Section 4 Ponds Area Environmental Report, Ambrosia Lake
Rio Algom Mining, LLC

McKinley County, New Mexico

Prepared for:

Rio Algom Mining, LLC

Prepared by:

INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS
6000 Uptown Boulevard NE, Suite 220
Albuquerque, New Mexico 87110

And

ERG
8809 Washington Street NE, Suite 150
Albuquerque, New Mexico 87113

August 16, 2018

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ALARA	"as low as is reasonably achievable"
BGEPA	Bald and Golden Eagle Protection Act
CFR	Code of Federal Regulation
DOE	U.S. Department of Energy
DP	Discharge Permit
ER	Environmental Report
ERG	Environmental Restoration Group, Inc
ft	Feet
FWS	U.S. Fish and Wildlife Service
°F	Degrees Fahrenheit
in.	Inch
INTERA	INTERA, Incorporated
KOMEX	KOMEX Environmental
LTSM	Long-Term Surveillance and Maintenance
Maxim	Maxim Technologies, Inc
MBTA	Migratory Bird Treaty Act
MMD	New Mexico Mine and Minerals Department
mph	Miles per hour
mrem/y	milli-roentgen equivalent man per year
NEPA	National Environmental Policy Act
NM	New Mexico
NMED	New Mexico Environment Department
NOAA	National Oceanic and Atmospheric Administration
NRC	U.S. Nuclear Regulatory Commission
NUREG	U.S. Nuclear Regulatory Commission Regulation
ORAU	Oak Ridge Associated Universities
ORISE	Oak Ridge Institute for Science and Education
RAML	Rio Algom Mining, LLC
SDP	Soil Decommissioning Plan
SHPO	State Historic Preservation Office
SWCA	SWCA Environmental Consultants

1.0 INTRODUCTION

On behalf of Rio Algom Mining, LLC (RAML), Environmental Restoration Group, Inc. (ERG) and INTERA Incorporated (INTERA) have developed this Environmental Report (ER) following the NUREG-1748 guidelines (NRC, 2003) to provide NRC the information and data required to support the decision-making process and to assess the environmental impacts of the proposed action. The proposed action is the release of the former Section 4 ponds area in accordance with chapter 10 Code of Federal Regulations (CFR) Part 40, Appendix A, Criterion 6(6). The former Section 4 ponds are located in Township 13 North, Range 9 West, Section 4, approximately 1 mile east of the RAML Ambrosia Lake Uranium Mill Facility (RAML Facility) and 25 miles from Grants on New Mexico Highway 509 (**Figure 1.1**).

The former Section 4 ponds consisted of a series of evaporation ponds associated with the RAML Facility, formerly the Kerr-McGee Mill (also referred to as the Quivira Mill). The former Section 4 ponds are licensed by the Nuclear Regulatory Commission (NRC) under Source Material License SUA-1473 (SUA-1473). The northern ponds, Ponds 11-15, were constructed in 1976 and the southern ponds, Ponds 16-21, were constructed in 1979 (**Figure 1.2**). The 255 acres of lined evaporation ponds were constructed in Section 4 to evaporate liquid effluents from the RAML Facility, including ion-exchange plant wastewater, process decant solutions, groundwater collected as part of the alluvial corrective action program, and other mill process solutions. The ponds were operational until April 2004 and pond reclamation began in late 2004 (RAML, 2006).

Over 3.5 million cubic yards of contaminated soil and sediment were relocated from the Section 4 ponds area to the main tailings disposal area at the RAML Facility from 2004 to 2014 (RAML, 2017b). After the liquids were evaporated, the Section 4 ponds sediment, liner material, berm material, and one foot of soil below the liner were removed from Section 4 and disposed of in Tailings Impoundment 2 at the RAML Facility (RAML, 2017b). Radiation surveys and soil sampling followed the initial removal of excavated material in 2008 and 2009. Oak Ridge Institute for Science and Education (ORISE) conducted confirmatory sampling in Section 4 for the NRC in 2009 (ORISE, 2010). RAML conducted additional investigation and removed an additional 85,000 cubic yards of material from the former Section 4 ponds area (RAML, 2017b). In 2015, Oak Ridge Associated Universities (ORAU) conducted additional confirmatory sampling and concluded that the Section 4 area did not meet the traditional soil cleanup levels defined in the *Soil Decommissioning Plan* (SDP) (ORAU, 2015; RAML, 2006).

In November 2017, RAML submitted a license amendment request for SUA-1473 which included an updated dose assessment to evaluate compliance with the radium benchmark dose

using the soil data collected by ORAU in 2015. The alternate method for evaluating compliance with cleanup requirements is described in the updated SDP submitted to NRC in 2017 with an alternate approach to determining the dose assessment (RAML, 2017b). The dose assessment of the former Section 4 ponds area was completed in 2017 by ERG and concluded that the modeled dose scenarios were below the radium benchmark dose of 18 milli-roentgen equivalent man per year (mrem/y) of Criterion 6(6) of 10 CFR 40, Appendix A and the current levels of radionuclides within the former Section 4 pond area are as low as reasonably achievable (ALARA) (RAML, 2017a; RAML, 2017b).

1.1 Purpose and Need for the Proposed Action

The need for the proposed action is to provide the NRC information to consider the release of the former Section 4 ponds area in accordance with Criterion 6(6) of Appendix A to 10 CFR 40. Such a release would remove former Section 4 ponds area from SUA-1473 and remove radiological regulatory controls from the property. This action would allow the area to be considered for future beneficial use by RAML, other industrial users, ranchers, or other entities.

1.2 The Proposed Action

The proposed action is a modification to RAML's Source Material License SUA-1473 for the release of the former Section 4 ponds area in accordance with Criterion 6(6) of Appendix A to 10 CFR 40. RAML has implemented operational procedures to verify that the former Section 4 ponds area meets the cleanup criteria described in the updated SDP (RAML, 2017b). The current radiological condition of the former Section 4 ponds area is ALARA and meets the alternative cleanup requirements in the revised SDP and as demonstrated in the *Final Radiological Condition and Dose Assessment for the Section 4 Ponds* report submitted in November 2017 (RAML, 2017a). Following release of the former Section 4 ponds area from SUA-1473, the area may be considered for future beneficial use.

1.3 Pertinent Statutes and Regulations

The RAML Facility, including the former Section 4 ponds, is licensed by the NRC under Source Material License SUA-1473. The RAML Facility is currently undergoing decommissioning pursuant to the SDP approved by NRC in 2006 and incorporated into SUA-1473 as condition 32 (RAML, 2006). The release of the former Section 4 ponds area is in accordance with 10 CFR 40, Appendix A, Criterion 6(6) as demonstrated in the *Final Radiological Condition and Dose Assessment for the Section 4 Ponds* (RAML, 2017a). The approach used to demonstrate the Section 4 dose assessment is ALARA and is described as the alternate approach in the SDP. The dose assessment approach includes calculating radiation dose for a hypothetical receptor located in the former Section 4 ponds area; the resulting dose is then compared to the radium benchmark

dose (RAML, 2017a). The doses modeled using the alternate approach are below the radium benchmark dose of 18 mrem/y.

While many other regulatory requirements (e.g., relevant environmental protection standards promulgated in 40 CFR and relevant occupational safety and health standards promulgated in 29 CFR) apply generally to the RAML Facility, the proposed action is a change in legal and regulatory status only to the requirements set forth by the NRC and applies only to the former Section 4 ponds area. The regulatory requirements for the remainder of the RAML Facility will remain unchanged under the proposed action.

RAML maintains active environmental permits, including mining permits issued by the New Mexico Mine and Minerals Department and groundwater discharge permits issued by the New Mexico Environment Department (NMED) Ground Water Quality Bureau. While NRC-related licensure requirements would change as a result of the proposed action, no change in State permitting would result from the proposed action. The remainder of the facility's regulatory requirements, including issues related to permitting, will remain unchanged under the proposed action.

Previous required consultations for work within the former Section 4 ponds area include the US Fish & Wildlife Service (FWS) and the NMED (NRC, 2005). Additionally, the New Mexico State Historic Preservation Division (NMHPD) has provided input concerning cultural resource sites within the former Section 4 ponds area (NRC, 2006).

2.0 ALTERNATIVES

The alternative to the proposed action of the release of the former Section 4 ponds area is the no-action alternative. The no-action alternative would leave the former Section 4 ponds area under the radiological regulatory controls of the License SUA-1473. The no-action alternative would not allow for the site to be released for other beneficial use. A release of the former Section 4 ponds area under Criterion 6(6) of Appendix A to 10 CFR 40 will make the property available for future beneficial use.

3.0 LAND USE

The RAML Facility is located approximately 20 miles due north of Grants in McKinley County, New Mexico (**Figure 1.1**). The Site is within the Ambrosia Lake mining district, which consists of approximately 100 mines that were active between approximately 1955 and 1995. The Ambrosia Lake mining district is rural and sparsely populated. The closest population center is the community of San Mateo, approximately 10 miles southeast of the site and the largest incorporated city in the region is Grants, New Mexico.

RAML performs an annual land use survey. According to the 2018 survey, land use within two miles of the Ambrosia Lake facility was limited to grazing land and utilities (RAML, 2018b).

Following a release of the former Section 4 ponds area in accordance with Criterion 6(6) of Appendix A to 10 CFR 40, the land use scenario will be a beneficial use consistent with the scenario described in the Section 4 ponds dose assessment (RAML, 2017a).

4.0 TRANSPORTATION

New Mexico State Highway 509 passes through Section 4 and is adjacent to the former Section 4 ponds area (**Figure 1.1**). Approximately 4 miles to the south of the facility, NM 509 terminates in NM 605, which connects San Mateo, NM to Milan, NM. Interstate 40 is approximately 15 miles south-southwest of the NM 509 and NM 605 intersection in Milan, NM (**Figure 1.1**). Previous National Environmental Policy Act (NEPA) documents have contemplated impacts to traffic due to short-term project work supporting closure of the former Section 4 ponds and concluded that some activities would result in increased traffic, particularly along NM 509, but that any increase in traffic would be bounded by historical traffic levels during the facility's full operational period (NRC, 2005 and NRC, 2006).

The proposed action contemplated within this ER, release of the former Section 4 ponds area from RAML's radioactive materials license, is a change in legal status involving no change in site activity and will not affect traffic on NM 509.

5.0 GEOLOGY AND SOILS

5.1 Geology

The geology of the Ambrosia Lake area has been described by numerous authors (Stone et al., 1983; Bostick, 1985; Kernodle, 1996). The sedimentary formations of interest in the Ambrosia Lake area are of upper Jurassic to Cretaceous age and include the Morrison Formation, the Dakota Sandstone, and the Mancos Shale. Quaternary alluvium fills in much of the valley (**Figure 5.1**).

The alluvium occurs over much of the Ambrosia Lake Valley. It is composed primarily of Mancos Shale-derived sediments, producing soils ranging from clayey sands to sandy clays. The alluvium is stratified and contains occasional basal gravels (Bostick, 1985). The thickness of the alluvium ranges from 0 feet (ft) near outcrops to 70 ft thick in the center of the valley. A paleochannel occurs within the alluvium in the center of the valley, striking roughly parallel to the modern Arroyo del Puerto (Maxim, 2001).

