	ND	EPA 245.1	0.2	
Molybdenum (Mo)	210 ug/L	2.79	3.7	7.68	5.34	6.23	EPA 200.8	1	
Selenium (Se)	50 ug/L	1.42	ND	1.2	5.56	1.69	EPA 200.8	1	
Silver (Ag)	50 ug/L	ND	ND	ND	ND	ND	EPA 200.8	0.25	
Sulfate (SO4)	250000 ug/L	294000	348000	331000	291000	402000	EPA 300.0	30	Above domestic water supply standards
Thallium (Tl)	2 ug/L						EPA 200.8	TBD	Recovering 2021 data from lab, will sample prior to May Report
Uranium (U)	16.8 ug/L	6.08	7.66	13	16.1	16.5	EPA 200.8	0.5	
Vanadium (V)	100 ug/L	1.62	1.23	3.07	5.84	5.06	EPA 200.8	0.05	
Zinc (Zn)	2000 ug/L	ND	1.46	28.1	8.32	6.96	EPA 200.8	1	
Foaming Agents	500 ug/L	ND	ND	ND	ND	ND	SM 5540C	100	
pH	0 6.5-8.5	7.39	7.3	7.47	7.43	7.32	SM4500	NA	
Phenol	300 ug/L	ND	ND	ND	ND	ND	EPA 8270D	10	
Color	15 color units						TBD	NA	Analyte not reported, RMCC to sample prior to May annual Report
Corrosivity	Non-Corrosive						TBD	NA	Analyte not reported, RMCC to sample prior to May annual Report
Total Coliforms (MPL/100ML)	2.2 org/100mL (30 day avg)	>2400	>2400	ND	ND	ND	SMEWW 9223B(b)	1	Above domestic water supply standards
TDS	1.25 x background (mg/L)	696	730	594	667	770	SM2540C	10 mg/L	

<sup>1</sup> For the accompanying report, please see RMCC's March 31, 2023, Response to TR2, Adequacy Review 1.

