BRANNAN
Sand and Gravel Co. / Ready Mix
Founded 1906

To: Eric Scott, Environmental Protection Specialist
Division of Reclamation, Mining & Safety ("Division")
Room 215, c/o: Active Mines Program
1001 E 62nd Ave.
Denver, CO 80216

From: Steve Kelton (skelton@brannan1.com)

Subject: Technical Revision 2, Nix Sand & Gravel Mine (M-2001-046), Response to Adequacy Review 1

Date: March 31, 2023

This letter is the Operator's response to a March 10, 2023 letter from the Division, styled as Adequacy Review 1 to Technical Revision 2 ("TR2"), M-2001-046 (Nix Sand and Gravel Mine).

As an initial matter, Brannan grants a two-week extension of the decision date of this TR2, from April 3, 2023, to April 17, 2023.

As originally presented, the Operator's TR2 submittal was intended to complete the Reclamation Permit record with respect to certain technical issues related to groundwater monitoring. Specifically, the Operator submitted results of a baseline water quality study and ongoing monthly well monitoring data, and the Operator reiterated its commitment to a groundwater monitoring plan submitted as part of the AM1 application approved on June 28, 2021. An email sent to the Division by the Operator on March 2, 2023, and attached to this letter, provides additional detail on how this submittal completes the record in accordance with the terms of the approved permit.

The Division's March 10th letter indicates that a significant disconnect remains as to both the risks presented by the M-2001-046 operation and the administration of protective measures for water quality. The Operator takes this issue seriously, and we have therefore reviewed the Construction Materials Rules, relevant statutes, Water Quality Control Commission ("WQCC") rules and statutes, the Division's Groundwater Monitoring Technical Bulletin, and the M-2001-046 permit history regarding the questions presented and appropriate resolution of TR2.

The Operator has also engaged the services of hydrogeologic and Reclamation Permit experts (DiNatale Water Consultants and Civil Resources LLC/Engineers and Planners, respectively). Initial feedback from those experts is attached; this technical correspondence provides responsive information to each of the Division's enumerated issues in its Adequacy Review 1.

It is first necessary to note that the Division assumes that the Nix operation presents a risk to groundwater quality. The Operator has never concurred with this assessment, and the record's copious discussion of water and mining operations fails to elucidate any significant risk to water quality. The AM1 groundwater monitoring program incorporated a water quality component as a compromise. However, the application of the Division's Rule 3.1.7 generally requires a reasonable potential that the operation will adversely affect water quality. The Nix site, as the DiNatale report concludes, does not have that reasonable potential.

The Division's spontaneous and unsupported introduction of presumed water quality impacts has been a consistent source of confusion in the record of M-2001-046. It is noteworthy that the directly adjacent M-2015-033 operation did not experience any such scrutiny in fundamentally the same regulatory regime. There is no pervasive or even isolated condition in this vicinity, no affected party, and no permitting history that justifies the extraordinary level of concern placed on groundwater quality at the Nix site.

Overall, the Operator finds it difficult to square the conclusions of these experts with the Division's various assertions and examples manifesting a presumption that sand and gravel mining, largely in a slurry-walled situation at the Nix site, will cause water quality conditions to decline. The Division's assumptions in this regard are unreasonable given the paucity of data in the M-2001-046 record supporting such a conclusion.

As an example of an approved groundwater monitoring program, the Division forwarded to us a lengthy compilation of both baseline monitoring results and a mitigation plan for a controversial project in the Colorado River basin that was ultimately disapproved by the Mined Land Reclamation Board ("MLRB"). The subject matter of opposition and the stated reasons for MLRB denial of that project focused heavily on groundwater conditions. As the Operator of a distant, non-controversial, already-approved project on a South Platte River tributary, we see no obvious factual parallel or precedential value for the Peak Ranch case. In terms of the actual science, this Operator has submitted well monitoring data and lab results comparable in scope to the bulk of the technical content of the purported model plan.

On the final page of its March 10th letter, the Division apparently seeks to implement and enforce the groundwater monitoring program as it was submitted with AM1. AM1 was approved in June 2021, and the groundwater monitoring program was structured to establish pre-mining water quality conditions and subsequent monitoring of any effects on water quality caused by mining. According to initial sampling results, certain monitoring wells on the perimeter of the permit site showed several water quality exceedances. It may be appropriate to discuss how these ambient conditions are reflected in water quality compliance plans, especially as WQCC Regulation 41 provides for alternate accounting of such conditions in certain circumstances. The Operator also agrees with the Division that it is appropriate to conduct confirmation sampling of exceedances to ensure that proper collection and lab procedures were followed.

The Division also notes an inadvertent delay in submittal of lab results from the baseline study. A personnel change within the Operator's environmental staff was integral to this delay, but we do not expect that present and future operations at Nix will be affected. At present, the Operator is fully staffed; additionally, the Operator is developing both company-wide and site-specific templates to ensure reporting is timely and comprehensive of all monitoring and maintenance requirements. At Nix, there is ample information to ensure hydrologic systems are understood in both their pre-existing and current conditions as mining operations commence.

With this letter and the enclosed technical documentation, the Operator urges the Division to accept TR2 as adequate. The Operator will take any and all reasonable measures to ensure that applicable regulatory standards are complied with at the Nix site, including any ongoing discussion of best practices, which may be the subject of future technical revisions as appropriate. At this juncture, the Operator has fulfilled its commitments to provide baseline data and demonstrate an effective program for monitoring fluctuations in the water table. We expect that, in the upcoming May 2023 Annual Report, the inclusion of further water quality and well monitoring data will establish a satisfactory format for routine reporting. By approving TR2, the Division will continue to support operators across the state with predictability based on existing regulatory authority and practice.

Enclosed: March 2, 2023, electronic message to Eric Scott (Division) from Steve Kelton (Brannan)

Technical memoranda ("feedback from hydrogeologic and Reclamation Permit experts")

March 31, 2023

Ready Mixed Concrete Company
Mr. Steve Kelton
2500 East Brannan Way
Denver, CO 80229

RE: Technical Revision 2 Adequacy Review - Nix Mine (Permit M-2001-046), Weld County, Colorado

Dear Mr. Kelton:

This letter is being generated to discuss the history of the Amendment 1 permitting process as it relates to groundwater quality testing and responds to the comments from the Division of Reclamation Mining and Safety in their March 10, 2023 Technical Revision 2 Adequacy Review 1 letter.