The Westwater Canyon and the Brushy Basin Member are the two uppermost members of the Morrison Formation (**Figure 5.2**). The Westwater Canyon is present throughout the San Juan Basin at thicknesses that range from about 50 ft in the southeast corner of the basin to about 300 ft in the southwest-central part of the basin; in the Ambrosia Lake area, the Westwater Canyon thickness is roughly 200 ft. It consists of locally conglomeratic sandstone interbedded with sandstone, shale, and claystone; the proportion of sandstone and the grain size of the sandstones decrease toward the northeast. The Westwater Canyon is the uranium-ore-bearing unit in Ambrosia Lake area (McLemore et al., 2005; McLemore, 2007). The Westwater Canyon is underlain by the Recapture Member of the Morrison Formation, which is a shaley unit and is considered an impermeable lower boundary to groundwater flow in the Westwater Canyon and shallower sandstone units. The Brushy Basin Member consists mainly of calcareous and bentonitic claystone and mudstone and functions as an aquitard throughout the basin. It is generally 100 to 200 ft thick in the Ambrosia Lake area.

The Dakota Sandstone overlies the Westwater Canyon throughout the San Juan Basin. It consists of a basal section of sandstone and conglomeratic sandstone overlain by a middle section of siltstone, shale, and lenticular sandstone beds, and an upper section of fine-grained sandstone interbedded with shale. The Dakota Sandstone ranges from 10 to about 500 ft thick and is commonly 200 to 300 ft thick. Its thickness in the Ambrosia Lake area is generally 100 to 300 ft thick.

The main body of the Mancos Shale is present above the Dakota Sandstone throughout the San Juan Basin. In the northern part of the basin, the main body of the Mancos Shale is up to 2,300 ft

in thickness. The aggregate thickness of the Mancos Shale tongues in the southern part of the basin is about 1,000 ft. The main body of the Mancos Shale is generally 500 to 800 ft thick in the Ambrosia Lake area. Three sandstone beds are found near the bottom of the Mancos Shale, termed the Tres Hermanos (Bostick, 1985). From highest to lowest the three sandstone beds are referred to as Tres Hermanos C, Tres Hermanos B, and Tres Hermanos A. They are thin (<10 ft), fine-grained sandstones and do not yield much water.

5.2 Soils

The former Section 4 ponds area are a disturbed portion of the RAML Facility and reclamation activities removed over 3.5 million cubic yards of contaminated soil and sediment. Much of Section 4 is covered by what is classified as "Uranium mined lands (265)" by the NRCS soil survey of McKinley County Area and shown on **Figure 5.3** (NRCS, 2001).

The northwest quarter and a portion of the southeast corner are covered by Hagerwest and Bond type soils (220) on slopes of approximately 1 to 8 percent (**Figure 5.3**). These soils are composed of roughly 50 percent Hagerwest soils, 35 percent Bond soils, and 15 percent other minor components. Depth to bedrock for Hagerwest soils in this area ranges from 20 to 40 inches and ranges from 10 to 20 inches thick for Bond soils. These soils are composed of fine sandy loam, sandy loam, and sandy clay loam and are well drained. The topsoil suitability is rated "poor" to "fair" due to shallow depth to bedrock and the presence of rock fragments.

A portion of the east side and southwest corner of Section 4 is covered by Sparank - San Mateo - Zia Complex (230) (**Figure 5.3**). These soils are on slopes of approximately 0 to 3 percent and are composed of roughly 40 percent Sparank soils, 35 percent San Mateo soils, 20 percent Zia soils, and 5 percent other minor components. Depth to bedrock, Mancos Shale or Tres Hermanos sandstone, is generally more than 60 inches and the soils are composed of silty clay loam, clay loam, and sandy loam. These soils are well drained to excessively well drained. The topsoil suitability is rated "poor" to "fair" due to high sodium and/or clay content.

A small corner of the northwest corner of Section 4 is covered by Penistaja - Tintero Complex (205) on 1 to 10 percent slopes (**Figure 5.3**). These soils are composed of roughly 45 percent Penistaja, 40 percent Tintero, and 15 percent other minor components. Depth to bedrock is generally 60 inches, Mancos Shale or Tres Hermanos sandstone. These soils are well drained to excessively well drained and the topsoil suitability is rated as "good".

In general, the soils of Section 4 are composed predominantly of silty sands and sandy to silty clays. Petrologic analysis indicates that they contain abundant clay, quartz, and chalcedony in limonite and calcite cement (RAML, 2001). Presence of abundant iron oxyhydroxides (limonite)

and calcite give these soils a high capacity to attenuate metals and radionuclides (i.e. remove these constituents from infiltrating water).

The proposed action contemplated within this ER, release of the former Section 4 ponds area from RAML's radioactive materials license, is a change in legal status involving no change to geology or soils.

6.0 WATER RESOURCES

For over 30 years, uranium ore was extracted from the host sandstones of the Westwater Canyon member of the Morrison Formation, the principal ore-bearing zone in the Ambrosia Lake area. Development of uranium from subsurface mines that were excavated in the Westwater Canyon necessitated continuous dewatering during mining operations. As a result, mining could not proceed without production of large quantities of water being pumped and discharged to the surface (Stone et al., 1983). The former Section 4 ponds area was impacted from mine-related water discharges flowing on the surface and through the alluvium.

6.1 Surface Water

There are no natural perennial streams or other surface water bodies in the Ambrosia Lake Valley, including the former Section 4 pond area. The principal drainage channel for the Ambrosia Lake area is the Arroyo del Puerto, which is a tributary of San Mateo Creek and is near the southwest corner of Section 4 (**Figure 6.1**). Arroyo del Puerto is classified as an intermittent stream and flows from the northwest to the southeast through the valley (**Figure 6.1**). Intermittent streams flow for only a part of the year in response to heavy storms or periods of prolonged snow melt while ephemeral drainages flow only after exceptionally heavy storms and may not have surface flow for many years. **Figure 6.1** shows an ephemeral drainage is present in the southeast corner of Section 4.

Water discharge from mine dewatering and mining operations throughout Ambrosia Lake Valley resulted in surface water flow in portions of Arroyo del Puerto and other ephemeral drainages in the area, including Section 4 (DOE, 1990). Historical surface water in Section 4 associated with mining and milling activities included:

- Surface discharges of mine-related water to the ephemeral drainage prior to pond construction and
- Permitted discharge to the former Section 4 ponds.

Berms and a diversion channel were constructed around the Section 4 ponds to divert any surface water that might flow through the ephemeral drainage in Section 4 around the pond area (RAML, 2004b). The discharge into the lined Section 4 ponds was approved by the New Mexico Environment Department (NMED) on August 7, 1979 under Discharge Permit 71 (DP-71). On April 23, 2012, NMED approved incorporating all continuing monitoring requirements remaining under DP-71 into DP-362, which applies to all RAML mines and the mill facility (NMED, 2012).

The proposed action contemplated in this ER, release of the former Section 4 ponds area, will not affect the surface water in the area since the ephemeral drainage in the southeast corner of the Section does not run through the former Section 4 ponds area. In addition, the ephemeral drainage rarely has surface water and only flows in response to exceptionally heavy rainfall.

6.2 Groundwater

Groundwater in the Ambrosia Lake area is found in the alluvium, the Tres Hermanos sandstones of the lower Mancos Shale, the Dakota Sandstone, and the Westwater Canyon (**Figure 5.2**). Regional groundwater flow is generally towards the northeast. However, mine dewatering in the Westwater Canyon has modified the hydraulic gradient by forming a cone of depression in the Ambrosia Lake area (INTERA, 2018b). A cone of depression has also formed in the Dakota Sandstone, due to downward drainage into mine shafts, ventholes, and leach holes that penetrate to the Westwater Canyon from the ground surface. **Figure 6.2** illustrates a conceptual model of this process. Water levels began to recover following the end of mining and mine dewatering in the 1980s; however, pumping of the Westwater Canyon continued in certain locations until 2006, as part of in-situ leaching operations and the groundwater Corrective Action Plan in the Mill area (AVM and AHA, 2000). Groundwater flow in the Tres Hermanos sandstones is limited. Saturated conditions in these units is predominantly due to mine dewatering-related surface discharge and seepage from the tailings. Groundwater flow is diminishing, and is expected to continue to diminish, due to downward drainage along shafts, ventholes, and leach holes.

Groundwater in the alluvium was historically non-existent due to limited natural recharge to this unit (INTERA, 2017). Historically, groundwater found within the alluvium was from mining-related discharge of water at the ground surface and seepage from the tailings pile. In the Section 4 area, saturated alluvium remains only in the most downgradient wells in the southwest portion of the Section (**Figure 6.3**). DP-71 required installation of monitoring wells in and around Section 4 to monitor water levels in the alluvium. These wells are monitored annually and were dry or did not contain enough water to collect a sample during the 2017 annual monitoring event (INTERA, 2018a). The monitoring wells associated with DP-71 have had insufficient water for sampling since 2014 (INTERA, 2017) (**Figure 6.3**). Alluvial groundwater level data demonstrate that impacts to soil and the presence of groundwater beneath the lined Section 4 Ponds occurred prior to pond construction as a result of mine-related water discharges (RAML, 2008).

Natural inflows to the alluvium are from direct recharge, primarily during heavy rainfall and surface water flows in arroyos and ephemeral washes. The amount of recharge to the alluvium is limited due to the intermittent nature of rainfall in the area and the low permeability of the alluvium. Recharge to the underlying bedrock units would be along sparse rock outcrop in the northwest corner of Section 4 and south of Section 4 (**Figure 5.1**). The Tres Hermanos

sandstones are relatively thin and embedded in the Mancos Shale (**Figure 5.2**). Therefore, natural recharge to outcrops of these units is expected to be very small.

Since there is minimal, to no, groundwater in the alluvium below the former Section 4 ponds area the groundwater does not pose a threat to the surrounding area if the Site is released from RAML's radioactive material license.

7.0 ECOLOGY

The former Section 4 ponds are a disturbed portion of the RAML Facility. Previous NEPA documents note that no habitat for the listed species at the time of each assessment was identified in the area (NRC, 2006). By letter dated September 01, 2015, the FWS transmitted the Federal list of potential threatened and endangered species for the Ambrosia Lake Mill area within McKinley County, New Mexico (FWS, 2015). According to FWS, a total of 5 threatened or endangered species may be found within the Section 4 area. No critical habitats are found within Section 4.

The Mexican Spotted owl (*Strix occidentalis lucida*) and the Yellow-Billed Cuckoo (*Coccyzus americanus*) are listed as threatened bird species and the Southwestern Willow Flycatcher (*Empidonax traillii extimus*) is listed as an endangered bird species that may be found within the Section 4 area. The Zuni Bluehead Sucker (*Catostomus discobolus yarrowi*) is listed as an endangered fish species within the surrounding area. The Zuni fleabane (*Erigeron rhizomatus*) is listed as a threatened flowering plant that may be found within the area. Although the bald eagle was delisted on August 9, 2007, both the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) are still protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) which protect both eagles from unlawful disturbance.