**Figure 2: Nix Groundwater Levels, Wells, and Adjacent Mine Sites<sup>2</sup>**

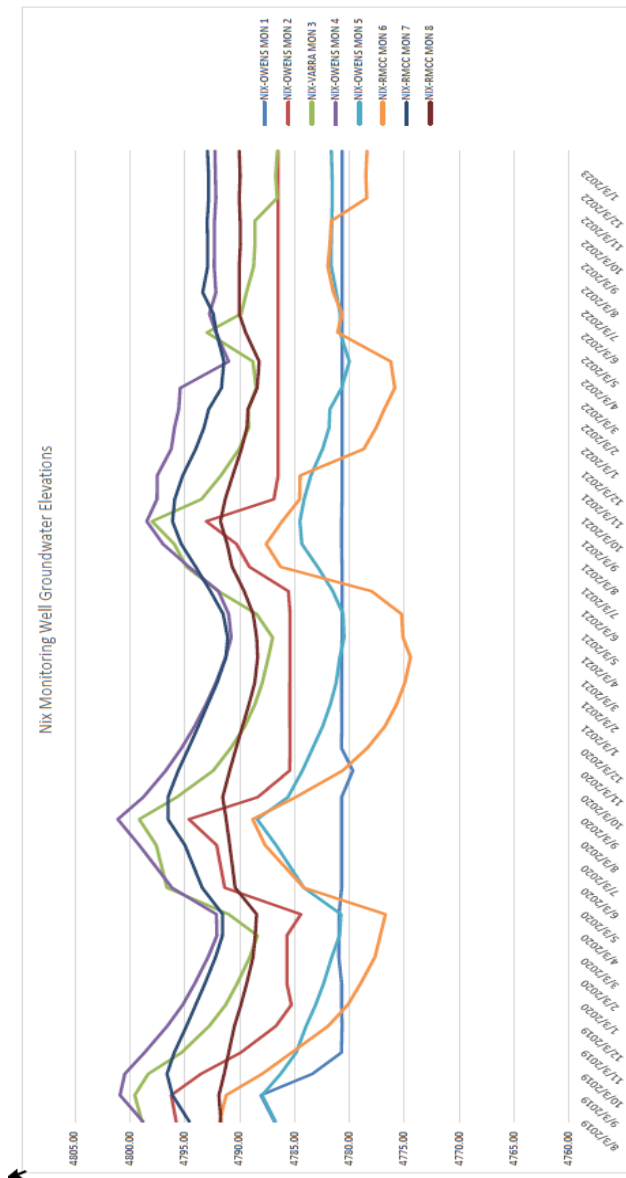


<sup>2</sup> For the full figure and accompanying report, please see RMCC's March 31, 2023, Response to TR2, Adequacy Review 1. Figure 3 has been modified since the adequacy review to include MW 9. Four piezo wells, not shown here, are found in the northernmost cell, and will be removed after leak testing (see Table 2 for locations).

## 2.2 Baseline Groundwater Quantity Data

RMCC has been monitoring groundwater levels since August 2019, as shown in **Figure 3** (some measurements commenced long before 2019 but are not shown here). The seasonality of groundwater levels is noted. Several wells (see, e.g., Nix-Owens-Mon 1, Nix-Owens-Mon 2, Nix-Owens-Mon 4A) have run dry around the same time as the nearby Raptor Materials pit was dewatered for mining; RMCC will continue to test those wells for water.

**Figure 3: Groundwater Hydrographs<sup>3</sup>**



<sup>3</sup> For the accompanying report, please see RMCC's March 31, 2023, Response to TR2, Adequacy Review 1.

### 3. WATER QUALITY MONITORING

#### 3.1 Introduction

As part of this Sampling and Analysis Plan (Plan), the Operator will test for water quality at Nix. The purpose of this Plan is to protect the integrity of the region's groundwater quality and to meet the requirements set forth in DRMS rules and regulations and the Colorado Department of Public Health and Environment (CDPHE) Regulation No. 41. More specifically, the Plan will provide baseline and long-term water quality data for surface and groundwater conditions at the site. Long-term monitoring results will be compared to baseline conditions to determine if gravel pit operations have impacted water quality either from mining activity or from trucks moving mined material offsite.

The Plan provides for the collection of pre-operational water quality data (baseline data) that will ultimately be used to compare with results from continuing long-term water quality monitoring. Collection of pre-operational groundwater levels has also occurred as part of the Plan.

#### 3.2 Sampling Methodology

This section identifies the groundwater sampling locations, selected parameters, frequency of tests, analytical techniques, the method of interpreting the results of the tests, and general program operation.

##### 3.2.1 Background Monitoring and Point of Compliance (POC) Locations

Seven water quality sampling wells have been identified to evaluate pre-operational water quality and potential impacts to surface and groundwater. An additional six wells will be monitored for groundwater elevations, but not sampled for water quality. The location of the monitoring locations is shown above in **Figure 2**; the locations and their purpose are summarized in **Table 2** below.

**Table 2: Groundwater Monitoring Stations**

Station	Type	POC Well	Location	Purpose
Nix-Owens-Mon 1	Water Elevation	No	Southwestern perimeter of site.	To establish groundwater flow direction, not used for water quality sample collection. Included in monthly water level sampling.
Nix-Owens-Mon 2	Water Quality & Water Elevation	No	Southwestern perimeter of site.	To establish upgradient water quality in the southwest corner of the site. Can be compared against other downstream wells to determine potential influence from mining operations.
Nix-Varra-Mon 3	Water Elevation	No	Southwestern perimeter of site.	To establish groundwater flow direction, not used for water quality sample collection. Included in monthly water level sampling.