Background

The property associated with the Division mining permit M-2001-046 (commonly "Nix Mine") was originally permitted to Owens Brothers Concrete Company on May 30, 2003. The Nix Mine was subsequently sold to the Ready Mixed Concrete Company, LLC and the "Transfer of Permit and Succession of Operator" application was submitted to the Division on October 14, 2004 and approved by the Division on November 4, 2004.

RMCC applied for an Amendment to the Reclamation Permit ("Amendment 1") in 2021 to add 149.6 acres of affected area within the 307.2 acre permit boundary and modify the post mining plan to lined water storage. Amendment 1 was approved June 28, 2021.

As part of the Adequacy Review process of the Amendment 1 application, the Division commented that the site should, "submit a monitoring plan to detail where and how water levels and chemistry will be monitored to document that impacts to the prevailing hydrologic balance will be minimized and mitigated if necessary." In response to this comment, Civil Resources, LLC ("CR") drafted a letter with the following response, "See attached monitoring plan and updated Exhibit G. Water levels for wells 1-8 have been collected monthly by RMCC since August 2019. Water levels will continue to be collected monthly for the life of the mine. Water levels on wells 9 through 12 were drilled in the later part of 2019 and water levels have been collected since January 2020." Included with the response letter was a Groundwater Monitoring and Mitigation Plan that pertained to groundwater elevation monitoring. Water quality sampling was not included with the response to Adequacy Review 1.

On June 9, 2021, RMCC received comment in Adequacy Review 2 requesting a, "…Sampling and Analysis plan describing how the operator will document ambient groundwater conditions relative to Tables 1-4 of the Interim Narrative Standard prior to mining, as well as insure/document that the water quality will meet the Interim Narrative Standards during operation and prior to release." The following response to this comment was sent in the June 4, 2021 letter to the Division: "To document ambient groundwater conditions prior to mining, RMCC collected samples from Nix-Owens MON 4, Nix-Owens MON 5, Nix-RMCC MON 6, Nix-RMCC MON 7, and Nix-RMCC MON 8 on June 3, 2021. These wells were selected to provide background water quality data along each roadway and the Varra pit. The analytes listed on Tables 1-4 of the Interim Narrative Standards, excluding the radiological section, were tested for in each of the wells sampled. The lab results from this analysis will be included with the next annual report for the site. A list of analytes tested is included (see attached Analytes For Baseline Sampling)."

Following a phone call with an RMCC representative and the Division, RMCC requested that CR add a Groundwater Quality Monitoring Plan section to specifically include what analytes will be sampled for, commit to water quality sampling

in June of each year, and commit to submitting information in the annual report. This section was added to the "Groundwater Monitoring Plan" document and submitted with the Adequacy Review Response 3 letter dated June 23, 2021. In this letter, CR indicated that the Groundwater Quality Monitoring Plan section had been added for review even though the operator believes that there is no reasonable expectation that adverse impacts to water quality will occur due to the planned operation. Amendment 1 was approved on June 28, 2021.

Regulation 41 and DRMS Technical Guidance Implementation

CR performed a review of the DRMS permits approved since the Division's Groundwater Monitoring and Protection Technical Bulletin was implemented in November 2019. The review consisted of screening active 112C mine sites in Larimer, Weld, Boulder, and Adams counties by approval dates after November 2019. Seventeen (17) sites were determined to have been permitted and active since November 2019. Of these seventeen sites, only seven (7) encountered groundwater and had either slurry wall lined cells or were dry mined utilizing dewatering trenches. Only one of these sites (M-2020-007) required analytical testing as a permit condition and only baseline sampling of the neighboring wells. The remaining six (6) sites (M-2018-060, M-2019-025, M-2020-058, M-2019-028, M-2018-039, M-2022-009) required monthly groundwater elevation monitoring but no analytical testing.

There are four (4) permitted construction materials (112c) mines within one (1) mile of the site. Reviewing documents from the DRMS laserfische website, none of these sites have a requirement for groundwater quality testing or analysis even though being permitted while Regulation 41 was in place. All of these mines (M-2015-033, M-1999-006, M-2009-018, and M-1996-052) are unlined or partially lined pits with exposed groundwater.

The majority of the Nix Mine will be soil-bentonite slurry wall lined prior to exposing groundwater. The addition of the slurry wall lined cells will isolate the pit and working face from the hydrologic system. As the pit is dewatered any leakage through the slurry wall or bedrock will be into the pit. The trapped groundwater in the pit will be pumped to the permitted discharge point to surface waters, which is regulated under the Colorado Department of Public Health and Environment CDPS General Permit and under the National Pollutant Discharge Elimination System.

As noted in the March 31, 2023 DiNatale letter, with the slurry walls in place and the site operating under CDPHE Discharge Permit and a Spill Prevention Control and Countermeasure plan (SPCC) among other factors, it is unlikely that the site will be a source of contamination to the groundwater table.

Responses to TR-02 Adequacy 1

With that background in place, CR has the following responses to the Division's points laid out in their March 10, 2023 TR-2 Adequacy letter:

1. No slurry walls have been constructed at the site as of yet. Construction for the north slurry wall is slated to begin summer of this year (2023).

2. As noted above, RMCC chose to include the Groundwater Quality Monitoring Plan in the overall Groundwater Monitoring Plan as part of the Adequacy Review Process and the application was subsequently approved. It is unclear which federal laws the Division is referring to in their comment as sand and gravel mining is considered "high-volume, low-hazard" and is thus exempt from regulation under the Resource Conservation and Recovery Act (RCRA) and has a SPCC for compliance under the Clean Water Act (CWA). In Adequacy Response 3, RMCC did commit to submitting the baseline data with a Technical Revision. RMCC did not commit to submitting an additional Sampling and Analysis Plan as this was submitted with Adequacy Response 3 as was indicated in the response letter. It was assumed that this plan was approved along with the Application in June 2021.

As noted above in the discussion of the Division's implementation of Rule 41, at the time of approval this plan exceeded the monitoring requirements for similar permits issued in the Platte River alluvial watershed prior to and during the time of this application. The plan was written to include the following:

a. A site wide discussion of the hydrogeologic setting prior to disturbance.

b. Allows for a determination of the effects of the permitted activity on the quantity and quality of groundwater and includes monitoring points upgradient and downgradient of the proposed activity.

c. Specifies that the Division will be notified within seven (7) days if any of the standards had been exceeded at the wells sampled. The wells specified for sampling were included upgradient and downgradient at the permit boundary.

Although a sampling protocol was not included in the plan to give operational leeway on sampling methods used, the sampling protocol should follow the methods outlined in the "Manual of Groundwater Sampling Procedures", Scalf, M.R., et al., 1981. National Water Well Associate, Worthington, Ohio, and the lab recommendations for specific sample collection. The methods used should be documented and included in the report to the DRMS.