SWCA Environmental Consultants (SWCA) conducted a threatened and endangered species habitat survey in September 2015 of the RAML Facility and surrounding area, including the former Section 4 ponds area. No special-status species, endangered or threatened, were observed during the survey (SWCA, 2015). In addition, the special-status species were determined not to have the potential to occur and no suitable habitat was observed in the area (SWCA, 2015). No bald or golden eagles were observed during the biological survey (SWCA, 2015).

The habitat of the former Section 4 ponds area has been disturbed by construction and reclamation of the Section 4 ponds. In addition, the region has documented degradation which has reduced productivity and species diversity in the area (NRC, 2010). The action proposed within this ER will not change the impact to habitat since the release of the former Section 4 ponds area is a change in legal status.

8.0 METEOROLOGY, CLIMATE, AND AIR QUALITY

8.1 Meteorology and Climate

The Ambrosia Lake Valley has a cool semiarid climate characterized by low precipitation, abundant sunshine, low relative humidity, and a relatively large diurnal temperature range. **Table 8.1** presents a summary of climate data collected at the Grants airport.

Table 8.1 Climate Summary for Grants, NM

	Mean Temperature (°F)	Mean Max Temperature (°F)	Mean Min Temperature (°F)	Mean Precip (in.)	Mean wind speed (mph)	Mean Snowfall (in.)
Jan	31.0	46.9	15.2	0.41	7.7	2.7
Feb	34.5	50.7	18.3	0.36	8.5	1.9
Mar	40.5	58.2	22.8	0.56	9.1	0.4
Apr	47.8	66.1	29.4	0.33	10.4	0.3
May	57.1	76.7	37.4	0.25	9.6	0
Jun	66.1	86.1	46.1	0.45	9.3	0
Jul	71.1	88.0	54.2	1.40	7.7	0
Aug	68.4	84.7	52.1	1.65	6.9	0
Sept	61.5	79.2	43.7	0.94	7.5	0
Oct	50.1	68.1	32.0	0.94	8.1	0.5
Nov	38.7	56.3	21.1	0.59	7.8	0.7
Dec	29.3	45.5	13.1	0.58	7.6	2.9
Year	49.7	67.2	32.1	8.44	8.3	9.4

Note: Temperature and wind data are for November 1997 to December 2008, the most recent observational period for which data is available. Snowfall totals are for National Oceanic and Atmospheric Administration's (NOAA's) 1971-2000 observational period.

°F = degrees Fahrenheit

in. = inches

mph = miles per hour

Sources: Western Regional Climate Center, NOAA

The NMED previously operated a meteorological station three miles northeast of Section 4. The station operated for an 11-month period during 1976-77. The data collected by the weather station are available as Appendix A to RAML's Closure Plan Lined Evaporation Ponds (RAML, 2004b). The general trend in temperature and precipitation data from NMED's station is consistent with data collected at the Grants airport, although NMED's weather station measurements are consistently 3-5 °F cooler. NMED's meteorological station did not measure precipitation; precipitation data from nearby communities (e.g., San Mateo, Marquez, and San Fidel) suggests that mean precipitation is quite variable on a hyperlocal basis (with up to 30

percent difference between observation location), likely due fluctuations in topography and elevation (RAML, 2004b).

8.2 Air Quality

RAML currently monitors radon gas at the air monitoring stations shown on **Figure 8.1**. Air monitoring stations KGL South and KGL North are located nearest to the former Section 4 ponds area and were installed to support the Section 4 ponds closure project (RAML, 2004b). These monitoring locations are part of the RAML facility's existing monitoring program and the locations will not change as a result of the proposed action. In 2016, RAML requested authorization from the NRC to cease components of the environmental monitoring program, including particulate monitoring for mill-related radionuclides (thorium-230, radium-226, lead-210, and uranium-nat) (RAML, 2016). In 2017, the NRC concurred with the cessation of environmental monitoring at RAML, except for the monitoring of radon gas, for which the NRC required continued monitoring (NRC, 2017). Risk assessment (RAML, 2017a) has demonstrated that radiation doses to the public from the airborne emission of radionuclides from the former section 4 ponds are as low as reasonably achievable.

The proposed action is only a change in legal status, therefore it will not change emissions from the former Section 4 ponds area, nor affect the measured values at the facility's air monitoring locations.

9.0 NOISE

The release of Section 4 from SUA-1473 will not result in any change in noise impacts from the Site. Previously contemplated project activities within the former Section 4 ponds area (e.g., the closure of the ponds in the mid-2000s) caused minimal noise impacts due to construction, site activities, and traffic on nearby State Highway NM 509 (RAML, 2004a and NRC, 2005).

The proposed action contemplated by this ER, the release of the former Section 4 ponds area from RAML's radioactive materials license, is a change in legal status involving no change in site activity, and therefore no change in noise impacts.

10.0 HISTORICAL AND CULTURAL RESOURCES

RAML takes measures to appropriately manage its cultural and historical resources within the vicinity of the former Section 4 ponds area and throughout Ambrosia Lake valley.

The former Section 4 ponds are a disturbed portion of the RAML Facility. Previous NEPA documents note that there are no discernable cultural resources within the former Section 4 ponds area (NRC, 2005, NRC, 2007, NRC, 2010). A 2006 environmental assessment conducted in support of RAML's SDP notes that cultural resource surveys conducted in 1990 identified two recordable cultural sites in undisturbed locations on 97 surveyed acres north and east of the former Section 4 ponds area (NRC, 2006). Related to this finding, in 2005 RAML submitted a Data Recovery Plan to the New Mexico State Historic Preservation Office describing how the identified archaeological sites would be managed during soil decommissioning activities. The Data Recovery Plan is included as Attachment A to RAML's SDP (RAML, 2006).

The proposed action contemplated within this ER, the release of the former Section 4 ponds area from RAML's radioactive materials license, is a change in legal status involving no change in site activity and will not change the impact to cultural or historical resources within the former Section 4 ponds area.

11.0 VISUAL AND SCENIC RESOURCES

The proposed action, the release of the former Section 4 ponds area from SUA-1473, contemplated by this ER is a change in legal status involving no change in site activity and therefore will not change the impacts to visual and scenic resources.

12.0 SOCIOECONOMIC

The closest population center to the former Section 4 ponds site is San Mateo, New Mexico, which is approximately 10 miles southeast of the site. Milan, approximately 17 miles south of the site and Grants, approximately 20 miles south of the site and approximately 3 miles southeast of Milan, are the next closest population centers (**Figure 1.1**). According to the U.S. Census Bureau, the 2010 population of San Mateo was 161, Milan was 3,245, and Grants was 9,182 (Census Bureau, 2010).

The median age in San Mateo in 2010 was 49.9 years and approximately 19.9 percent of the population is under 18 years old. Approximately 38.3 percent of the population 16 years old or older was in the workforce and the mean household income was $69,177. Approximately 12.5 percent of the population was below the poverty level (Census Bureau, 2010). Approximately 95.6 percent of the population of San Mateo identified as a minority according to the definition provided in Appendix C of NUREG-1748 (NRC, 2003).

From 2000 to 2010, the population of Milan grew 71.6 percent, from 1,891 in 2000 to 3,245 in 2010. The median age in Milan in 2010 was 35.8 years and approximately 18.4 percent of the population is under 18 years old. Approximately 59.5 percent of the population 16 years old or older was in the workforce and the median household income was $35,877. Approximately 32.5 percent of the population was below the poverty level. Approximately 84.7 percent of the population of Milan identified as a minority (Census Bureau, 2010).

From 2000 to 2010, the population of Grants grew 4.3 percent, from 8,806 in 2000 to 9,182 in 2010. The median age in Grants in 2010 was 35.7 years and approximately 25.9 percent of the population was under 18 years old. Approximately 51 percent of the population 16 years old or older was in the workforce and the median household income was $39,923. Approximately 23.5 percent of the population was below the poverty level and approximately 76 percent of the population of Grants identified as a minority (Census Bureau, 2010).

McKinley County, in which the Site is located, had a population of 71,492 in 2010. Approximately 33.4 percent of the county population was below the poverty line and approximately 93.2 percent of the population of McKinley County identified as a minority. The communities of Milan and Grants are in Cibola County, south of the Site. In 2010, Cibola County had a population of 27,213. Approximately 24.0 percent of the county population was below the poverty and approximately 82.2 percent identified as a minority (Census Bureau, 2010).

In 2010 the population of New Mexico was 2,059,179. Approximately 18.4 percent of the state population was below the poverty line and approximately 63.0 percent identified as a minority (Census Bureau, 2010).

The proposed action, the release of the former Section 4 ponds area from SUA-1473, contemplated by this ER is a change in legal status involving no change in site activity and therefore no significant change to the surrounding population characteristics.

13.0 ENVIRONMENTAL JUSTICE

The communities of San Mateo, Milan, and Grants are not within a four-mile radius, the required radius for assessment in a rural area defined by Appendix of NUREG-1748, of the former Section 4 ponds area (**Figure 13.1**). The Site is located within McKinley County. The poverty level in McKinley County is higher than the poverty level in New Mexico; however, it is less than 20 percentage points greater and therefore not significantly greater, as defined in Appendix C of NUREG-1478 (NRC, 2003). The minority population of McKinley County is significantly greater (more than 20 percentage points) than the minority population of New Mexico (**Table 13.1**).

Table 13.1. Summary of Population Below Poverty Level and Minority Population

			Minority Population					
	Population Below Poverty Level (%)	Total Minority Population (%)	Black or African American (%)	American Indian or Alaska Native (%)	Asian (%)	Native Hawaiian or Other Pacific Islander (%)	Hispanic or Latino (%)	White and a Minority Race (%)
San Mateo	12.5	95.6	2.5	4.3	0.0	0.0	85.7	3.1
Milan	32.5	84.7	1.4	13.0	0.6	0.0	67.1	2.6
Grants	23.5	76	1.7	16.9	0.8	0.2	52.1	4.3
McKinley County	33.4	93.2	0.5	75.5	0.8	0.0	13.3	3.1
Cibola County	24.0	82.2	1.0	41.0	0.5	0.1	36.5	3.1
New Mexico	18.4	63.0	2.1	9.4	1.4	0.1	46.3	3.7

Data from U.S. Census Bureau, 2010
% = percent

There are no occupancies, ranches, or homes, within a two-mile radius of the former Section 4 ponds area and therefore no direct impacts to any population group. Within a four-mile radius of Section 4 there are eight ranches: one ranch is located approximately 3.75 miles north, one ranch is approximately 3.8 miles southwest, one ranch is approximately 3.4 miles southeast, and five ranches are between two and three miles south of Section 4 (**Figure 13.1**).

The proposed action, the release of the former Section 4 ponds area from SUA-1473, contemplated by this ER is a change in legal status involving no change in site activity.