Nix-Owens-Mon 4A	Water Quality & Water Elevation	No	Southeastern corner of site.	To monitor the groundwater upgradient of the central portion of gravel pit. Can compare results to the downgradient station results to determine if any impacts to groundwater have occurred.
Nix-Owens-Mon 5A	Water Quality & Water Elevation	Yes	Western perimeter of site.	To monitor the groundwater downgradient of the gravel pit & influence from nearby mining operations. Can compare results to the upgradient station results to determine if any impacts to groundwater have occurred.
Nix-RMCC-Mon 6	Water Quality & Water Elevation	Yes	Western perimeter of site.	To monitor the groundwater downgradient of the gravel pit. Can compare results to the upgradient station results to determine if any impacts to groundwater have occurred.
Nix-RMCC-Mon 7	Water Quality & Water Elevation	No	Eastern perimeter of site.	To monitor the groundwater upgradient of the mining operation. Can compare results to the downgradient station results to determine if any impacts to groundwater have occurred.
Nix-RMCC-Mon 8	Water Quality & Water Elevation	No	Northern perimeter of site.	To monitor the groundwater upgradient of the mining operation. Can compare results to the downgradient station results to determine if any impacts to groundwater have occurred.
Nix-RMCC-Mon 9	Water Quality & Water Elevation	Yes	Northwest corner of site.	To monitor the groundwater downgradient of the gravel pit. Installed in April 2023. Can compare results to the upgradient station results to determine if any impacts to groundwater have occurred.
Piezo BH-5B	Water Elevation	No	North of Piezo BH-5C, in cell 2.	To establish groundwater flow direction, not used for water quality sample collection. Included in monthly water level sampling.
Piezo BH-5C	Water Elevation	No	Northwestern mining envelope, in cell 2.	To establish groundwater flow direction, not used for water quality sample collection. Included in monthly water level sampling.
Piezo BH-14	Water Elevation	No	On eastern site perimeter, in cell 2.	To establish groundwater flow direction, not used for water quality sample collection. Included in monthly water level sampling.
Piezo BH-21A	Water Elevation	No	Central western perimeter, on southern perimeter of cell 3.	To establish groundwater flow direction, not used for water quality sample collection. Included in monthly water level sampling.

The following wells have been identified as the POC wells: Nix-Owens-Mon 5A, Nix-RMCC-Mon 6 and Nix-RMCC-Mon 9. Note: Nix-RMCC-Mon 9, in the northwest corner of the site, was installed in April 2023 at DRMS's request to provide data in the most downgradient point in that area of the permit.

Wells Nix-Owens-Mon 2 and Nix-RMCC-Mon 6, located upstream and downstream, respectively, of the southwest mining envelope (including Cell 1, Cell 6, the proposed plant, siltation pond, and freshwater pond) will allow characterization of groundwater impacts of operations to the groundwater quality. Wells Nix-Owens-Mon 4A and Nix-Owens Mon 5A, located upstream and downstream of the southern mining envelope will allow determination of groundwater impacts from Cells 4 and 5. Similarly, wells Nix-RMCC-Mon 7 and Nix-RMCC-Mon 5A, located upstream and downstream of the northwestern mining envelope will allow determination of groundwater impacts across Cell 2 and Cell 3. Nix-RMCC-Mon 9 will be compared against Nix-RMMC-Mon 8 to evaluate influence across the northern perimeter of the site. Because Nix will use slurry walls, any water quality effects on groundwater are expected to be negligible.

### **3.2.2 Monitoring Frequency**

The Plan has two phases: Baseline and Operational. Baseline Phase consists of sample collection that has already occurred prior to, or will occur subsequent to and in conjunction with, mining activity on the site; that is, after consultation with and approval by DRMS, the Operator will continue to develop its baseline dataset at the same time it commences mining operations. Operational Phase will occur on an ongoing basis once the baseline data is acquired; and will continue until mining ceases.

#### **3.2.2.1 Baseline Phase (Prior to Mining Activity)**

RMCC has initiated its pre-operational water quality sampling program. Groundwater levels have been measured monthly since August of 2019 or before. Initial baseline water quality samples were collected in June 2021 at the following locations: Nix-Owens-Mon 4A, Nix-Owens-Mon 5A, Nix-RMCC-Mon 6, Nix-RMCC-Mon 7, and Nix-RMCC-Mon 8.