3. Even though no "Points of Compliance" were expressly named, the current plan specified that the DRMS will be notified if the lab report indicates an exceedance at any of the wells sampled. The wells sampled include three (3) wells downgradient and two (2) wells upgradient of the Nix Mine located at the approximate permit boundary.

4. The apparent, but unconfirmed, exceedances for iron, nitrate, nitrite, nitrite + nitrate, sulfate, and total coliforms are now noted in Table 1. A number of analytes were not requested from the lab or were not noted during sampling which has been noted in Table 1. Table 1 has been updated and reformatted to correct any errors. RMCC will schedule testing to confirm the exceedances from baseline monitoring, obtain results for any missing parameters and will report the results in an updated table to the Division prior to the May annual report.

5. RMCC agreed to confirm analytes that exceeded the most stringent set forth in Tables 1-4 of the Interim Narrative Standards with subsequent testing. The attached 1974 aerial photograph from USGS of the Nix Mine and surrounding area shows that historical land use in the area since at least that time, and likely longer, has been flood irrigated farmland. As noted in the DeNitale letter, there are no domestic wells permitted though CDSS and only two (2) agricultural wells downgradient of the site. Given the historic and continuing agricultural land use in the area, the agricultural groundwater uses downgradient of the site, and the low potential for these pollutants to come from the mining process proposes to continue monitoring these analytes yearly and notifying DRMS per the approved plan if any of the analytes exceed the parameters developed by baseline monitoring. Confirmation testing of the exceedances observed in baseline monitoring should be performed prior to developing reporting parameters based on ambient conditions.

6. Graphic trendline data has been included.

Sincerely,
CIVIL RESOURCES, LLC.

Kyle S. Regan P.G.

Attachments:
Groundwater Monitoring Well Elevation Graph
Table 1 – Groundwater Baseline Data
Monitoring Well Map
USGS – 1978 Nix Mine Area Aerial Photograph

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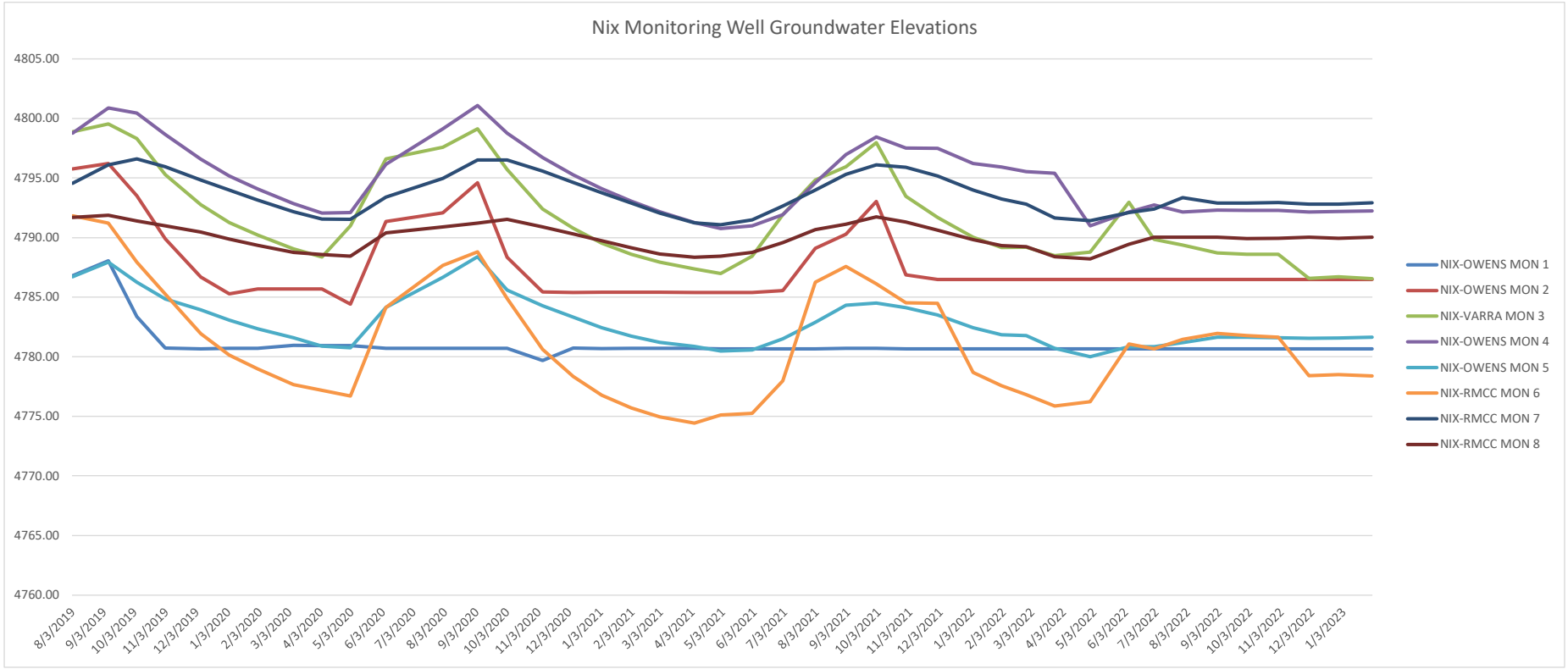
Nix Monitoring Well Groundwater Elevations
4805.00
4800.00
4795.00
4790.00
4785.00
4780.00
4775.00
4770.00
4765.00
4760.00
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NIX-OWENS MON 1
NIX-OWENS MON 2
NIX-VARRA MON 3
NIX-OWENS MON 4
NIX-OWENS MON 5
NIX-RMCC MON 6
NIX-RMCC MON 7
NIX-RMCC MON 8