14.0 PUBLIC AND OCCUPATIONAL HEALTH

14.1 Public Health

As part of its annual ALARA report, RAML calculates radiation doses to members of the public, as required by 10 CFR 20.1301-1302 and 40 CFR 190.10. Historical environmental monitoring data collected at facility monitoring stations shows that radon gas is the most significant potential pathway for public exposure from the Ambrosia Lake facility. The largest public exposure, per the 2017 ALARA report - the most recent year available - was 3.2 mrem to the nearest resident, assumed to be located at the Section 17VH4 monitoring location (see **Figure 8.1**) (RAML, 2018a).

The proposed action would release the Section 4 ponds from SUA-1473. While RAML will maintain legal control of the Section 4 ponds area under the proposed action, it is conceivable that members of the public would be exposed to residual radioactive material in the soils of the former Section 4 ponds area. The radiation dose resulting from the hypothetical exposure of a member of the public to residual radioactive materials within the former Section 4 ponds area is evaluated in *Final Radiological Condition and Dose Assessment for the Section 4 Ponds Rio Algom Mining Ambrosia Lake Facility* (RAML, 2017a) and discussed in detail in Section 1.0 of this document. The dose assessment concluded that the modeled dose scenarios were below the radium benchmark dose of 18 mrem/y of Criterion 6(6) of 10 CFR 40, Appendix A and that the current levels of radionuclides within the former Section 4 Pond area are as low as reasonably achievable (ALARA) (RAML, 2017a).

14.2 Occupational Health

RAML maintains an occupational health program that primarily manages two hazards, both of which represent relatively low absolute risks to RAML's worker population: physical hazards and radiological hazards. There is also a smaller biological hazard, due to the presence of rattlesnakes, for example, at the Ambrosia Lake facility. Project-specific hazards are identified using a job risk assessment, and any unacceptable risk is mitigated via controls commensurate with the absolute risk a hazard represents. RAML's process to manage occupational hazards is described in procedure PET-HSE27-HH-PRD-00004 *Occupational Exposure Management* (BHP Billiton, 2018).

Physical hazards for workers at RAML include slips, trips, and falls as well as traffic hazards. RAML's occupational radiation protection program is conducted according to the requirements set out in the CFR Title 10, Part 40 Standards for Protection Against Radiation. A summary of the occupational radiation protection program at RAML ("ALARA report") describing licensed activities and occupational monitoring results is prepared annually. The 2017 ALARA report is the most recent available (RAML, 2018a).

In 2017, 23 employees were monitored for both deep and shallow radiation dose. The mean annual deep tissue dose equivalent was less than 1 mrem, with 0% of the monitored population exposed above the minimum measurable dose. The mean annual shallow dose equivalent was less than 1 mrem, with 0% of the monitored population exposed above the minimum measurable dose.

Due to the nature of site activities, no breathing zone monitoring was conducted during 2017. Previous breathing zone monitoring in 2015 and 2016 demonstrated that internal doses due to uptake of long-lived radionuclides were very low (less than 10% of applicable limits) and therefore monitoring is not required. No bioassay samples were collected during 2017.

Contamination surveys are required for personnel exiting the long-term surveillance and monitoring (LTSM) area of the Ambrosia Lake facility. None of the contamination surveys conducted in 2017 exceeded the Site's action level of 100 cpm above background.

Annual radiation safety training, as required by the Radiation Protection and Environmental Program Manual, was completed for all employees in 2017. The Radiation Safety Officer conducted an internal audit of the radiation protection program in June 2017. No deficiencies were identified.

The Site's health, safety and environment systems provide adequate assurance that hazards at the Ambrosia Lake facility are being appropriately managed, and that both the public and employees are adequately protected from facility-related risks. Because the risk resulting from facility-related exposures at or near the Ambrosia Lake facility is very low, and because the proposed action is purely a change in the NRC license status of the affected areas, the proposed action contemplated within this ER will not change Site activity and will not result in a change to the occupational health program.

15.0 WASTE MANAGEMENT

RAML takes measures to appropriately manage all generated wastes within the vicinity of the former Section 4 ponds area and sitewide. RAML's waste management practices are documented in procedure PET-HSE27-EN-PRD-00012, Waste Management (BHP Billiton, 2016).

The proposed action, the release of the former Section 4 ponds area from RAML's radioactive materials license under Criterion 6(6) of Appendix A to 10 CFR 40, is a change in the legal status of the associated land with implications for how future wastes generated from the area are managed. Since there is no industrial infrastructure in the former Section 4 ponds area any waste generated from the area would consist of soil and vegetative material. Currently, personal property (e.g., soil) from Section 4 must either be surveyed to demonstrate compliance with the criteria given in 10 CFR 40 Appendix A 6(6) or must be disposed as 11.e.(2) byproduct material. NRC must review and approve any release occurring under 10 CFR 40 Appendix A 6(6).

The proposed action would discontinue the need for NRC oversight of material removed from the former Section 4 ponds area: such material would no longer need to be surveyed or managed as regulated waste. The impact from the change in waste regulatory status is minimal, as RAML has previously demonstrated compliance with NRC's decommissioning criteria (RAML, 2017a), which includes risk assessment to show that future radiation doses are as low as reasonably achievable.

16.0 REFERENCES

AVM Environmental Services and Applied Hydrology Associates (AVM and AHA), 2000. Groundwater Corrective Action Program and Alternate Concentration Limits Petition, Uppermost Bedrock Units. Prepared for Quivira Mining Company. February 15, 2000.

BHP Billiton, 2016. Waste Management. Procedure PET-HSE27-EN-PRD-00012. November 1, 2016.

_____, 2018. Occupational Exposure Management. Procedure PET-HSE27-HH-PRD-00004. February 1, 2018.

Bostick, K., 1985. Ground-Water Discharge Plan Analysis for Kerr-McGee Nuclear Corporation.

Department of Energy (DOE) United States. 1990. Remedial Action Plan and Site Conceptual Design for the Stabilization of the Inactive Uranium Mill Tailings Site at Ambrosia Lake, New Mexico. Final. UMTRA-DOA/AL-650516.0000, September 1990. Transmitted by DOE letter dated September 25, 1990.

Fish and Wildlife Service (FWS) United States, 2015. List of Threatened and Endangered Species That May Occur in Your Proposed Project Location, and/or May Be Affected by Your Project, Ambrosia Lake Mill MSGP. Letter from FWS, New Mexico Ecological Services Field Office, September 01, 2015.

INTERA Incorporated (INTERA), 2017. DP-362 Data Summary Report, Rio Algom Mining, LLC, McKinley County, New Mexico, Submitted to NMED, January 31, 2017.

_____, 2018a. Rio Algom Mining, LLC, Ambrosia Lake Facility Discharge Permit 362 (DP-362) Semiannual Groundwater Monitoring Report, Second Half 2017, Submitted to NMED, January 23, 2018.

_____, 2018b. Groundwater Modeling for Closure of Old Stope Leaching Operations, Ambrosia Lake Facility, McKinley County, New Mexico, 2018 Model Update. Submitted to NMED, May 10, 2018.

Kernodle, J. M., 1996. Hydrogeology and Steady-State Simulation of Ground-Water Flow in the San Juan Basin, New Mexico, Colorado, Arizona, and Utah: U.S. Geological Survey Water-Resources Investigations Report 95-4187.

Maxim Technologies, Inc. (Maxim), 2001. Application for Alternate Concentration Limits for the Alluvial Materials Quivira Mill Facility Ambrosia Lake, New Mexico. May 2001.

McLemore, V.T., Hoffman, G., Smith, M., Mansell, M., and Wilks, M., 2005. Mining districts of New Mexico: New Mexico Bureau of Geology and Mineral Resources, Open-file Report 494, CD-ROM.

McLemore, V.T., 2007. Uranium resources in New Mexico: Society of Mining, Metallurgy, and Exploration (SME) preprint, 2007 annual meeting, 18 p., http://geoinfo.nmt.edu/staff/mclemore.htm.

Natural Resources Conservation Service (NRCS), 2001. Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties. U.S. Department of Agriculture. June 2001.

New Mexico Environment Department (NMED), 2012. Letter dated April 23, 2012 to Mr. Billy Ray, Rio Algom Mining, LLC from Mr. Jerry Schoeppner, New Mexico Environment Department, RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-362, Rio Algom Mining, LLC.

Nuclear Regulatory Commission (NRC) United States, 1998. Status of Efforts to Finalize Regulations for Radiological Criteria for License Termination: Uranium Recovery Facilities. April 15, 1998. [NRC Staff Requirements Memorandum SECY-98-084]

_____, 2003. NUREG-1748. Environmental Review Guidance for Licensing Actions Associated with NMSS Programs. Nuclear Regulatory Commission, Washington DC, August 2003.

_____, 2005. Environmental Assessment for the Relocation Plan – Lined Evaporation Ponds at Rio Algom Mining, LLC's Ambrosia Lake Facility (TAC LU0078). June 17, 2005. [ADAMS Accession No. ML051680226]

_____, 2006. Environmental Assessment for the Soil decommissioning Plan Rio Algom Mining LLC's Uranium Mill Facility, Ambrosia Lake, New Mexico. May 15, 2006. [ADAMS Accession No. ML061630291]

_____, 2007. Environmental Assessment for the Tailings Cell 2 Expansion Reclamation Plan Rio Algom Mining LLC's Uranium Mill Facility, Ambrosia Lake, New Mexico. November 2007. [ADAMS Accession No. ML102220253]

_____, 2010. Environmental Assessment for an Alternate On-Site Disposal Cell Location at Rio Algom Mining, LLC's, Uranium Mill Facility, Ambrosia Lake, New Mexico. October 1, 2010. [ADAMS Accession No. ML102220253]

_____, 2017. Letter and SER re: Cessation of Components of the Environmental Monitoring Program. December 20, 2017. [ADAMS Accession No. ML17293A342]

Oak Ridge Associated Universities (ORAU), 2015. Re-Confirmation Survey of the Section 4 Ponds Area at the Rio Algom Ambrosia Lake Facility, Ambrosia Lake, New Mexico. November 17, 2015. [ADAMS Accession No. ML15337A392]

Oak Ridge Institute for Science and Education (ORISE), 2010. Confirmatory Survey Report for the Section 4 Area at the Rio Algom Ambrosia Lake Facility, Ambrosia Lake, New

Mexico. Submitted to the Division of Waste Management and Environmental Protection of the U.S. Nuclear Regulatory Commission. February 12, 2010.

Rio Algom Mining, LLC (RAML), 2001. Application for Alternate Concentration Limits in the Alluvial Materials at the Quivira Mill Facility Ambrosia Lake, New Mexico, Grants, New Mexico: Quivira Mining Company, 2001.

_____, 2004a. Rio Algom Mining LLC, Closure Plan Lined Evaporation Ponds, October 2004. November 1, 2004. Cover through Figure 4-5". November 1, 2004. [ADAMS Accession No. ML050240062]

_____, 2004b. "Rio Algom Mining LLC, Closure Plan Lined Evaporation Ponds, October 2004, Appendix A through End". November 1, 2004. [ADAMS Accession No. ML050240064]

_____, 2006. "Soil Decommissioning Plan for Rio Algom Mining LLC's Ambrosia Lake Facility." May 1, 2006. [ADAMS Accession No. ML061320449]

_____, 2008. Post Closure Monitoring Plan, NRC License #SUA-1473, Rio Algom Mining LLC, Ambrosia Lake, New Mexico, June 1, 2008.