RMCC Environmental Manager Scott Legg has discussed the 2021 results with DRMS Environmental Protection Specialist Eric Scott. RMCC sampled four wells again in April 2023. Though results are pending, the testing will confirm any exceedances and will provide results for analytes missed in 2021. Further, RMCC will continue monitoring for quality until it has five quarters worth of data, then proceed in the future with annual testing every June.

The first round of subsequent samples was collected on April 17, 2023. Sample collections were attempted at the following dry wells: Nix-Owens-Mon 1, Nix-Owens-Mon 2, and Nix-Owens Mon 4. Nix-Varra-Mon 3 is a 1" well and is deemed not suitable for water quality sampling. Nix-RMCC-Mon 9, was installed on April 12, 2023, and will be included in future sampling events. Additional subsequent sampling events at all seven water quality locations will be conducted in June 2023, August 2023, and October 2023. Two additional sampling events at Nix-RMCC-Mon 9 will be conducted if deemed necessary by DRMS to collect up to five baseline samples at each well. At the end of the baseline phase, RMCC will submit a Baseline Data Summary report as a Technical Revision.

#### **3.2.2.2 Operational Phase (Long-Term Operation)**

Water quality samples will be taken annually in June at each of the seven water quality wells for the duration of mining operations. The frequency of sampling for long-term monitoring can be modified in the future if water quality impacts are detected. Monthly water levels will continue to be collected at each monitoring well, however the Piezo wells may be removed after leak testing occurs.

### **3.2.3 Monitoring Parameters**

The Operator will conduct field and laboratory analysis on 37 different water quality parameters at each site, based on CDPHE Regulation 41, Tables 1-4. A proposed list of

the 37 parameters is shown in **Table 3**. **Table 4** includes the list of omitted analytes and justifications as previously discussed with and approved by DRMS staff. All analysis of “non-field” measurements will be performed by a State of Colorado-certified laboratory that follows accepted industry standards and quality assurance/quality control (QA/QC) procedures.

**Table 3: Baseline and Operational Water Quality Parameters**

Analyte	Phase	Analytical Methodology
Aluminum (Al)	Dissolved – lab filtered	M200.8 ICP
Antimony (Sb)	Dissolved – lab filtered	M200.8 ICP
Arsenic (As)	Dissolved – lab filtered	M200.8 ICP
Barium (Ba)	Dissolved – lab filtered	M200.8 ICP
Beryllium (Be)	Dissolved – lab filtered	M200.8 ICP
Boron (B)	Dissolved – lab filtered	M200.8 ICP
Cadmium (Cd)	Dissolved – lab filtered	M200.8 ICP
Chloride (Cl)	Dissolved – lab filtered	EPA 300.0
Chlorophenol	Total	SM8270
Chromium (Cr)	Dissolved – lab filtered	M200.8 ICP
Cobalt (Co)	Dissolved – lab filtered	M200.8 ICP
Copper (Cu)	Dissolved – lab filtered	M200.8 ICP
Conductivity	Field	SM4500
Cyanide [Free]	Free	4500-CN-E
Fluoride (F)	Dissolved – lab filtered	M200.8 ICP
Iron (Fe)	Dissolved – lab filtered	M200.8 ICP
Lead (Pb)	Dissolved – lab filtered	M200.8 ICP
Lithium (Li)	Dissolved – lab filtered	M200.8 ICP
Manganese (Mn)	Dissolved – lab filtered	M200.8 ICP
Mercury (Hg) (inorganic)	Dissolved – lab filtered	M200.8 ICP / EPA 245.1
Mercury (Hg)	Dissolved – lab filtered	M200.8 ICP
Molybdenum (Mo)	Dissolved – lab filtered	M200.8 ICP
Nickel (Ni)	Dissolved – lab filtered	M200.8 ICP
Nitrate (NO <sub>2</sub> )	Dissolved – lab filtered	EPA 300.0
Nitrite & Nitrate (NO <sub>2</sub> + NO <sub>3</sub> )	Dissolved – lab filtered	EPA 300.0
Nitrite (NO <sub>3</sub> )	Dissolved – lab filtered	EPA 300.0
pH	Total	SM4500
Phenol	Total	SM8270
Selenium (Se)	Dissolved – lab filtered	M200.8 ICP
Silver (Ag)	Dissolved – lab filtered	M200.8 ICP
Sulfate (SO <sub>4</sub> )	Dissolved – lab filtered	EPA 300.0
Thallium (Tl)	Dissolved – lab filtered	M200.8 ICP
Total Dissolved Solids (TDS)	Dissolved – lab filtered	SM2540
Total Nitrate+Nitrite	Dissolved – lab filtered	EPA 300.0
Uranium (U)	Dissolved – lab filtered	M200.8 ICP
Vanadium (V)	Dissolved – lab filtered	M200.8 ICP
Zinc (Zn)	Dissolved – lab filtered	M200.8 ICP