Table 1 - Groundwater Baseline Data

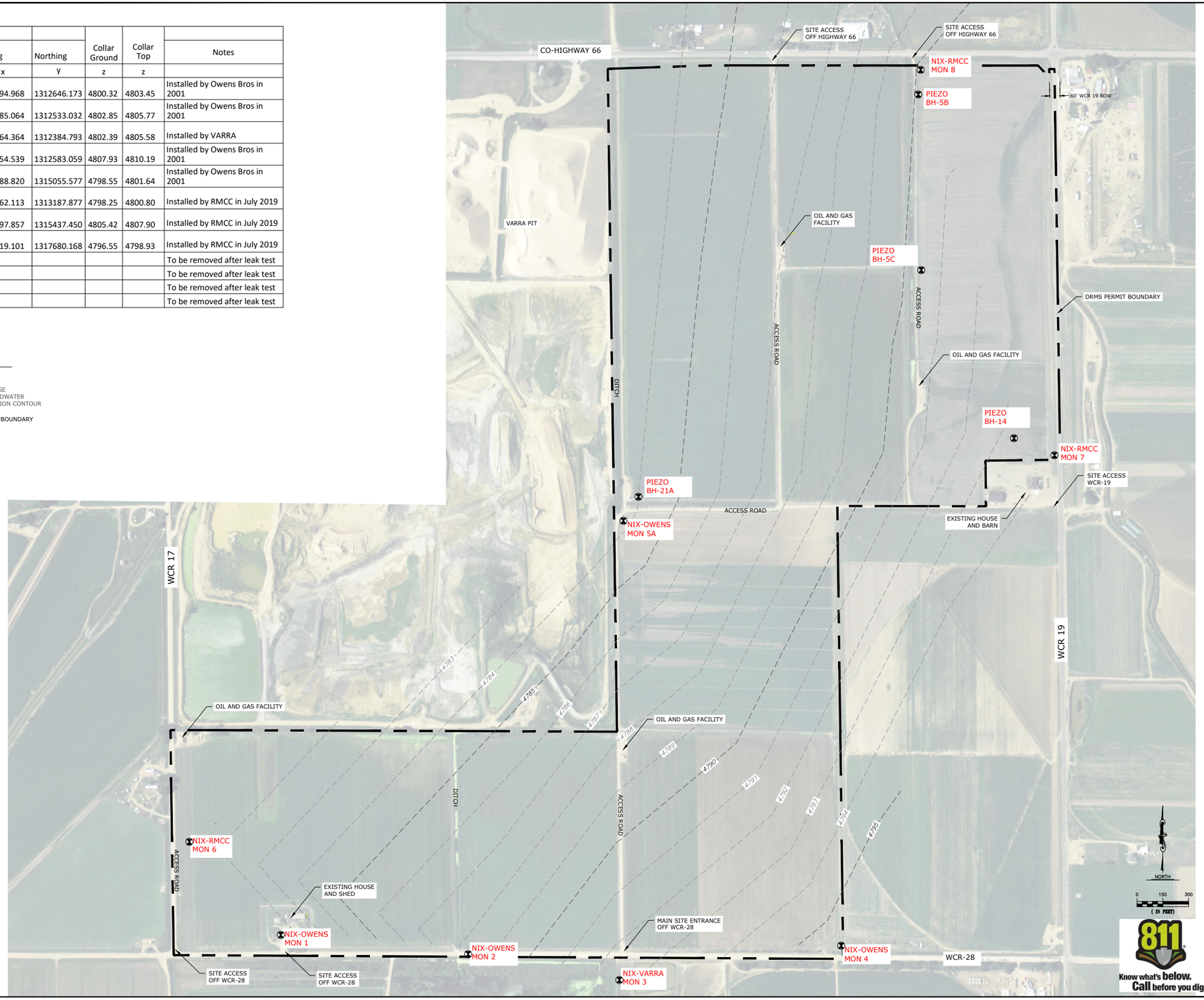
	Compliance Standard		Nix-Owens Mon 4 (ug/L)	Nix-RMCC Mon 7 (ug/L)	Nix-RMCC Mon 6 (ug/L)	Nix-RMCC Mon 8 (ug/L)	Nix-Owens Mon 5A (ug/L)	Method Used	Detection Limit(ug/L)	Notes
Aluminum (Al)	5000	ug/L	309	220	1150	3460	3930	EPA 200.8	50	
Antimony(Sb)	6	ug/L	0.0805	ND	0.831	0.173	0.419	EPA 200.8	0.05	
Arsenic (As)	10	ug/L	ND	ND	0.692	0.967	0.857	EPA 200.8	0.6	
Asbestos	$7.0x10^6$	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 (SO 4)	250000	ug/L	294000	348000	331000	290000	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	

NIX MONITORING WELLS

	Easting	Northing	Collar Ground	Collar Top	Notes
Name	x	y	z	z	
NIX-OWENS MON 1	3166994.968	1312646.173	4800.32	4803.45	Installed by Owens Bros in 2001
NIX-OWENS MON 2	3168085.064	1312533.032	4802.85	4805.77	Installed by Owens Bros in 2001
NIX-VARRA MON 3	3168964.364	1312384.793	4802.39	4805.58	Installed by VARRA
NIX-OWENS MON 4	3170254.539	1312583.059	4807.93	4810.19	Installed by Owens Bros in 2001
NIX-OWENS MON 5A	3168988.820	1315055.577	4798.55	4801.64	Installed by Owens Bros in 2001
NIX-RMCC MON 6	3166462.113	1313187.877	4798.25	4800.80	Installed by RMCC in July 2019
NIX-RMCC MON 7	3171497.857	1315437.450	4805.42	4807.90	Installed by RMCC in July 2019
NIX-RMCC MON 8	3170719.101	1317680.168	4796.55	4798.93	Installed by RMCC in July 2019
Piezo BH-5B					To be removed after leak test
Piezo BH-5C					To be removed after leak test
Piezo BH-14					To be removed after leak test
Piezo BH-21A					To be removed after leak test

LEGEND

- MONITORING WELL
- 4783 — AVERAGE GROUNDWATER ELEVATION CONTOUR
- PERMIT BOUNDARY



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303.833.1416
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RMCC
2500 BRANNAN WAY
DENVER, CO 80229

RMCC
NIX GRAVEL MINE
WELD COUNTY, COLORADO

REVISIONS

NO.	DESCRIPTION	DATE

DESIGNED BY: KSR
DRAWN BY: KSR
CHECKED BY: BLH
DATE: 6/30/2021
SCALE: AS NOTED
AS NOTED
JOB NO.: ####
DWG NAME: DRMS_COVER_INDEXMAPS.DWG