_____, 2016. Rio Algom Mining, LLC, Request for Cessation of Components of the Environmental Monitoring Program at the Ambrosia Lake Facility. August 16, 2016. [ADAMS Accession No. ML16242A149]

_____, 2017a. "Final Radiological Condition and Dose Assessment for the Section 4 Ponds Rio Algom Mining Ambrosia Lake Facility". November 30, 2017. [ADAMS Accession No. ML17340A484]

_____, 2017b. Soil Decommissioning Plan (Updated), Rio Algom Mining LLC, Ambrosia Lake Facility, Grants, New Mexico, Updated November 2017. [ADAMS Accession No. ML17340A482]

_____, 2018a. Calendar Year 2017 ALARA Report for the Ambrosia Lake Facility. June 12, 2018.

_____, 2018b. 2018 Land Use Survey. Rio Algom Mining LLC, Ambrosia Lake Facility. June 15, 2018. [ADAMS Accession No. ML18183A587]

Stone, W. J., F. P. Lyford, P. F. Frenzel, N. H. Mizell, and E. T. Padgett, 1983. Hydrogeology and Water Resources of the San Juan Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Hydrologic Report 6.

SWCA Environmental Consultants (SWCA), 2015. Rio Algom Mill Site Threatened and Endangered Species Habitat Survey, Prepared for Rio Algom Mining LLC, Ambrosia Lake, September 29, 2015.

U.S. Census Bureau (Census Bureau), 2010. 2006-2010 American Community Survey.

FIGURES

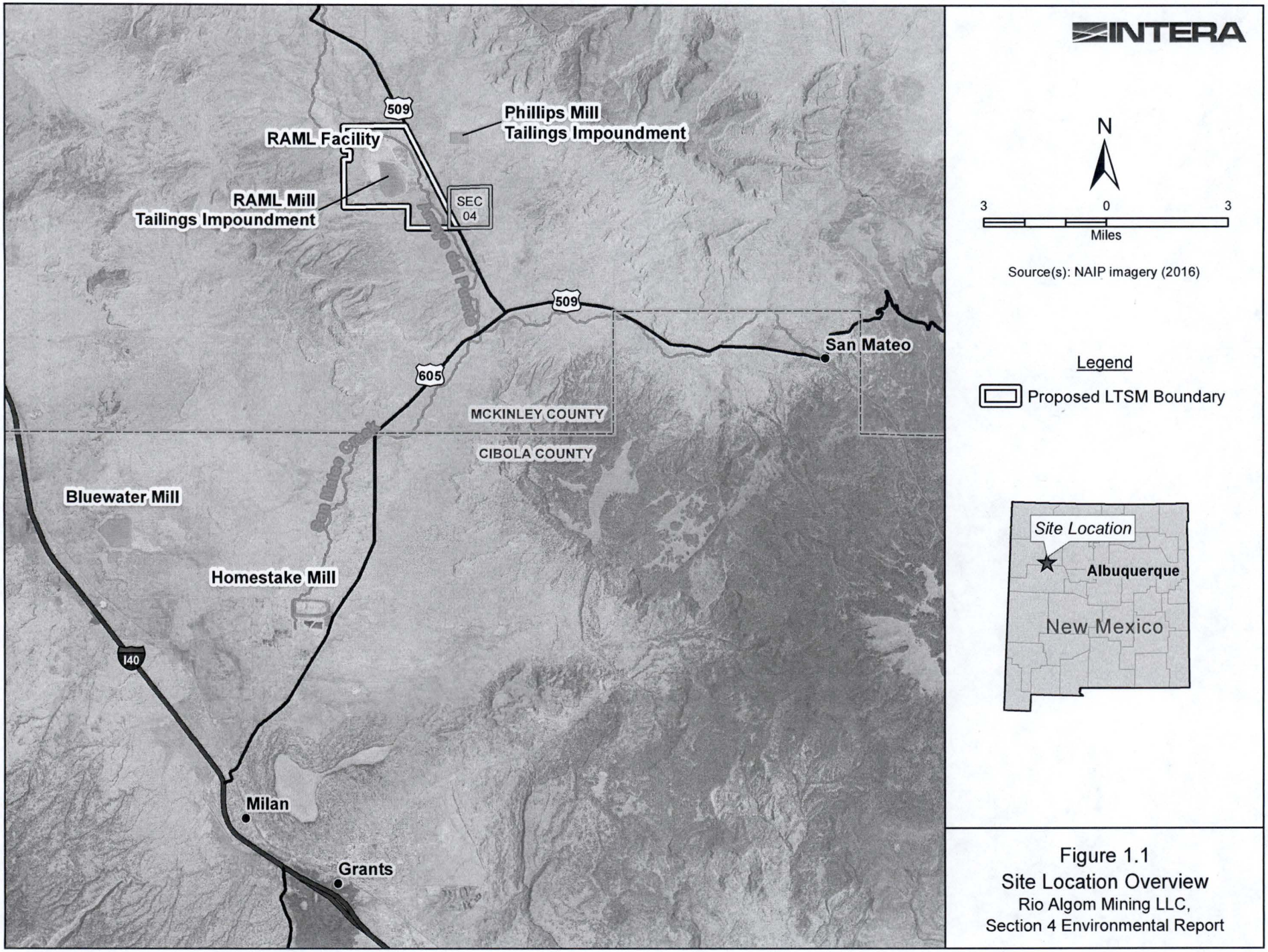
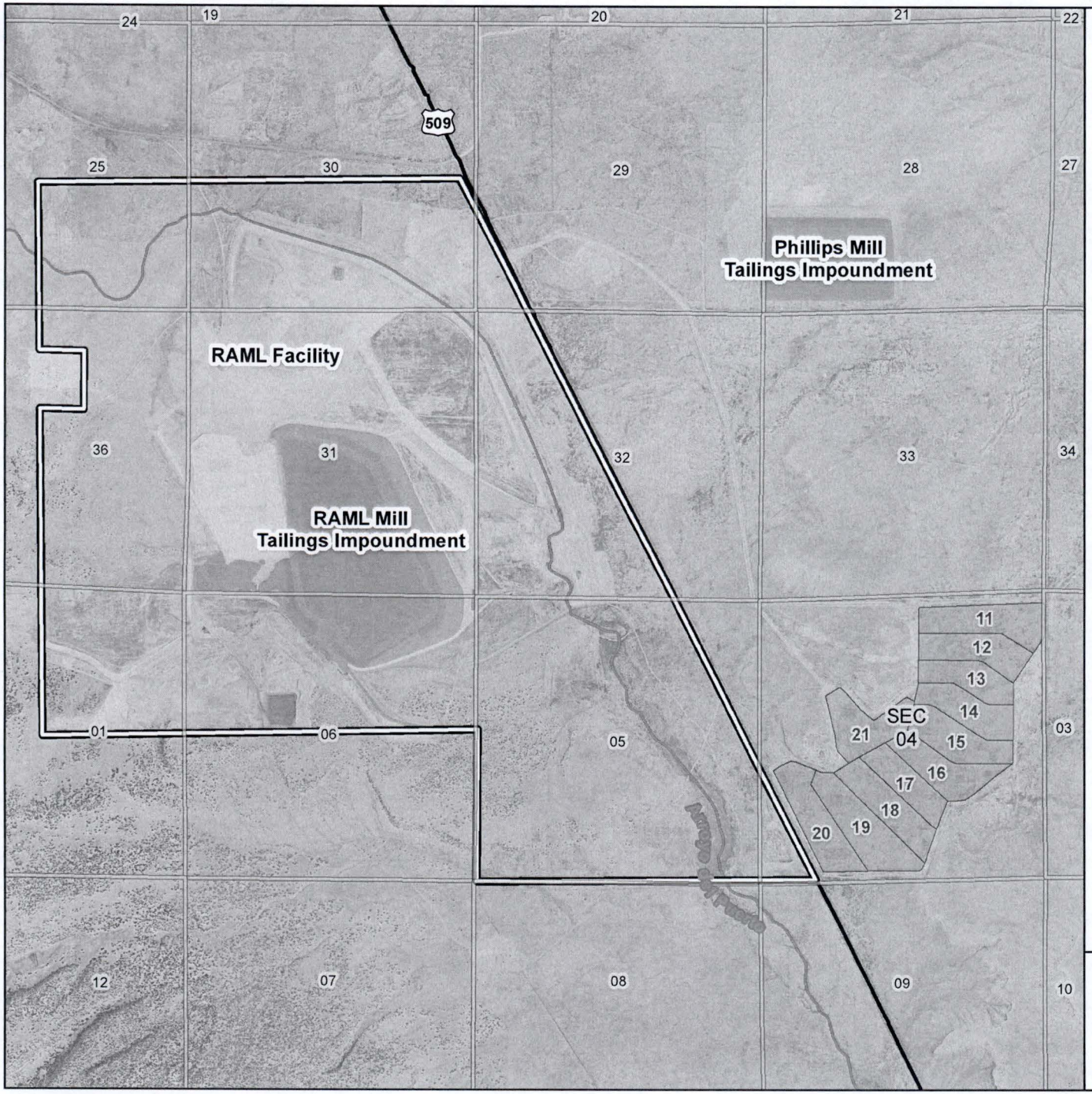


Figure 1.1
Site Location Overview
Rio Algom Mining LLC,
Section 4 Environmental Report

FILE: S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0101_Sec4_SiteOverview.mxd 7/18/2018



