# NMAC 19.10.5.502 Permit Application
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STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

Director
Mining and Minerals Division
1220 South Saint Francis Drive
Santa Fe, NM 87505
(505) 476-3400

# NMAC 19.10.5.502 Existing Mine Permit Application [1]

Pursuant to NMAC 19.10.5.502 D:

**(1) The name of the applicant to whom the permit will be issued:**

Southwest Resources, Inc.
4011 Mesa Verde NE
Albuquerque, NM 87110
(505) 266-2500

**(2) A map(s) and list, including names and addresses, of all owners of surface and mineral estates within the proposed permit area, as shown by the most recent county assessor's property tax schedule:**

For map of proposed permit area, please see **Figure 1**, *attached*.

Applicant Southwest Resources, Inc. 4011 Mesa Verde NE Albuquerque, NM 87110 (505) 266-2500 is both the surface and mineral owner of the proposed permit area.

**(3) A statement of the basis on which the applicant has the right to enter the property to conduct the mining and reclamation. The applicant will allow the Director to examine, if necessary, the documents which establish such basis:**

As demonstrated by the attached quitclaim deed, and the enclosed Findings of Facts and Conclusions of Law, Southwest Resources is the owner of the Southwest quarter, Section 12 , 14 N, R 10 W and Section 11, quarter quarter section , NE quarter , Township 14 N R 10 W proposed permit area.

**(4) The site assessment previously submitted pursuant to Section 69-36-5 of the Act shall be considered part of the application. If information in the site assessment requires updates to provide information necessary for evaluation of the permit or if the site-specific conditions at the time of the assessment significantly deviate from conditions at**

[1] The following information is required by the *New Mexico Mining Act* NMSA 1978 § 69-36-1 et seq. and associated regulations under the New Mexico Administrative Code.

**the time of submittal of the permit application, such updated information or deviations must be described in the application:**

Please see attached site assessment incorporated and filed concurrently with this application.

**(5) A map(s) showing all existing and proposed pits, shafts, adits, stockpiles, waste units, impoundments, leach piles, processing facilities, and support facilities such as office buildings. The map(s) shall identify the proposed permit area and design limits of each unit of the operation.**

*See* **Figure 1** and **Figures (A-1, A- 2, A-3),** *attached.*

(6) **A description of undisturbed vegetation including a comprehensive list of species and their relative abundance with regards to cover and production:**

The vegetation in the area of the site is typical of an arid desert environment in which plants are adapted to the typically dry conditions. Plant species present in the area were determined during regional studies that were performed as part of the environmental assessment for the Ambrosia Lake Uranium Mill. Species encountered during the surveys are presented below (The most abundant vegetation with respect to cover and production in the region are indicated in bold relative to other species listed).

Plant species observed in the Ambrosia Lake region:

| *Scientific Name* | *Common Name* | *Scientific Name* | *Common Name* |
|---|---|---|---|
| Abronia sp./ | Sandverbena | Muhlenbergia torreyi / | Ring muhly |
| Agropyron smithii/ | Western Wheatgrass | Oenothera albicaulis / | Evening primrose |
| Aristida longiseta/ | Red Threeawn | Oenothera pallida/ | Pale evening primrose |
| Aristida purpurea/ | Purple Threeawn | Oryzopsis hymenoides/ | **Indian Rice grass** |
| Artemisia nova/ | **Black Sagebrush** | Penstemon sp. Penstemon | |
| Astragalus sp./ Milkvetch | | Phacelia corrugate/ | Scorpion weed |
| Aster sp. Aster | | Phlox sp. /Phlox | |
| Atriplex canescens/ | **Fourwing saltbrush** | Plantago purshii/ Plantain | |
| Atriplex confertifolia/ | Shadscale | Psoralea lanceolata Scurfpea | |
| Atriplex obovata/ Saltbrush | | Purshia tridentate/ | Antelope bitterbrush |
| Bromus tectorum/ Cheatgrass | | Rhus trilobata/ | Skunkbrush sumac |