GROUNDWATER MONITORING WELLS

SHEET: 1

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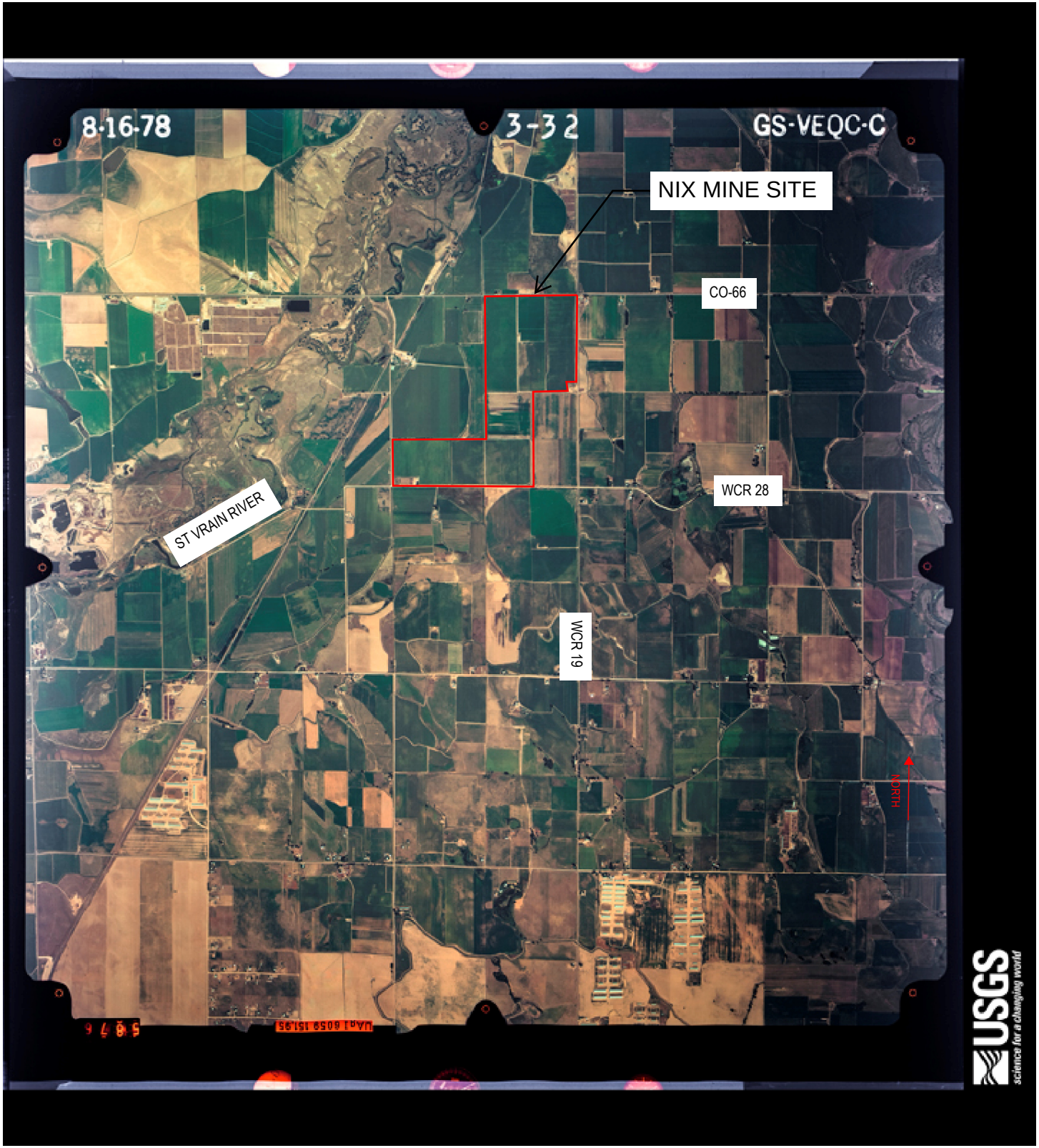
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3-32
GS-VEQC-C
NIX MINE SITE
CO-66
WCR 28
ST VRAIN RIVER
WCR 19
NORTH
USGS
science for a changing world

MEMORANDUM

TO: Steve Kelton (Brannan Sand and Gravel Company)

FROM: Chris Newton (DiNatale Water Consultants)

SUBJECT: Nix Site Groundwater Contamination Potential

DATE: March 31, 2023

The Nix Sand and Gravel Mine (Nix Site), permit M2001-046, is operated by Ready Mixed Concrete Company, LLC (RMCC). RMCC submitted Technical Revision 2 (TR2) to the Division of Reclamation, Mining and Safety (DRMS) on March 2, 2023. DRMS provided a letter, Adequacy Review 1, dated March 10, 2022, listing their concerns with the TR2 submittal. This memorandum provides an analysis of the hydrogeologic conditions present at the Nix Site and details the lack of significant impacts that the Nix Site is likely to have on groundwater quality in the area with respect to existing rules, regulations, and the permitting requirements at other nearby sites.

1. SITE DESCRIPTION AND GEOLOGY

The Nix Site will contain unlined ponds, the freshwater and overflow ponds, in Cell 1 and the remaining cells will be effectively separated from the groundwater system by the installation of slurry walls prior to mining operations (**Figure 1**). The Nix Site is adjacent to several other sand and gravel mining operations that demonstrate the resource potential of the area and the lack of any significant known impacts or concerns regarding water quality in the area.