INTERA

N

0.5 0 0.5

Miles

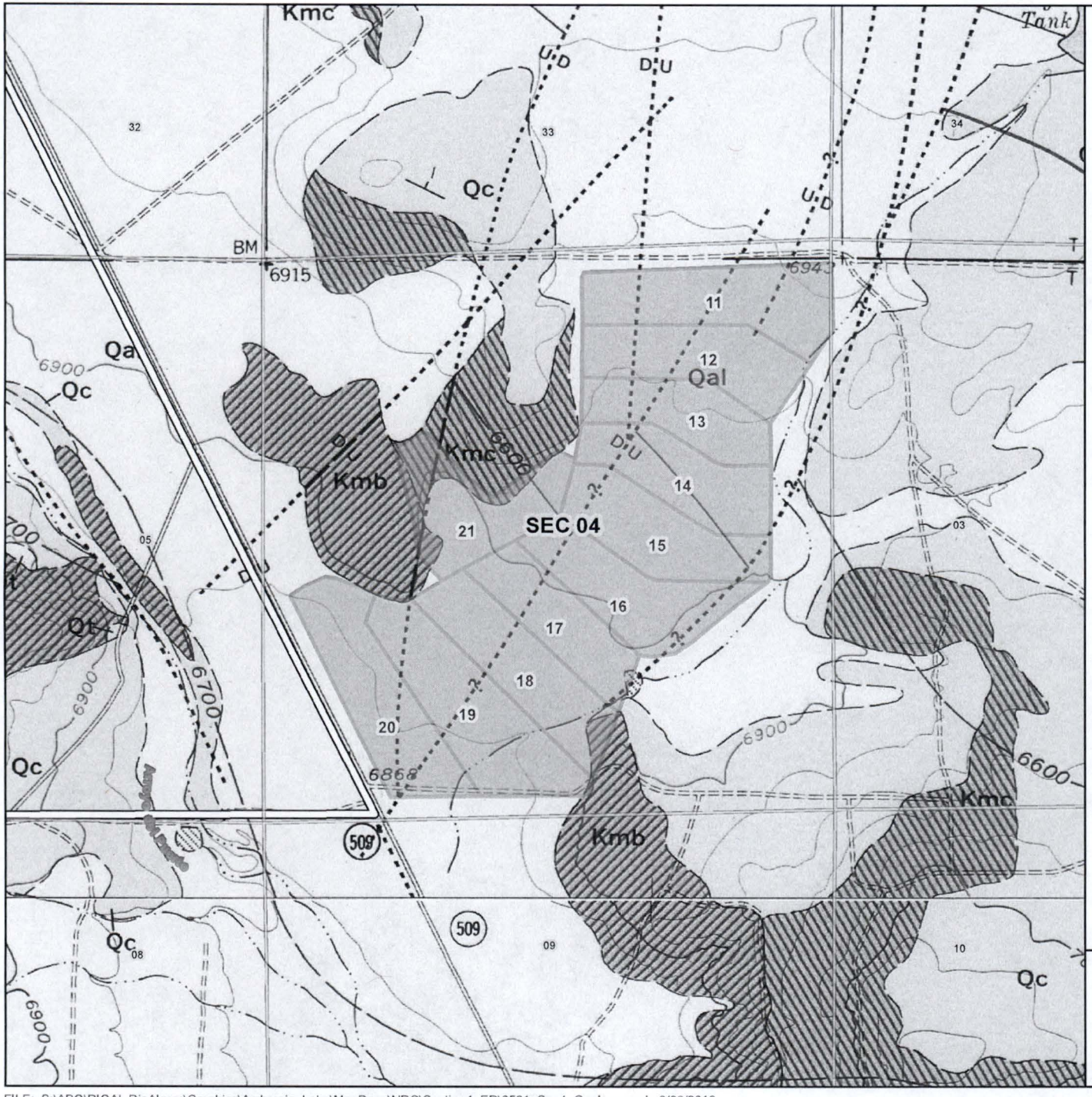
Source(s): NAIP imagery (2016)

Legend

Proposed LTSM Boundary

Figure 1.2
Section 4 Location
Rio Algom Mining LLC,
Section 4 Environmental Report

FILE: S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0102_Sec4_Section4Location.mxd 7/18/2018



INTERA

N

0.25 0 0.25

Miles

Source(s): Geology – USGS, Geologic Map of the Ambrosia Lake Quadragnle, Thaden, et. al., 1966

Legend

Proposed LTSM Boundary

Section 4 Pond

Faults

Dashed where approx. located;

dotted where concealed;

queried where questionable

Qal	Alluvium
Qc	Alluvium (Saprolite)
Kmc	Tres Hermanos C (TRc)
Kmb	Tres Hermanos B (TRb)

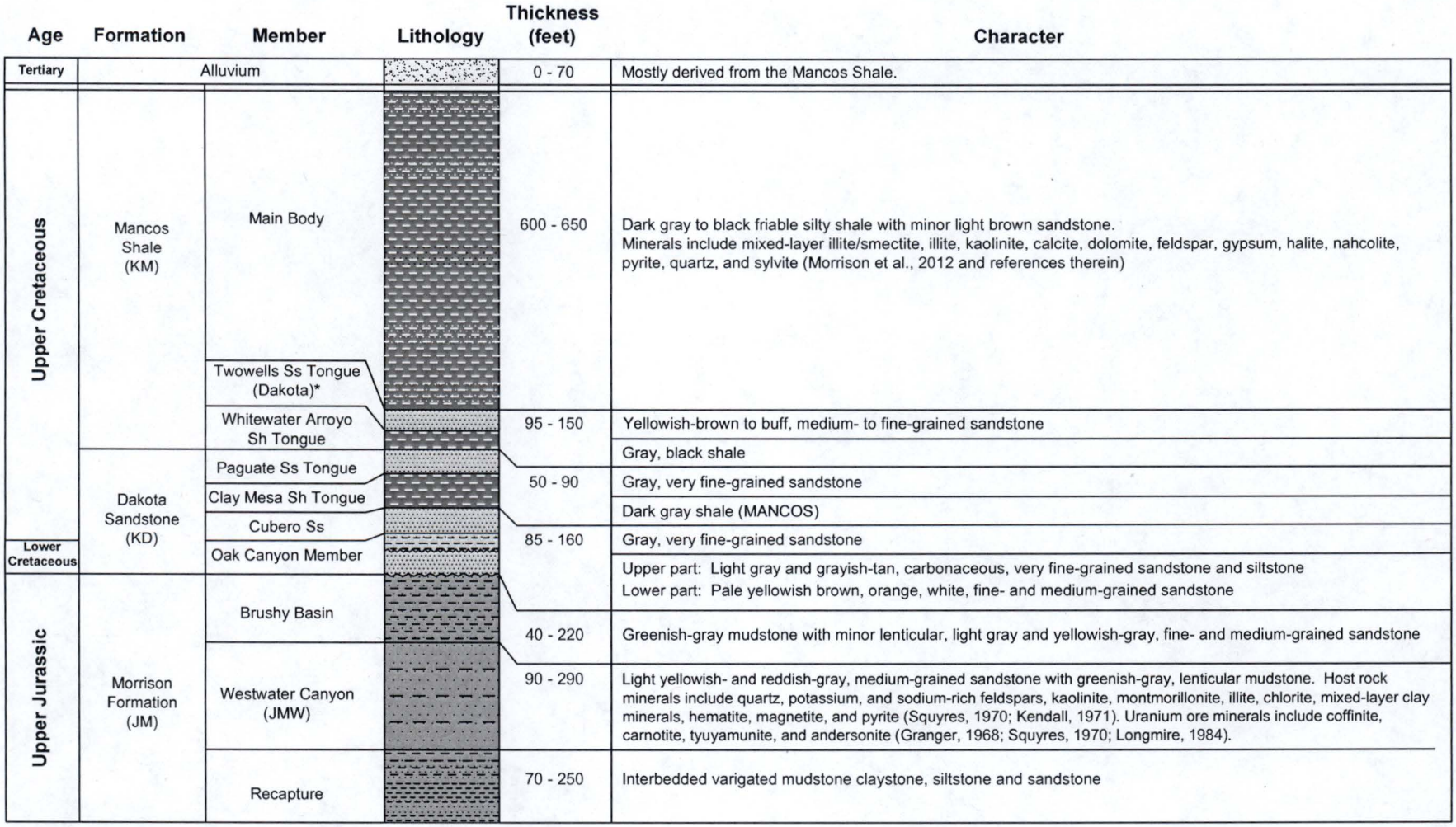
5900

6000

Dakota Sandstone Structural Contours

Figure 5.1
Section 4 Geologic Map
Rio Algom Mining LLC,
Section 4 Environmental Report

FILE: S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0501_Sec4_Geology.mxd 6/28/2018



Modified from W,L, Chenoweth nad E.A. Learned, January 1979 Rautman, C. A. (compiler), Geology and mineral technology of the Grants uranium region 1979: New Mexico Bureau of Mines and Mineral Resources, Memoir 38.

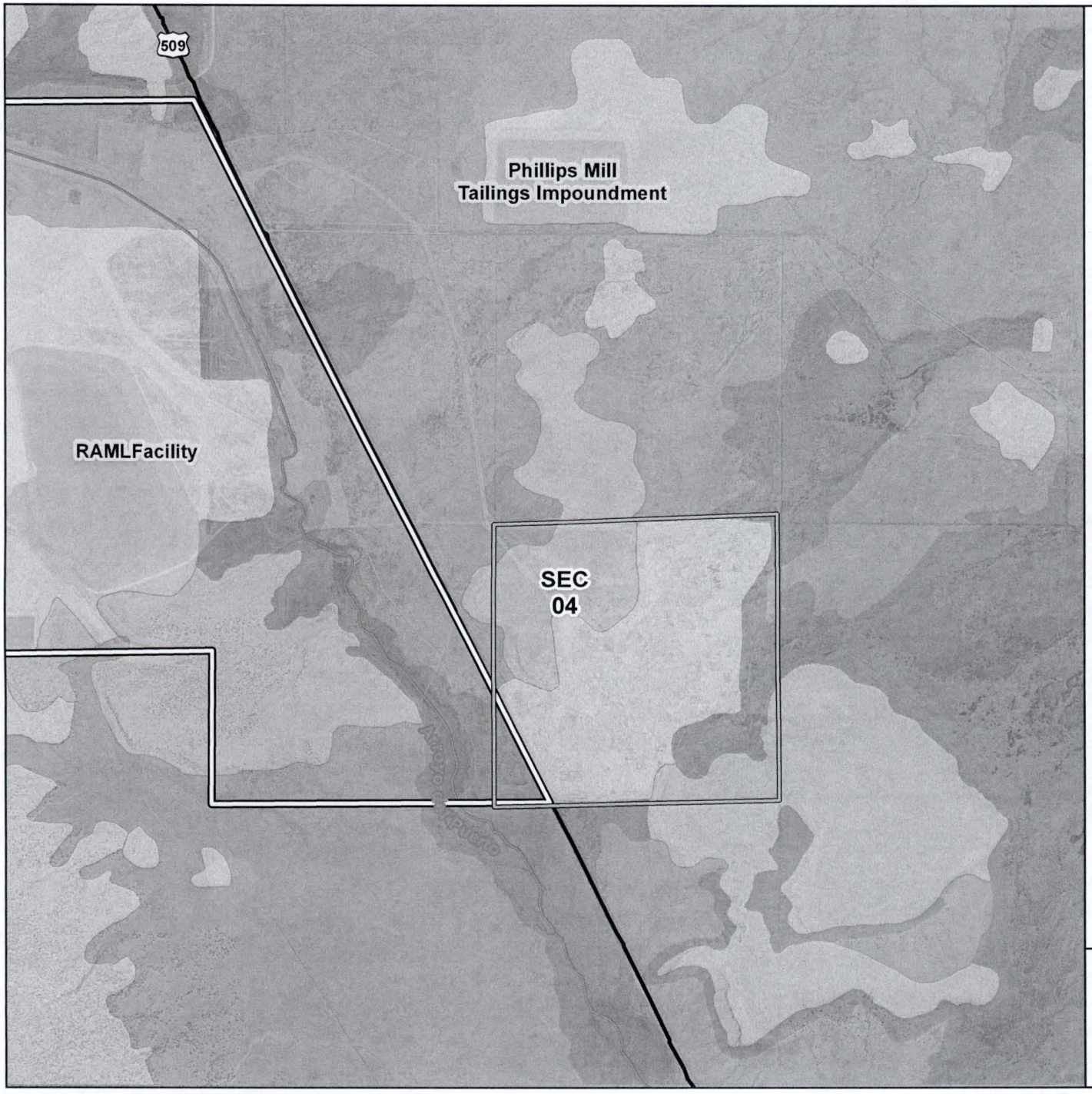
R.G., Marvin (Kerr-McGee Corporation), 1967, Dakota Sandstone - Tres Hermanos Relationship Southern San Juan Basin Area

* = Local terminology: Tres Hermanos C, B, and A. Varying thicknesses, source: Boring logs for monitoring wells 33-02, 35-09, 35-10 (INTERA, 2013).