Chrysothamnus nauseosus/**Rubber rabbitbrush**

Chrysothamnus viscidiflorus/ Green rabbitbrush

Cowania Mexicana/ Cliff rose

Cryptantha crassisepala Cat's eye

Dithyrea wislizenii/ Spectaclepod

Ephedra torreyana Ephedra

Eriogonum sp./ Buckwheat

Euphorbia fendleri /Spurge

Eurotia lanata/ Winterfat

Festuca octoflora/ Sixweek fescue

Gutierrezia sarothrae/ **Snakeweed**

Hordeum pusillum/ Little barley

Juniperus sp./ **Juniper**

Lactuca sp./ Wild lettuce

Lappula Sp./ Stickseed

Lycium pallidum/ Pale wolfberry

Rumex crispus/ Curly dock

Sarcobatus vermiculatus/ **Greasewood**

Sisymbrium altissimum/ **Tumble mustard**

Sitanion hystrix/ **Bottlebrush squirrel tail**

Sphaeralcea parvifolia/ **Globemallow**

Sporobolus airoides Alkali sacaton

Sporobolus contractus/ Spike dropseed

Sporobolus cryptandrus/ Sand dropseed

Sporobolus giganteus/ Giant dropseed

Stipa comate/ Needle and thread

Stipa neomexicana/ Feathergrass

Suaeda torreyana/ Seepweed

Tridens pulchellus/ Fluffgrass

Verbesina encelioides/ Golden Crownsbeard

Yucca sp./ **Yucca**

**(7) Evidence that other applicable state and federal permits to be obtained either have been or will be issued before the activities subject to those permits begin:**

**n/a**

**(8) The applicant shall designate an agent and provide the agent's street address for the service of notices and orders in writing from the Director. This information shall be kept current if a permit is granted:**

Operator's representative and agent for service of process:
George Lotspeich,

4011 Mesa Verde NE
Albuquerque, NM 87110
(505) 266-2500

**(9) A copy of the proposed form of notices required under 19.10.9 NMAC:**

*See* attached form of *Notice of Application* to be published in Cibola Beacon and the Gallup Independent together with proof of certified mail to: the Navajo tribe, McKinley County, the Environment Department, the State Engineer, the Department of Game and Fish, the Forestry Division, the State Historic Preservation Division, property owners of record within ½ mile of the proposed mine, and additional interested parties requesting notification.

**(10) A permit fee as determined pursuant to 19.10.2 NMAC:**

*See* attached permit fee, **Table 1**.

**(11) Any additional information necessary for evaluation of the permit application as required by the Director:**

The attached Part V permit application is being submitted by Order of the Director of the Mining and Minerals Division (October 22, 2013) after one extension granted to January 31, 2014.

Pursuant to NMAC 19.10.5.502 C,

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals responsible for obtaining the information, I believe the submitted information is true, accurate, and complete.

**Signature of applicant:** George Lotspeich

**Printed name of Applicant:** George Lotspeich

**Title/Position:** Owner/President/intended agent for service of process

**Date:**

The foregoing application was personally acknowledged before me this 29th day of January, 2014 by George Lotspeich.

**STATE OF NEW MEXICO** )
)ss.
**COUNTY OF BERNALILLO** )

Witness my hand and official seal.

Jeanne Cameron Washburn
Notary Public

My commission expires: 8/11/14

(sea

OFFICIAL SEAL
Jeanne Cameron Washburn
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 8/11/14

JUL-31-1996 09:48 FROM MESSINA LAW FIRM TO 2662900 P.01

STATE OF NEW MEXICO } ss. 8931
County of Hidalgo
Filed for record in

BOOK 444 PAGE 1136

11:48 AM MAY 08 1995

Recorded in Book 25, Page(s) 1103
of the records of MINING RECORDS
By: Belinda Chavez, County Clerk
Deputy

25-1103
443346
BOOK 552 PAGE 148

# QUITCLAIM DEED

COBB RESOURCES CORPORATION, A NEW MEXICO CORPORATION

for consideration paid, quitclaim

to SOUTHWEST RESOURCES, INC., A NEW MEXICO CORPORATION

whose address is 313 WASHINGTON STREET S.E., ALBUQUERQUE, NEW MEXICO

the following described real estate in McKINLEY, SOCORRO & HIDALGO COUNTIES ~~County~~, New Mexico:
and PARK COUNTY, COLORADO:

(A) THE MINING PROPERTY LOCATED IN PARK COUNTY, COLORADO, COMMONLY KNOWN AS THE LONDON MINE, INCLUDING WITHOUT LIMITATION ANY AND ALL RESIDUAL RIGHTS TO MINING CLAIMS AND MINERAL INTERESTS;

(B) THE MINING PROPERTY LOCATED IN McKINLEY COUNTY, NEW MEXICO, COMMONLY KNOWN AS THE AMBROSIA LAKE MINE, INCLUDING WITHOUT LIMITATION ANY AND ALL RESIDUAL RIGHTS TO MINING CLAIMS AND MINERAL INTERESTS;

(C) COBB RESOURCES' INTERESTS IN THE MINING PROPERTY LOCATED IN SOCORRO COUNTY, NEW MEXICO, COMMONLY KNOWN AS THE VINDICATOR MINE, INCLUDING WITHOUT LIMITATION ANY AND ALL OF COBB'S INTEREST IN ANY AND ALL RESIDUAL RIGHTS TO MINING CLAIMS AND MINERAL INTERESTS;
and

(D) THE MINING PROPERTY LOCATED IN HIDALGO COUNTY, NEW MEXICO, COMMONLY KNOWN AS THE JOHNNY BULL MINE, INCLUDING WITHOUT LIMITATION ANY AND ALL RESIDUAL RIGHTS TO MINING CLAIMS AND MINERAL INTERESTS.

STATE DOCUMENTARY FEE
DATE 10-1-95
$ 0.

264103 B-8 P-9011 04/13/95 11:26A PG 1 OF 1
CAROL K. SLOAN MCKINLEY COUNTY CLERK'S OFFICE

443346 06/08/1995 10:30 552/148-148 $ 5.00 $ 0.00
BARBARA J. PASCO, PARK CNTY RECORDER

WITNESS my hand and seal this 21st day of June 19 94

COBB RESOURCES CORPORATION

BY: Charles Cobb (Seal)

CHARLES COBB, IV., President

(Seal) (Seal)

(Seal) (Seal)

## ACKNOWLEDGMENT FOR NATURAL PERSONS

STATE OF ~~NEW MEXICO~~ TEXAS
ss.
COUNTY OF BRAZORIA

The foregoing instrument was acknowledged before me this day of 19

by
(Name or Names of Person or Persons Acknowledging)

My commission expires:
(Seal)

Notary Public

## ACKNOWLEDGMENT FOR CORPORATION

FOR RECORDER'S USE ONLY

STATE OF ~~NEW MEXICO~~ TEXAS

**BEFORE THE DIRECTOR OF THE MINING AND MINERALS DIVISION**
**ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT**
**IN THE MATTER OF SOUTHWEST RESOURCES, INC.'s APPLICATION FOR A MINIMAL IMPACT NEW MINING OPERATIONS PERMIT FOR THE SECTION 11/12 MINE, AMBROSIA LAKE, NEW MEXICO**

# DIRECTOR'S ORDER WITH FINDINGS OF FACT AND CONCLUSIONS OF LAW

THIS MATTER having come before the Director ("Director") of the Mining and Minerals Division ("MMD"), of the Energy, Minerals and Natural Resources Department, of the State of New Mexico, upon submittal by Southwest Resources, Inc. ("SRI") of an Application for a Minimal Impact New Mining Operations Permit ("Application") to continue mining operations within Section 11 and 12, T14N, R10W, at Ambrosia Lake, New Mexico ("Section11/12 Mine"),

The Director, having considered the Application and associated documentation, having reviewed the MMD files and being otherwise fully advised in the premises now enters the following Findings of Fact, Conclusions of Law and Order:

## FINDINGS OF FACT

1. On March 8, 2013 SRI submitted an Application for a Minimal Impact New Mining Operation for the inactive Section 11/12 Mine, an underground uranium mine.