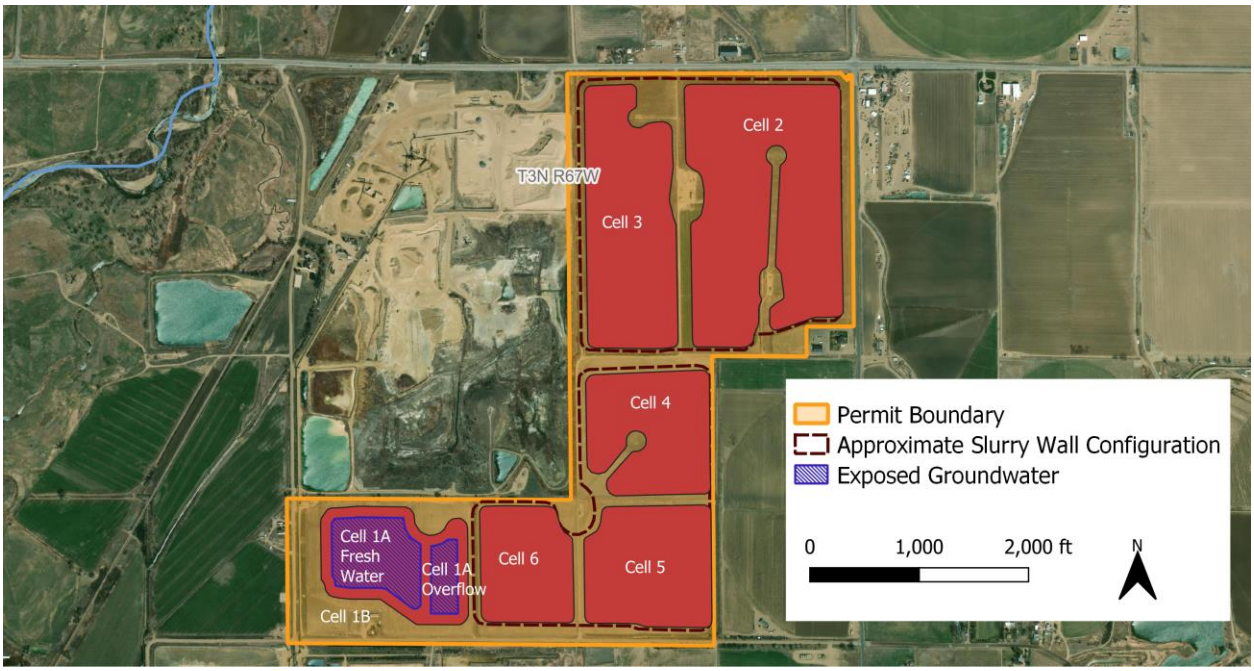

Figure 1. Nix Site locations showing unlined areas, slurry walls, and cell configurations

Across the site, there is approximately 5-15 feet of overburden, consisting of clayey to silty sand that overlies the sand and gravel deposits that will be extracted for construction materials. Keller and others (2019) shows that the sand and gravel deposits belong to Upper Pleistocene cut-in-fill terraces along St. Vrain Creek that may correlate with the Broadway and Louvers alluvium along the South Platte River. Exploratory drilling indicates that economic deposits generally consist of gravely, fine to coarse grained sand and sandy gravel with a fines content generally ranging from about 2-4 percent and some areas with lenticular clay beds. The sand and gravel deposits directly overlie the bedrock in the area, which generally consists of silty fine to medium grained sandstone with some local claystone seams, likely the upper transition member of the Upper Cretaceous Pierre Shale with potentially thinner areas of Upper Cretaceous Fox Hills Sandstone which conformably overlies the upper Pierre Shale member. Cross section B-B' from Keller and others runs through a mine site (Varra Companies Pit 115) approximately 2,000 feet south of the southern border of the Nix Site. This cross section is shown below as **Figure 2**.

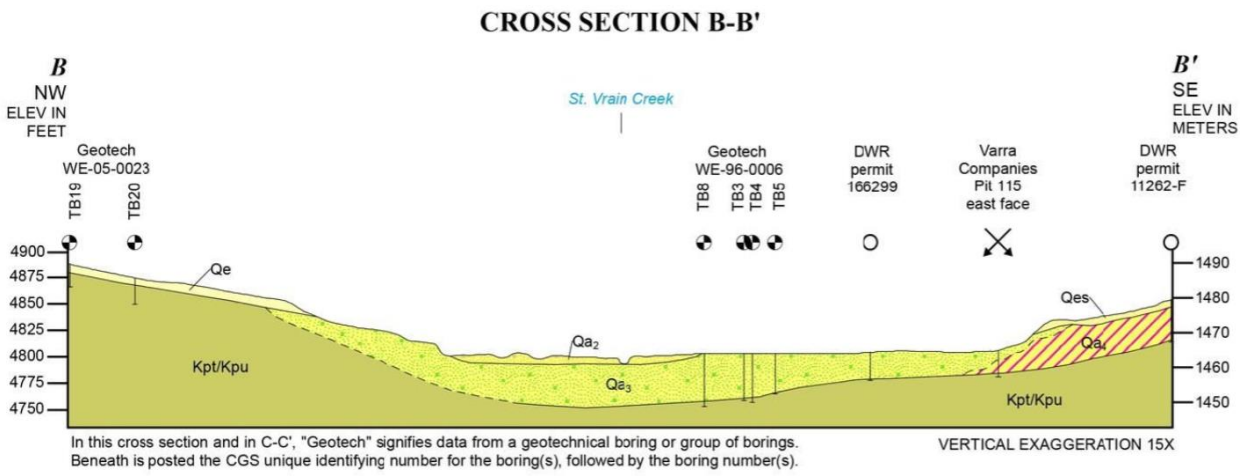

Figure 2. Cross section perpendicular to the St. Vrain Creek valley running south of the Nix Site (from Keller and others, 2019)

2. WATER QUALITY STANDARDS AND REGULATIONS

The controlling groundwater standards set by the Water Quality Control Commission (WQCC) in 5 CCR 1002-41 (Regulation 41) are the interim narrative standards described in paragraph 41.5(C)(6). These standards were developed and implemented to minimize the degradation of existing ambient groundwater quality. The Statement of Basis and Purpose for the original rulemaking, states: "*The narrative standards prohibit the introduction of non-natural chemicals where best available information indicates a potential threat to the public health, safety or welfare."* We believe that the best available information for the Nix Site do not indicate a potential threat to the public health, safety, or welfare.

The Nix Site is located outside of the areas of groundwater to which the WQCC has assigned use classifications and site-specific water quality standards. As the implementing agency for administering the interim narrative standards in Regulation 41, DRMS may apply reasonable permit conditions to ensure compliance with these standards.

The Colorado Mined Land Reclamation Board Rules and Regulations for the Extraction of Construction Materials (Construction Materials Rules) states that*: "…permit conditions shall be established for each operation that may have a reasonable potential to adversely affect the quality of a specified area that has not been classified by the WQCC. Such permit conditions may be in the form of numeric protection levels, practice-based permit conditions, or both."* It is not clear which parameters DRMS believes that operations at the Nix Site have a "reasonable potential" to introduce that will adversely impact water quality.

As per the memorandum of agreement (MOA) including the WQCC and DRMS regarding the implementation of SB 89-181, DRMS submits an annual report detailing their

implementation of water quality standards established by the WQCC. The 2022 annual report submitted by DRMS notes that, *"As of this reporting period, the Minerals Program requires approximately 31 mine sites to conduct some type of groundwater quality monitoring. Of these sites, 26 are hard rock mining operations, and 5 are construction material extraction operations."* Considering that hard rock mining operations have substantially greater potential to impact water quality, particularly with respect to water quality constituents that have more severe health concerns, it makes sense that DRMS has focused these monitoring requirements on hard rock mines. Of the five construction materials sites listed in the report, four sites involved extraction of limestone for cement production and only one site (permit no. M2017-036) involved sand and gravel extraction. It is important to note that the M2017-036 site is directly adjacent to denser residential, commercial, and industrial areas than the Nix Site and is also not directly adjacent to several other aggregate mine sites that are not subject to the same monitoring requirement.