Figure 5.2
Stratigraphic Column
Rio Algom Mining LLC, Section 4
Environmental Report

INTERA

S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0502_Sec4_StratColumn.dwg



INTERA

N

0.5 0 0.5

Miles

Source(s): NAIP imagery (2016)

Legend

Proposed LTSM Boundary

Soil Survey

- 205: Penistaja-Tintero
- 220: Hagerwest-Bond
- 230: Sparank-San Mateo-Zia
- 250: Hospah-Skyvillage-Rock Outcrop
- 265: Uranium Mined Lands
- 290: Rock outcrop-Westmion-Skyvillage
- 305: Celavar-Atarque

Figure 5.3
Section 4 Soils Map
Rio Algom Mining LLC,
Section 4 Environmental Report

FILE: S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0503_Sec4_SoilsMap.mxd 7/18/2018

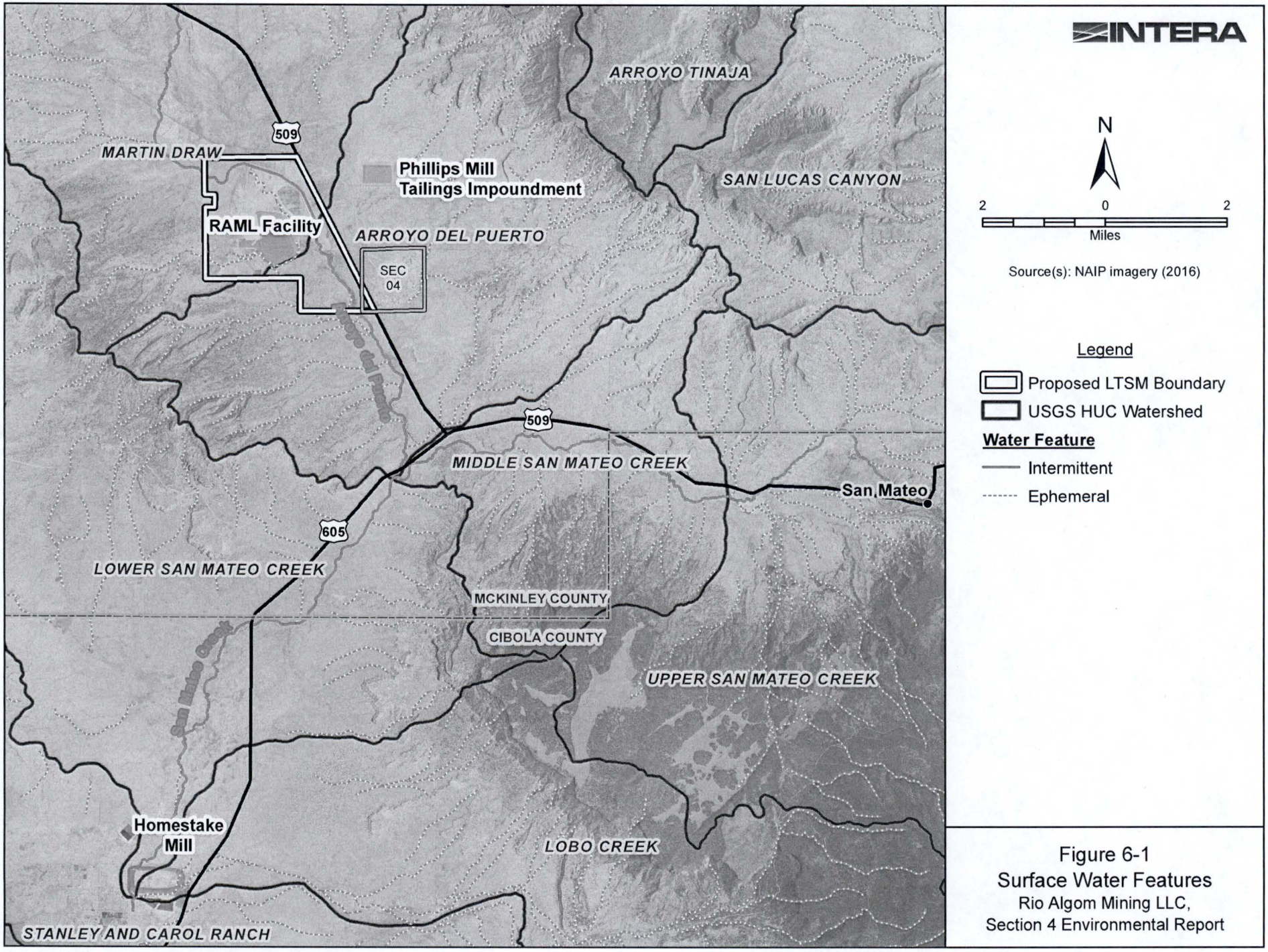


Figure 6-1
Surface Water Features
Rio Algom Mining LLC,
Section 4 Environmental Report

FILE: S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0601_Sec4_SurfaceWater.mxd 7/18/2018

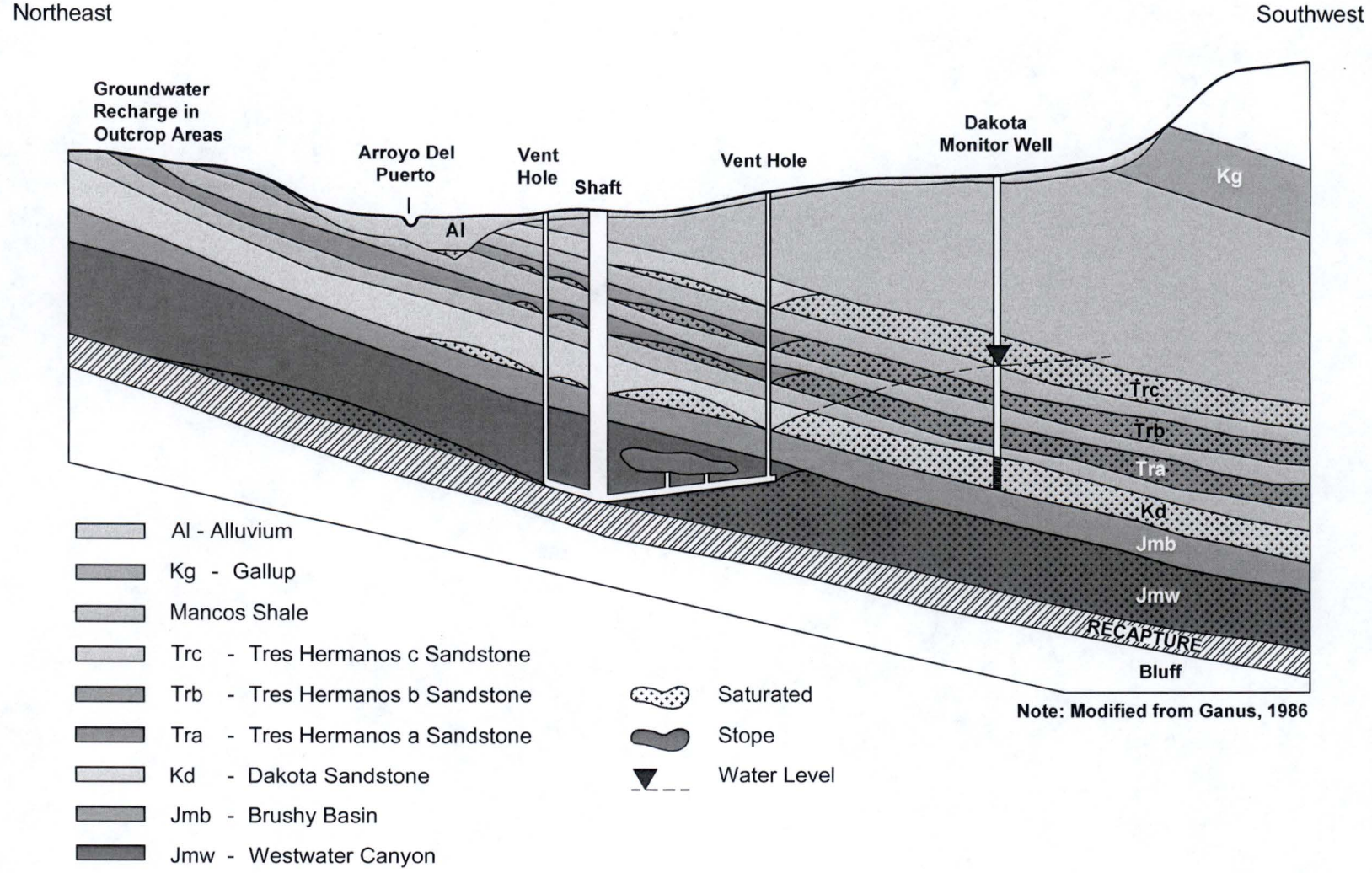
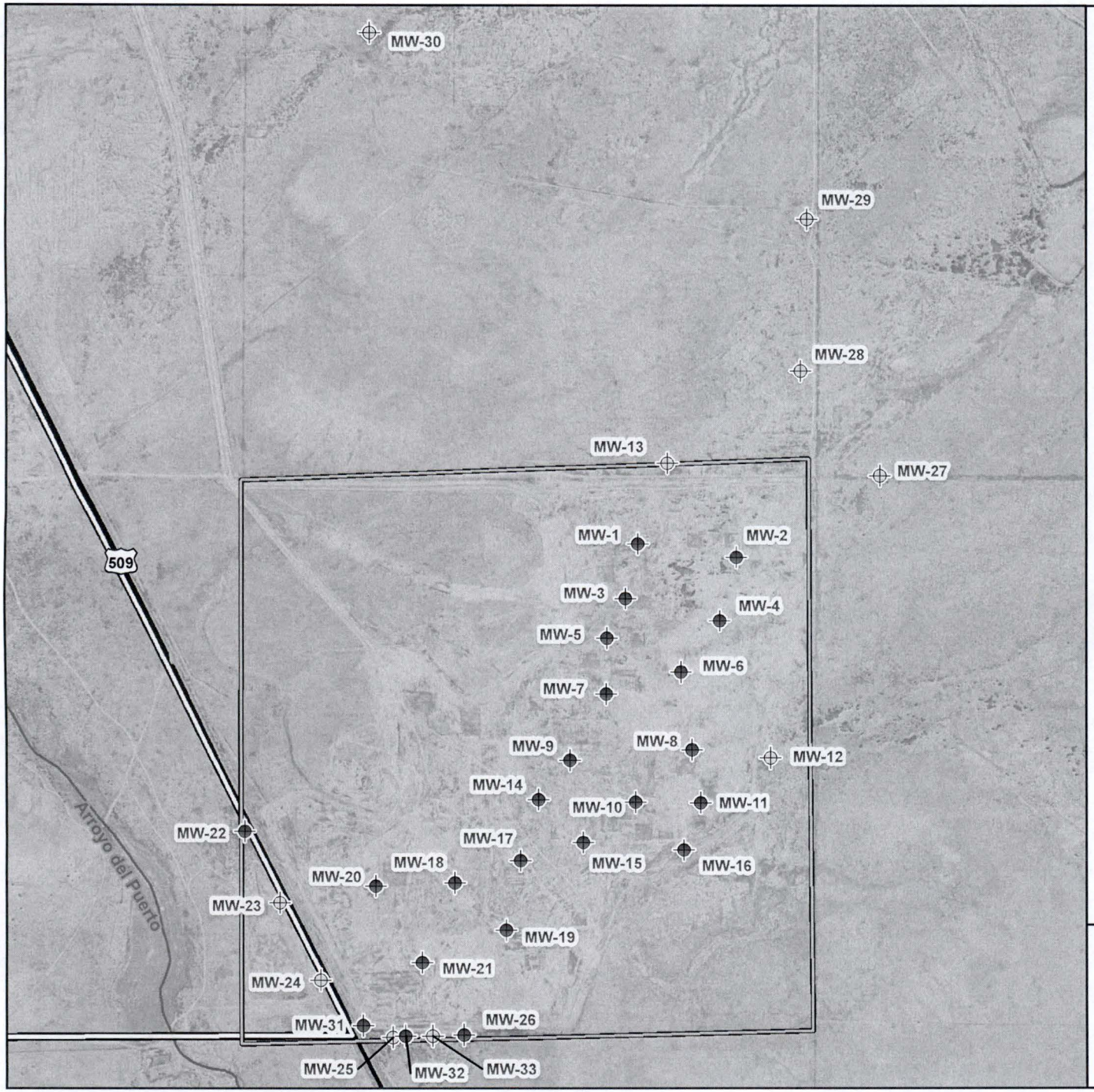