**Table 4: Omitted Parameters from CDPHE Regulation 41, Tables 1-4**

Analyte	CDPHE Reg 41 Citation	Justification
Total Coliforms	Table 1 - Domestic Water Standards - Human Health Standards	Mining operations are not expected to impact bacteriological coliform levels nor can be reasonably attributed to mining operations.
Asbestos	Table 1 - Domestic Water Standards - Human Health Standards	Asbestos will not be used in mining operations and cannot be reasonably attributed to mining operations.
Radiological Elements	Table 1 - Domestic Water Standards - Human Health Standards	Mining operations are not expected to impact radiological levels; levels of this parameter cannot be reasonably attributed to mining operations.

Color	Table 2 - Domestic Water Standards - Drinking Water Standards	Mining operations are not expected to affect aquifer color; changes of this parameter cannot be reasonably attributed to mining operations.
Corrosivity	Table 2 - Domestic Water Standards - Drinking Water Standards	Mining operations are not expected to affect aquifer corrosivity; pH will be analyzed.
Foaming Agents	Table 2 - Domestic Water Standards - Drinking Water Standards	Mining operations are not expected to affect aquifer foaming, no large-scale use of surfactants is planned, and cannot be reasonably attributed to mining operations.
Odor	Table 2 - Domestic Water Standards - Drinking Water Standards	Mining operations are not expected to affect aquifer odor. Olfactory observations will be noted during sample collection; changes of this parameter cannot be reasonably attributed to mining operations.

### 3.2.4 Sampling Protocol

The following protocol will be used to collect water samples:

#### 3.2.4.1 Bottles

Specific bottles will be ordered from the analytical laboratory to collect the water samples. The laboratory will be notified they will be responsible for filtering dissolved samples prior to placing a bottle order.

#### 3.2.4.2 Static Water Levels

Static water levels in the wells will be measured and recorded using a water level well sounder prior to any pumping of the well. The measurement location at the top edge of the casing will be marked with permanent ink pen and should be touched up with fresh ink at each sampling event.

#### 3.2.4.3 Purging

Monitoring wells will be purged prior to sample collection. Either a low-flow submersible pump or polyurethane bailers will be used to purge the wells and collect samples, depending on the required purge volume. Pumps will be decontaminated prior to being placed in each well, whereas new bailers will be used and disposed of for each well. Removal of three well casing volumes will occur prior to sampling. The static volume of water in the well will be calculated using the following equation:

$$V = r^2h(0.163)$$

Where

V = static volume of water in well (in gallons)

r = inner radius of well casing (in inches)

h = length of water column (in feet) which is equal to the total well depth minus depth to water.

0.163 = a constant conversion factor that compensates

for the conversion of the casing radius from inches to feet for 2-inch diameter wells and the conversion of cubic feet to gallons, and pi (A). This factor would change for different diameter wells.

The purged volume of water will be measured using a five-gallon bucket to verify that the static volumes in the wells are evacuated prior to sample collection. Should the well purge dry prior to three casing volumes being removed, samples will be collected first draw after appropriate recharge.

#### **3.2.4.4 Field Measurements**

Measurement of pH, temperature, and specific conductivity will be collected in the field. Visual and olfactory observations will be documented on the field sheets in **Appendix A**. The meters will be cleaned and calibrated prior to measurements.