3. GROUNDWATER FLOW AND CONTAMINATION POTENTIAL

Cell 1A will be unlined and used to supply water to the concrete plant to be located in the area of Cell 6. Cells 2-6 will be surrounded by low permeability slurry walls prior to mining operations in those cells. The slurry walls will be keyed into the underlying low permeability bedrock to effectively hydrologically isolate the area from the surrounding groundwater. By virtue of the slurry walls and low permeability bedrock, the potential for groundwater contamination by operations in these areas is minute. This means that any significant potential for contamination to the groundwater system would be based on the potential for contamination at the unlined ponds in Cell 1.

Based on RMCC's monitoring data collected from eight monitoring wells (**Figure 3**) near the permit boundaries, the direction of groundwater flow in the area is generally to the west-northwest with an average groundwater gradient across the site of approximately 0.004 to 0.005. Using a hydraulic gradient of 0.0045 and a hydraulic conductivity of 350 ft/day based on aquifer data in the Colorado Division of Water Resources Decision Support System (CDSS), the groundwater flux through the permit boundary is about 325,000 ft^3/day, which would act in-part to dilute any diffuse discharges of pollutants that could occur at the site. It should be noted that water levels in monitoring wells near the western and southern edges of the permit boundary are likely significantly affected by dewatering and/or cell lining occurring at the neighboring sites (DRMS Permit Nos. M1999-006 and M2015-033). Dewatering operations will make the water levels lower than the typical static water level absent the dewatering, while lining can tend to make water levels higher on the upgradient side of the liner. It seems apparent from data from Well MW5 that the depression in the water table from dewatering at the M2015-033 site coupled with the clay

lining and potential continued dewatering at the M1999-006 site may be controlling the direction of flow for a significant portion of the Nix Site.

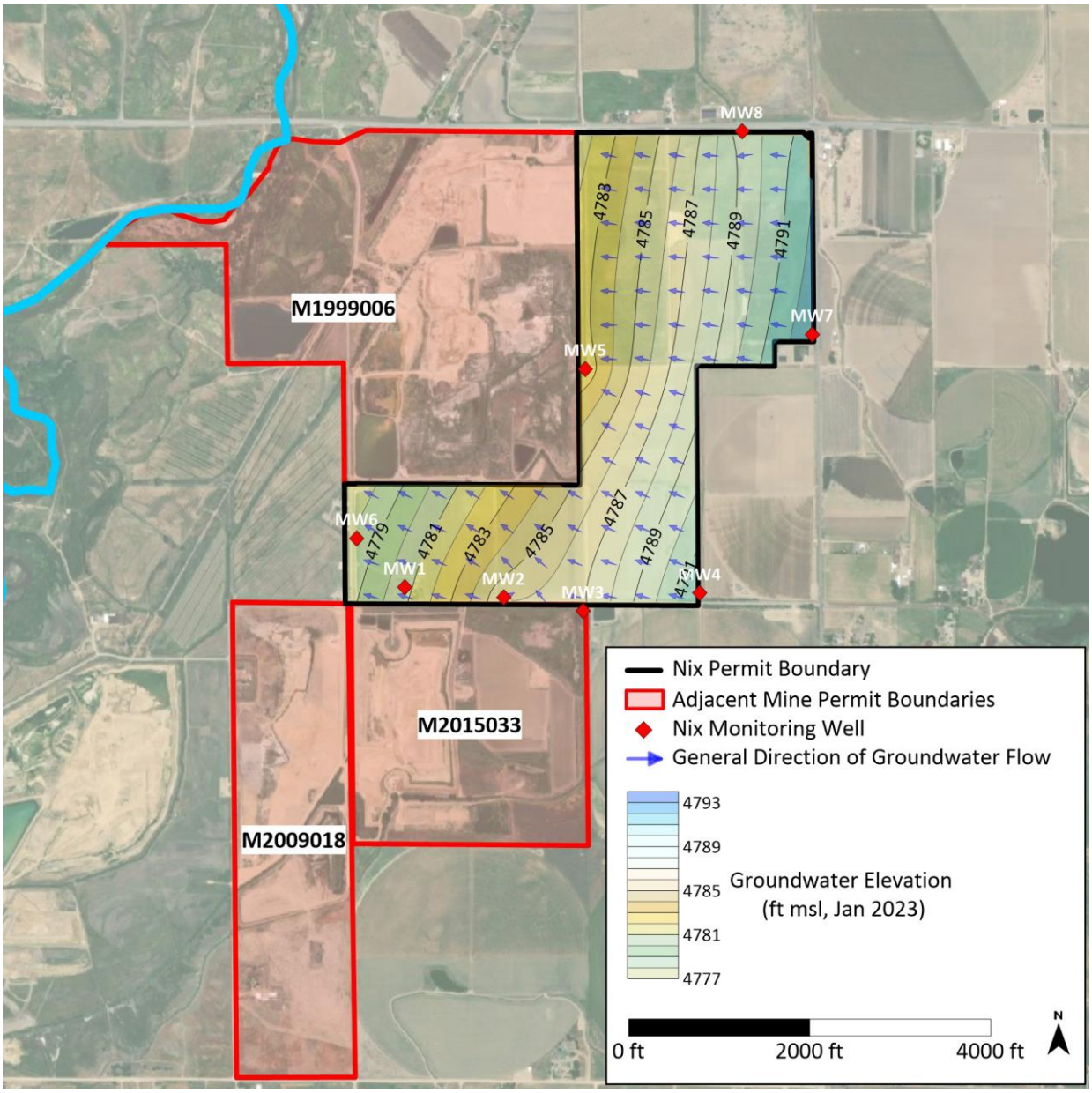

Figure 3. Nix groundwater levels, wells, and adjacent mine sites

The three adjacent mine sites operated by Raptor Materials LLC., DRMS Permit Nos. M1999-006, M2009-018 and M2015-033 (**Figure 3**), to our knowledge do not have permit requirements for monitoring groundwater quality and given the close proximity of these sites and the fact that they change the hydrologic regime of the area it does not seem that RMCC should be required to perform monitoring that is not required of the other sites. This is particularly true as dewatering and lining operations at the sites and at the Nix Site have the potential to change the groundwater flow paths such that any potential contaminants

mobilized from these sites could migrate toward the monitoring wells surrounding the Nix Site.