Figure 6.2
Conceptual Site Model
Rio Algom Mining LLC, Section 4
Environmental Report

INTERA

S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0602_ConceptualSiteModel.dwg



INTERA

N

0.25 0 0.25

Miles

Source(s): NAIP imagery (2016)

Legend

- Monitoring Well Location, Section 4 (Dry)
- Monitoring Well Location, Section 4 (with Water)
- Monitoring Well, removed during reclamation
- Proposed LTSM Boundary
- Section 4

Figure 6.3
Section 4 Groundwater Monitoring Wells
Rio Algom Mining LLC,
Section 4 Environmental Report

FILE: S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\0603_Sec4_MonWells.mxd 8/6/2018

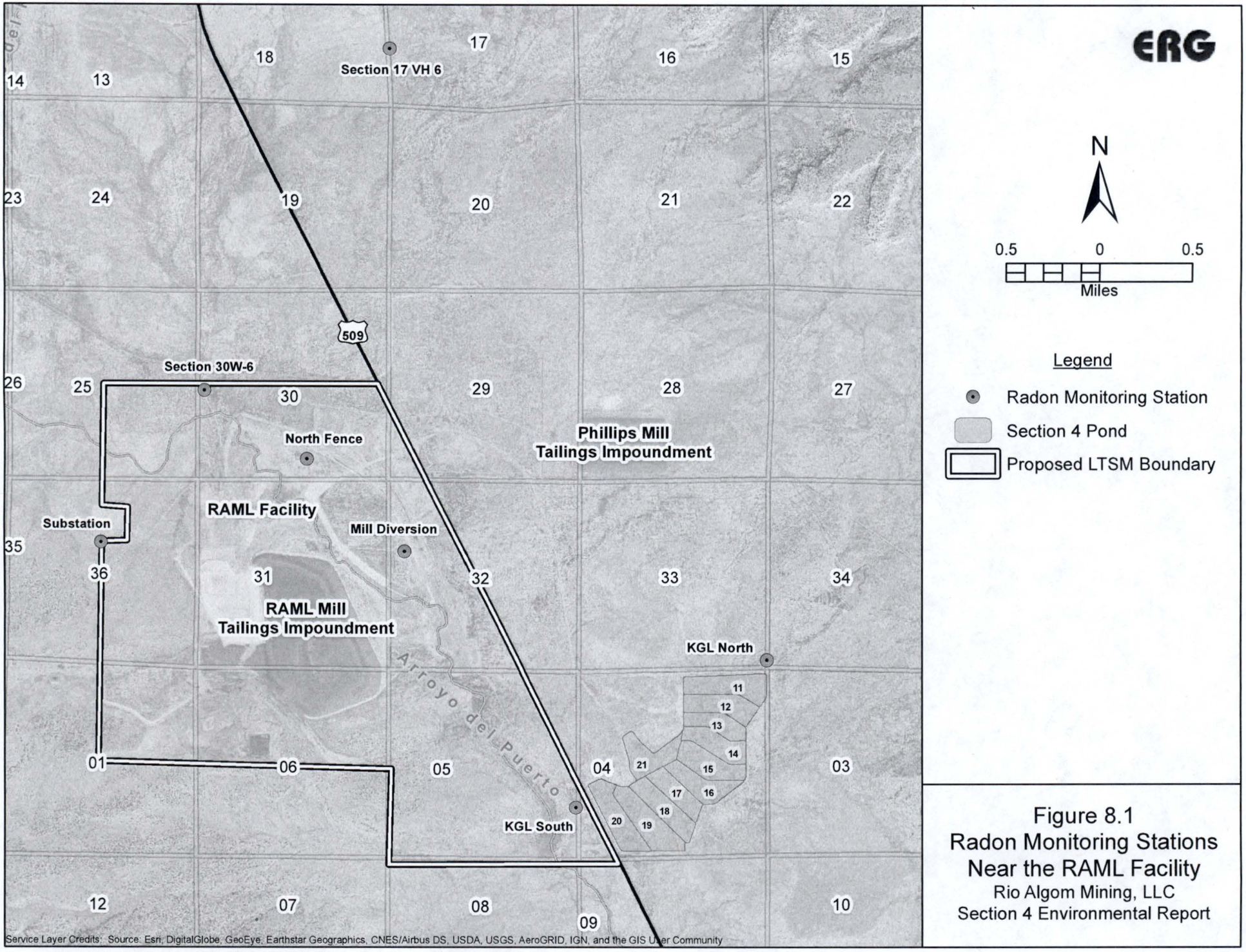


Figure 8.1
Radon Monitoring Stations
Near the RAML Facility
Rio Algom Mining, LLC
Section 4 Environmental Report

Document Path: X:\Project_Data\Rio_Algom\Ambrosia Lake\GIS\Projects\Environmental Monitoring\Environmental_Monitoring_Locations_Sec4.mxd

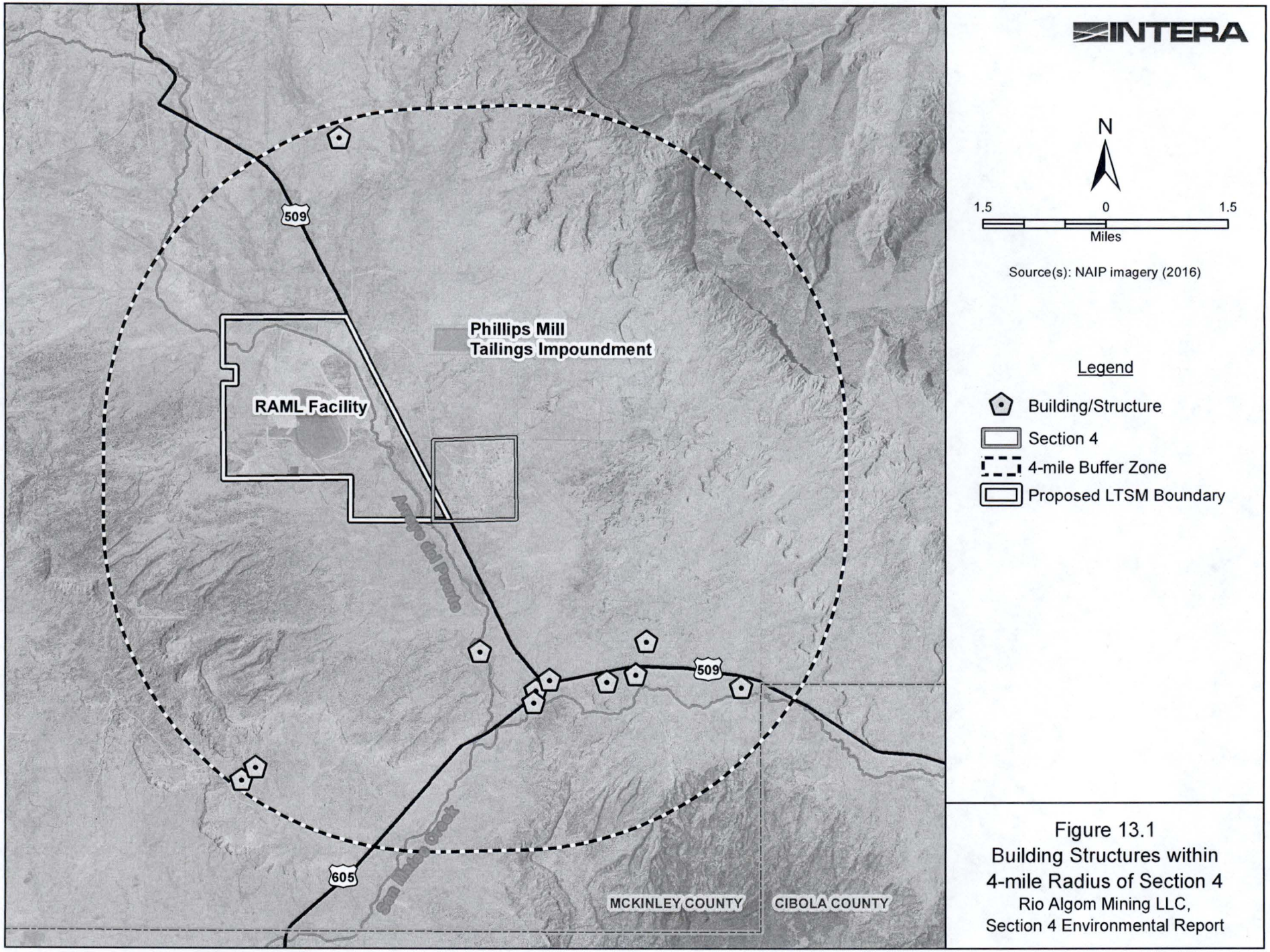


Figure 13.1
Building Structures within
4-mile Radius of Section 4
Rio Algom Mining LLC,
Section 4 Environmental Report

FILE: S:\ABQ\RIOAL.RioAlgom\Graphics\Ambrosia_Lake\MapDocs\NRC\Section4_ER\1301_Sec4_Structures.mxd 7/28/2018