2. The Section 11/12 Mine is located in Sections 11 and 12, T14N, R10W, McKinley County, New Mexico, in the Ambrosia Lake Mining District. The Section 11/12 Mine was operated by Cobb Resources, the predecessor operator in interest for the Section 11/12 Mine to SRI, from 1974 to 1982.

3. The surface and mineral estates at the Section 11/12 Mine are private and now are owned by SRI.

4. Upon review of the Application, the Director determined that the Section 11/12 Mine is an "existing mining operation" pursuant to 19.10.1.7.E(2) NMAC. This finding is based on (i) the 1974 to 1982 dates of operation reported in the Application, as well as (ii) a July 1, 1981 article in *Inc.* magazine that reported volume uranium production from the Section 11/12 Mine from 1978 through 1980.

5. Review of the Application further revealed that the existing mining operation does not qualify as a "minimal impact existing mining operation" pursuant to 19.10.3.303.A NMAC. This finding is based on (i) the stated intention within the Application to continue mining operations upon permit approval, and (ii) the existing mining operation has resulted in disturbance of more than 10 acres of land, excluding permanent roads. The Application states that 15 acres are to be disturbed. However, the Director determined that additional disturbed acreage associated with a diversion ditch and berm that was constructed to divert surface runoff away from Ambrosia Lake and the Section 11/12 Mine results in a total existing disturbance of approximately 18 acres.

6. An existing mining operation that does not meet the requirements of a minimal impact existing mining operation, must otherwise be considered a 19.10 Part 5 NMAC existing mining operation.

7. SRI, as the successor operator in interest for the Section 11/12 Mine, has not met the timing of submittal and deadline for obtaining approval of permit application requirements for an existing mining operation pursuant to 19.10.5.501 NMAC.

## CONCLUSIONS OF LAW

1. The Application for a Minimal Impact New Mining Operation for the Section 11/12 Mine, dated March 8, 2013 does not meet the requirements of the Mining Act and 19.10 NMAC and must therefore be denied.

2. SRI is currently not in compliance with the 19.10.5.501 NMAC requirements for submitting an application and obtaining MMD approval of a permit for the Section 11/12 Mine.

3. In order to continue mining operations at the Section 11/12 Mine, submittal of a permit application and closeout plan by SRI that meets the requirements of 19.10.5 NMAC is required.

4. In lieu of MMD initiating an enforcement action against SRI as the successor operator of the Section 11/12 Mine for failure to comply with 19.10.5.501 NMAC, the abatement for which would be to apply for the appropriate permit, and because SRI has voluntarily begun the permitting process, the interests of administrative economy will best be served by SRI directing its resources toward the permitting of the Section 11/12 Mine as an existing mining operation pursuant to Title 19 Chapter 10 Part 5 NMAC.

## ORDER

NOW, therefore it is hereby ordered that:

1. The Application for a Minimal Impact New Mining Operation for the Section 11/12 Mine, dated March 8, 2013 does not satisfy the requirements of the Mining Act and 19.10 NMAC and is denied.

2. SRI shall submit to MMD a permit application and closeout plan for the Section 11/12 Mine, no later than December 20, 2013, in accordance with the requirements of Title 19 Chapter 10 Part 5 NMAC.

3. Upon notice from MMD that the Section 11/12 Mine closeout plan is approvable, but prior to permit issuance, SRI shall provide a financial assurance proposal pursuant to 19.10.12 NMAC.

4. Should SRI fail to meet the deadlines prescribed by this Order, MMD may initiate formal enforcement proceedings against SRI under the Mining Act.

By Order of the Director of the Mining and Minerals Division

Fernando Martinez

10/22/2013
Date

# Legal Notice

Pursuant to the New Mexico Mining Act Rules, NMAC 19.10.5; 19.10.9.902, and 903 (A-H), Southwest Resources, Inc. (Southwest) applied January 31, 2014 to the New Mexico Energy, Minerals and Natural Resources Department (EMNRD) to approve an NMAC 19.10.5.502 (Part 5) application to permit operation of an existing uranium mine.