With respect to potential sources of contaminants, any stormwater discharges will be made under a NPDES discharge permit from CDPHE and the site will be operated in accordance with a stormwater management plan (SWMP) that will ensure limited impacts to water quality from stormwater discharge. Although no hazardous chemicals are used in the proposed site operations or processing, fuel or other fluids used in the mining equipment could be one potential source of chemical contaminates. These risks are inherent with any operation utilizing heavy equipment and fuel storage but are not enhanced at the Nix Site compared to other operations that do not require such groundwater monitoring. For example, the excavation to install a slurry wall around a site, or farming operations have similar potentials to introduce these contaminates but generally do not require strict monitoring of the groundwater in the area. Even though the risk of spill is small, the site will have a spill prevention, control, and countermeasure (SPCC) plan in effect at all times, ensuring that any potential spills are adequately addressed.

If contaminants were somehow introduced into Cell 1 it is unlikely they would be introduced in sufficient volumes to cause a potential threat to the public health, safety, or welfare, particularly given the lack of domestic, municipal, or agricultural use of the groundwater downgradient of the Nix Site. Utilizing the GIS database of well permits provided through CDSS, we looked at wells located in the vicinity of the Nix Site. For wells that potentially provide drinking water, we looked at wells with permitted uses including household use only, domestic, commercial, or municipal. For agricultural wells, we looked at wells with permitted uses of stock or irrigation. **Figure 4** shows that there are no wells that potentially provide drinking water located downgradient of the either the unlined pond areas or the proposed slurry walls. While **Figure 4** does show two agricultural wells downgradient, one well, located in the permit boundary of an adjacent mine site, is no longer used for irrigation and the other is a small stock watering well that is nearer to Saint Vrain Creek and relatively far downgradient of the Nix site. This stock watering well is also within the permit boundary of the M1999-006 site, although it does appear that the area is yet to be mined and any potential contamination from the Nix Site would be heavily diluted prior to reaching this well. The unlined portions of the M1999-006 mine site, which has no monitoring requirements, would have a significantly higher risk of impacting this well than would the Nix Site and the M2015-033 site would present similar concerns but also has no monitoring requirements. Additionally, because most of the area downgradient of the Nix Site is covered by current and future gravel pits or is within the floodplain of Saint Vrain Creek, future development of the groundwater in the area is likely to be limited.

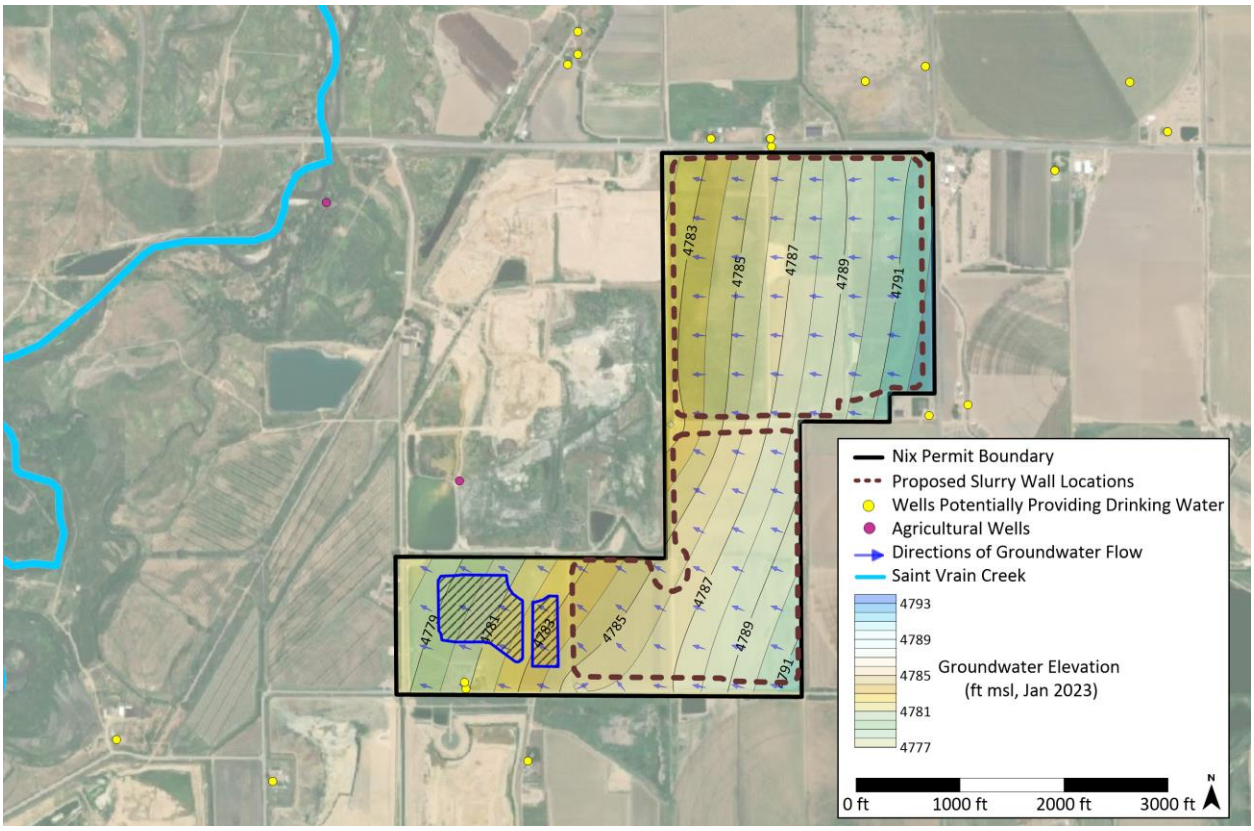

Figure 4. Groundwater wells located in the vicinity of the Nix Site

4. CONCLUSIONS

As supported by the lack of downgradient groundwater, installation of slurry walls around the majority of the mine cells, operational BMPs, and the fact that DRMS has not consistently required groundwater monitoring programs for other mine operators in the area, we do not believe that there is a "reasonable potential" for the Nix Site to adversely affect the groundwater quality. As such, we believe that the monitoring program, as proposed in RMCC's TR2 submittal provides adequate protection to prevent the degradation of groundwater quality from operations at the Nix Site and that specific numeric protection limits are not required given the existing practice-based permit conditions.

5. REFERENCES

Colorado Division of Water Resources. Various Dates. Colorado Decision Support System Well Permit/Applications GIS Database and Division 1 Groundwater Raster Dataset.

Division of Reclamation, Mining, and Safety. 2022. SB 89-181 Annual Report.

Keller, Stephen M., Lindsey, Kassandra O., and Morgan, Matthew L. 2019. Geologic map of the Gowanda quadrangle, Weld County, Colorado. Colorado Geological Survey Open-File Map 19-02.