#### **3.2.4.5 Handling of Sample Bottles**

Water will be pumped or collected directly into sample bottles. The date and time of sample collection will be marked on the bottle along with who collected the sample and the site location. Samples will then be placed in a cooler with ice.

#### **3.2.4.6 Chain of Custody**

A chain of custody form will be completed and will indicate what analysis needs to be run, the date and time collected, sample identification, and who assembled the sample. The samples will be delivered to the lab on the day of sample collection, or stored below 6°C in a refrigerator until delivery is available on the following day. Dissolved parameters are to be filtered by the laboratory.

### **3.3 Analytical Procedures: Comparison to State Water Quality Standards**

The analytical results will be compared to the regulatory limits established by the Colorado Water Quality Control Commission. The groundwater water quality data from these wells will be compared to standard values in Tables 1-4 of CDPHE Regulation 41. In the case of multiple standards, the more stringent standard will apply. Analytical results from baseline water quality sample collection will be used to determine if the above standards are appropriate for all parameters. Should it be determined that background concentrations of any parameters are elevated due to prior existing activity or ambient conditions, the Operator will work with DRMS to propose modified standards, considering pre-mining land use activity. After final standards are established, if exceedances of any of the water quality standards are detected in POC wells, the Operator will notify DRMS and initiate a water quality mitigation plan as discussed in more detail below.

### **3.4 Water Quality Mitigation Plan**

If limits are exceeded, the Operator will implement the following mitigation procedures:

- Notify DRMS of the exceedance within seven days of either receiving the analytical report from the laboratory or completing the described regression analysis.
- Identify the potential causes/sources of the exceedance parameters.
- Implement supplemental water quality sampling. If exceedances are detected, the Operator will collect samples to confirm the exceedance as soon as practicable, but no longer than 14 days after receiving the exceedance. If confirmed, the Operator will work with DRMS to establish an appropriate supplemental sampling schedule. Only parameter(s) which exceed the regulatory limits will be analyzed and will continue to be monitored until the parameter(s) drop below the allowable limit.

The Operator will begin implementing one or more mitigation measures if mining and reclamation activity is determined to be a significant factor to groundwater changes requiring mitigation. Mitigation measures may include, but are not limited to:

- Review chemical inventory for elevated analytes and develop plans for chemical containment, abatement, reduction and/or substitution. Confirm effectiveness of appropriate controls surrounding chemical spill.
- Review effectiveness of slurry walls and source area containment.
- Collect additional samples of stockpiled materials and review placement and containment of stockpiles if identified analytes are detected in elevated rates.
- Remove suspected contaminated materials and replace with clean fill or another suitable material.

### **3.5 Annual Report**

A water quality summary report will be prepared annually and submitted with the Operator's annual DRMS report. The report will present summaries of the data collected during the previous year and compare such data to State water quality standards and the baseline monitoring results.

## **4. WATER LEVEL MONITORING PLAN**

### **4.1 Monthly Monitoring**

The Operator's water level monitoring plan submitted in June 2021 has been approved by DRMS. Consistent with that plan, the Operator will continue to monitor its groundwater level wells monthly to improve the operator's knowledge of the water table on- and off-site during operations.

### **4.2 Criteria and Trigger Values**

Certain water level deviation observed during monthly water level monitoring may initiate additional investigation. Specifically, once mining operations commence, if RMCC observes water levels in a monitoring well that are more than two feet above or below historic maximum or minimum levels observed for that well for more than two consecutive months, the Operator will take steps consistent with the Groundwater Monitoring Plan previously submitted and approved. Some of those steps include:

- The Operator will evaluate the cause and will notify DRMS within seven days.
- After the DRMS has been notified, the Operator will review the data and available information and submit a report to DRMS within 30 days. The evaluation will include discussions with the well owner who has contacted the operator regarding a concern, if any, and review of baseline data from the well and vicinity to evaluate whether changes may be due to seasonal variations, climate, mining, slurry wall lining or other factors. The report will identify the extent of potential or actual impacts associated with the changes.
- If the extent of groundwater changes due to mining or reclamation activities is determined to be a significant contributing factor that has or may create adverse impacts, the mining-associated impacts will be addressed to the satisfaction of DRMS.
- The Operator will begin implementing one or more mitigation measures if mining and reclamation activity is determined to be a significant factor to groundwater changes requiring mitigation.
- Mitigation measures may include, but are not limited to:
  - Placing water in a recharge pond to raise groundwater levels around the well.