Name and Address of Applicant:

Southwest Resources, Inc.
4011 Mesa Verde NE
Albuquerque, NM 87110

The proposed permit area is located in the Southwest quarter, Section 12, 14 N, R 10 W and Section 11, south half, NE quarter, Township 14 N R 10 W, McKinley County. It is commonly known as the Ambrosia Lake Mine, which is an existing mine.

Mining operations are currently inactive. The total proposed permit area is 15 acres more or less. Proposed uranium mining operations do not involve dewatering. Ore mined will be upon market order minimizing storage and ore will be processed off site. New construction is not necessary. The proposed closeout plan includes a description of how the permit area will be reclaimed to meet the requirements and regulatory performance standards under the Act.

A copy of the application is available for viewing during normal business hours at:

New Mexico Energy, Minerals and Natural Resources Department
Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

The application can also be viewed or downloaded from the New Mexico Energy, Minerals and Natural Resources Department website at:

http://www.emnrd.state.nm.us/MMD/MARP/PermitPendMineRegEx.html

Written comments regarding the application may be submitted to:

Mr. Fernando Martinez , Director, Mining and Minerals Division, 1220 South St. Francis Drive, Santa Fe, New Mexico 87505.

Procedure and deadline for requesting a hearing:

Any interested person may request that the Director conduct a hearing on the application. A request for public hearing must be made within 30 days of the date of newspaper publication of the notice of the application unless the Director determines that a longer period in which to make a request is appropriate and such period is specified in the public notice. If a hearing is timely requested, the Director shall set a hearing unless the request is clearly frivolous. The Director may hold a public hearing absent any request.

The date, time and location of the public hearing shall be advertised by the Director in a newspaper of general circulation in the locality of the operation. The advertisement shall also identify the applicant, the operation, the purpose of the hearing, and how to contact the Division for additional information.

All persons who have submitted written requests in advance to receive notices of hearing to the Director or who have provided comments on the application to the Director shall be mailed notice at least 30 days prior to the hearing.

The nearest community to the mining or exploration operation with adequate and accessible public facilities will be the site for any public hearing.

All interested persons may submit written comments regarding the application to the Director. Written comments must be received by the Director prior to the close of the hearing record following any public hearing that is held. If no public hearing is held, written comments will be considered only if they are received by the Director within 60 days after the newspaper publication of the notice of the application or within 60 days after the person filling the comment received notice of the application, whichever is later.

An additional opportunity for a public hearing may be provided if the applicant makes substantial changes in the proposed action, if there are significant new circumstances or information bearing on the proposed action or if the applicant proposes to substantially increase the scale or substantially change the nature of the proposed action and there is public interest and a request for a public hearing.

# Aviso Legal

De conformidad con el Reglamento de la Ley de Minería de Nuevo México , NMAC 19.10.5; 19.10.9.902 y 903 ( AH), Southwest Resources, Inc. ( suroeste ) aplicado 31 de enero 2014 a la Energía de Nueva México , Minerales y Recursos Naturales ( EMNRD ) para aprobar una NMAC 19.10.5.502 (Parte 5 ) la aplicación para permitir la operación de una mina de uranio existente.

Nombre y dirección del solicitante:

Southwest Resources, Inc.
4011 Mesa Verde NE
Albuquerque, NM 87110

El área propuesta de permiso se encuentra en el barrio suroeste , Sección 12 , 14 N , R 10 W y la sección 11 , la mitad sur, cuarto NE, municipio 14 NR 10 W , el condado de McKinley. Se conoce comúnmente como el Lake Mine Ambrosia , que es una mina existente .

Las operaciones mineras son actualmente inactivas. La superficie total propuesta de permiso es de 6 hectáreas, más o menos. Las operaciones de extracción de uranio propuestas no implican la deshidratación. Mineral extraído será sobre el orden del mercado minimizando el almacenamiento y el mineral será procesado fuera del sitio. Nueva construcción no es necesario. El plan de cierre propuesto incluye una descripción de cómo se recuperó el área permitida para cumplir con los requisitos y estándares de desempeño regulatorio en virtud de la ley.

Una copia de la aplicación está disponible para su visualización durante el horario normal en:

New Mexico Energy, Minerals and Natural Resources Department
Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

La aplicación también se puede ver o descargar de la Energía de Nueva México, Minerales y Recursos Naturales sitio web del Departamento en:

http://www.emnrd.state.nm.us/MMD/MARP/MARPPermitsRevModClose.html

Los comentarios por escrito acerca de la aplicación pueden ser enviados a:

Mr. Fernando Martinez , Director, Mining and Minerals Division, 1220 South St. Francis Drive, Santa Fe, New Mexico 87505.

Procedimiento y plazo para solicitar una audiencia:

Cualquier persona interesada podrá solicitar que el director lleve a cabo una audiencia sobre la solicitud. La solicitud de audiencia pública deberá hacerse dentro de los 30 días de la fecha de publicación del periódico de la notificación de la solicitud a menos que el Director determina que un período más largo para hacer una petición es apropiada y dicho período se especifica en el aviso público . Si se solicita una audiencia a tiempo, el Director fijará una audiencia , a menos que sean manifiestamente frívola. El Director podrá celebrar una audiencia pública en ausencia de cualquier petición.

La fecha, hora y lugar de la audiencia pública serán anunciados por el Director en un periódico de circulación general en la localidad de la operación. El anuncio también identificará al solicitante, la operación, el propósito de la audiencia, y cómo comunicarse con la División para obtener información adicional.

Todas las personas que han presentado solicitudes por escrito con antelación para recibir las notificaciones de oír al director o que han formulado observaciones sobre la solicitud al Director deberá ser enviado por correo una antelación mínima de 30 días antes de la audiencia.

La comunidad más cercana a la minería o la operación de exploración con los servicios públicos adecuados y accesibles será la sede de una audiencia pública.

Todas las personas interesadas pueden presentar observaciones por escrito en relación con la solicitud al Director. Los comentarios por escrito deben ser recibidas por el Director antes del cierre del registro de la audiencia después de una audiencia pública que se celebre. Si no se celebra audiencia pública, los comentarios escritos serán considerados sólo si son recibidos por el Director dentro de los 60 días siguientes a la publicación del periódico de la notificación de la solicitud o dentro de los 60 días posteriores a la persona que llene el comentario recibido notificación de la demanda, lo que sea posterior.

Una oportunidad adicional para una audiencia pública puede ser proporcionada si el solicitante realiza cambios sustanciales en la acción propuesta, en caso de nuevas circunstancias o información que tenga la acción propuesta o si el solicitante se propone aumentar considerablemente la escala o sustancialmente cambiar la naturaleza de importantes la acción y no se propone es de interés público y la solicitud de una audiencia pública.

# NMSA 1978 § 69-36-5 (B) (1993) Mining Operation Site Assessment

On behalf of: Southwest Resources, Inc.
4011 Mesa Verde NE
Albuquerque, NM 87110
(505) 266-2500

Submitted to: Director,
Mining and Minerals Division
1220 South Saint Francis Drive
Santa Fe, NM 87505
(505) 476-3400

**(1) Identification of a proposed permit area for the mining operation**

The proposed permit area is located in the Southwest quarter, Section 12, 14 N, R 10 W and Section 11, south half, NE quarter quarter, Township 14 N R 10 W, McKinley County. It is commonly known as the Ambrosia Lake Mine, which is an existing mine. This mine is an underground uranium mine that operated in 1959 and 1962 and from 1974-1982. Mining operations are currently inactive. The total proposed area of disturbance is 15 acres more or less. ***See* Fig.** 1, attached.

**(2) Description of the location and quality of surface and ground water at or adjacent to the mining operation and an analysis of the mining operation's impact on that surface and ground water**

The mine is located in the San Juan basin in the Ambrosia Lake district and the proposed permit area surrounds Ambrosia Lake.

Surface water

Surface water at the site is characterized as intermittent, with flows generally occurring only after heavier precipitation events. Surface water drains into Ambrosia Lake by unnamed ephemeral arroyos which constitute the principal drainage channels into Lake Ambrosia. The water is not used as a potable drinking source. Additional ponds within the vicinity of the proposed permitted area, all of which are usually dry, include mine ponds not currently in operation.