- Constructing a local clay liner at the edge of the mine Cell (i.e., between the dewatering point and the well) in order to raise water levels on the well side of the liner and mitigate dewatering effects.
- Cleaning the well to improve efficiency.
- Providing an alternative source of water or purchasing additional water to support historic well use in terms of water quantity and quality. If needed, water quality parameters will be checked in affected wells to ensure alternative sources support historic use.
- Modifying a well to operate under lower groundwater conditions. This could include deepening the well or lowering pumps. All work would be done at the operator's expense with the exception of replacing equipment that was non-functional prior to mining.

## **Attachment A: Field Sheets and Instrument Calibration Sheet**

**Well Sampling Log--SAMPLE**  
**Nix Sand and Gravel Mine**  
**Groundwater Monitoring Field Sheet**

Sample Point: **Nix-Owens-MON 2**

Date: \_\_\_\_\_

Sampler Name: \_\_\_\_\_

Time: \_\_\_\_\_

**Weather/Field Conditions:**

\_\_\_\_\_

\_\_\_\_\_

**Groundwater Monitoring Well Purging/Sampling:**

Total Well Depth (TD) = \_\_\_\_\_ feet

Initial Depth to Water (DTW)= \_\_\_\_\_ feet

Casing Volume = 0.163gal (for 2" diam. well) x (TD – DTW) = \_\_\_\_\_ gallons

Purge Volume = (Casing Volume x 3) = \_\_\_\_\_ gallons

Purge Method: ☐ Bailer ☐ Pump

Time	Volume Removed (gal)	pH (s.u.)	Temp (°C)	Sp. Cond. (μS/cm.)	Odor	Color / Sediment	Bubbles / Effervescence	Comments

**Final Field Parameters:**

Time	Volume Removed (gal)	pH (s.u.)	Temp (°C)	Sp. Cond. (μS/cm.)	Odor	Color / Sediment	Bubbles / Effervescence	Comments

**Analysis Requested:**

**Dissolved Metals:** Ag, Al, As, Ba, Be, B, Cd, Cr, Co, Cu, F, Fe, Pb, Li, Mn, Hg, Mo, Ni, Sb, Se, Tl, U, V, Zn (Lab filtered)

**Anions:** Cl, NO<sub>2</sub>, NO<sub>3</sub>, NO<sub>2</sub> + NO<sub>3</sub>, SO<sub>4</sub> (Lab filtered)

**SVOC:** Phenol, Chlorophenol

**Misc.:** pH, TDS, Free Cyanide

## Field Instrument Calibration Sheet

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**Instrument:**Make: Oakton Model: PCTSTestr 50 Serial : 2897197

Date: \_\_\_\_\_

Pre-Sampling Time: \_\_\_\_\_ Post Sampling Time: \_\_\_\_\_

Performed By: \_\_\_\_\_

**Calibration**

The multimeter must be calibrated/verified **before and after** sample collection. In addition, the meter must be calibrated/verified for **all** field parameters that are to be measured and recorded.

Perform a three-point pH calibration. Record measured value for each buffer solution after calibration has been completed. In addition, record pH mV values.

Calibration/Standard	Pre-Sampling Value		Post Sampling Value	
	Temp (°C)	Result (s.u.)	Temp (°C)	Result (s.u.)
<b>pH 4.0 Buffer</b> Lot#: 2GI306 Exp Date: 9/2024				
<b>pH 7.0 Buffer</b> Lot#: 3ga766 Exp Date: 1/2025				
<b>pH 10.0 Buffer</b> Lot#: 3GA1134 Exp Date: 1/2025				
<b>Conductivity Standard 1413 (µS/cm)</b> Lot#: 3GB162 Exp Date: 2/2024				