Mining will be designed and operated such that any disturbed areas do not contribute to suspended solids above background or to intermittent or perennial streams and other locations of surface water. Water quality should be regularly monitored to prevent localized contribution to TSS and TDS levels. Stockpile and waste areas will be designed and designated to a specific area of the mining field and any spoils excluding or material will be buried and capped. The designated spoil storage area will be cleared and re-graded to pre-existing conditions to no greater than a 3:1 ratio and covered with clean top soil. Following grading, all areas will be re-seeded.

Groundwater

Groundwater is reportedly encountered at a depth of 550 feet according to NMED records pertaining to a previous Section 3 Minimal Impact Exploration Permit Application submitted last decade. However, approximately 630 ft. depth to groundwater was measured during Sec 12 (SW ¼) shaft installation in mid-late 1970's and other Office of the State Engineer records show that depth to ground water with respect to historic mining operations closest to the proposed permitted area exceed 700 ft. *See* **Table. 2,** *attached*. The closest data point for ground water quality is in Section 17, approximately 2 miles from the Section 12 head frame and main shaft. **Figure 1** displays average regional TDS levels for Sections 17, 19, 24, 23, and 22.

Proposed mining operations do not involve any dewatering and the applicant intends to wait for market. Thus, stockpiling of any ore mined will be minimal, both as to quantity and duration. Given the approximate depth to ground water as discussed above, ground water impacts are not likely. Applicant is committed to construct a perimeter earthen berm around the operational mining area and stockpiles to prevent erosion from entering Ambrosia Lake and nearby arroyos such that possibility of erosion entering the aquifer is negated.

**(3) Description of the geologic regime beneath and adjacent to the mining operation.**

The geologic regime at the site includes the following strata in descending sequence: alluvium/weathered Mancos shale; the Tres Hermanos-C, -B, and –A sandstones; the Dakota formation; the West water Canyon Member of the Morrison formation; the Bluff Sandstone formation; and the Todilto Limestone formation.

**(4) Description of the piles and other accumulations of waste, tailings and other materials and an analysis of their impact on the hydrologic balance, drainages and air quality.**

Waste spoils at the site will be contained in a two acre staging area due east of the head frame. The surface pile at its maximum dimension will not exceed 1.5 acres (design limit) and will consist of coarse to fine grained sand and gravel-sized sandstone and bentonitic shale fragments.

Any ore stockpiled will be contained in the same storage area due east of the head frame and Lake Ambrosia. The stockpile surface of ore at its maximum dimension will not exceed 0.5 acres (design limit), and is expected to be utilized infrequently as mining will take place on market order and ore will be taken off site from the staging area. Thus any stockpiling of ore will be minimal, both as to quantity and duration.

Hydrologic Balance and Drainage Impacts

The Tres Hermanos sandstone formation immediately underlying the Mancos Shale was thought to have been unsaturated prior to mining. According to the *Ambrosia Lake Environmental Assessment Report* (DOE, 1987), the formation had a low water yield and produced poor-quality water and was not used as a regional groundwater source. Other than the DOE report, there is no groundwater data available to characterize the impact that mining had on the hydrologic balance.

Proposed operations are located nearby to unnamed ephemeral streams and Lake Ambrosia. The non-economical mine materials pile and other portions of the site are within the floodplain of Ambrosia Lake, but given the arid conditions, less than 11 inches of annual precipitation in the region, and frequently dry condition of the lake, impediment of natural flows due to mining operations is not likely.

Air Quality Impacts

The non-economical material pile is comprised of rock fragments and coarse-grained soils, limiting the amount of dust that can be generated. Seeding during mine reclamation will introduce vegetation, which will further reduce dust generation.

**(5) Analysis of the mining operation's impact on local communities.**

The mine, when it operated, contributed to the local economy. As the mine is currently not operating, there is no positive economic impact to the community. With respect to the immediate surrounding population, it is sparsely populated and includes land parcels designated non-taxable, BLM lands, and at least one other mining operation about ½ mile from the proposed permitted area. Navajo lands are about 3 miles west of the proposed permitted area. Given the small foot print, nature of proposed mining operations, depth to ground water, and environmental monitoring and reclamation activities that will be put in place on site, no adverse impact to human health, and the environment is likely due to operations.

**(6) Description of wildlife and wildlife habitat at and surrounding the mining operation and an analysis of the mining operation's impact on that wildlife and wildlife habitat.**

A wildlife survey for the region surrounding the Ambrosia Lake area was included in the DOE report. According to the wildlife survey presented in Appendix C of the DOE report, grassland and slope-cliff habitats are the principle habitats in the area. There are no threatened and endangered species in the vicinity of the site. However, several species may occasionally migrate through the site, including the peregrine falcon and the bald eagle.

Fauna and Signs of Fauna Observed in the Ambrosia Lake Area as listed in Tables 2.2 and C.1.2 of the 1987 DOE Report:

***Mammals (Common) (Scientific Name)***

Black-tailed jackrabbit/ Lepus californicus

Desert cottontail/ Sylvilagus auduboni

Coyote/ Canis latrans

***Birds (Common) (Scientific Name)***

Sharp-shinned hawk/ Accipiter striatus

Red tailed hawk/ Buteo jamaicensis

American kestrel/ Falco sparverius

Mourning dove/ Zenalda macroura

Northern flicker/ Colaptes auratus

Western kingbird/ Tyrannus verticulis

Say's phoebe/ Sayornis saya

Horned lark/ Eremophila alpestris

Cliff swallow/ Petrochelidon pyrrhonota

Scrub Jay/ Aphelocoma coerulescens

Pinyon jay/ Gymnorhinus cyanocephalus

Common raven/ Corvus corax

Bewick's wren/ Thryomanes bewickii

Rock Wren/ Salpinctes obsoletus

Mockingbird Mimus polyglottos

Loggerhead shrike/ Lanius ludovicianus

Western Meadowlark/ Sturnella neglecta

Brewer's blackbird/ Euphagus cyanocephalus

Lark sparrow/ Chondestes grammacus

Black-throated sparrow/ Amphispiza bilineata

***Reptiles (Common) (Scientific Name)***

Red-spotted toad/ Bufo punctatus

Side-blotched lizard/ Uta stansburiana

Short-horned lizard /Phrynosoma douglassi

Plateau whiptail/ Sceloporus undulatus consobrinus

***Wildlife Signs Noted (Common) (Scientific Name)***

Mule deer/ Odocoileus hemionus

Elk/ Cervus elaphus

Vegetation

The vegetation in the area of the site is typical of the arid desert environment. Plant species present in the area were determined during the making of 1987 DOE Report.

Species encountered in the Ambrosia Lake Area as listed in Tables 2.3 and C.1.1.1 of the 1987 DOE Report:

| *(Scientific Name) (Common Name)* | *(Scientific Name)(Common Name)* |
|---|---|
| Abronia sp./ Sandverbena | Muhlenbergia torreyi / Ring muhly |
| Agropyron smithii / Western Wheatgrass | Oenothera albicaulis / evening primrose |
| Aristida longiseta/ Red Threeawn | Oenothera pallida Pale/ evening primrose |
| Aristida purpurea/ Purple Threeawn | Oryzopsis hymenoides/ Indian Ricegrass |
| Artemisia nova/ Black Sagebrush | Penstemon sp./ Penstemon |
| Astragalus sp./ Milkvetch | Phacelia corrugata /Scorpion weed |
| Aster sp./ Aster | Phlox sp./ Phlox |
| Atriplex canescens/ Fourwing saltbrush | Plantago purshii/ Plantain |
| Atriplex confertifolia/ Shadscale | Psoralea lanceolata/ Scurfpea |
| Atriplex obovata/ Saltbush | Purshia tridentate/ Antelope bitterbrush |
| Bromus tectorum/ Cheatgrass | Rhus trilobata/ Skunkbrush sumac |
| Chrysothamnus nauseosus/ Rubber rabbitbrush | Rumex crispus/ Curly dock |
| Chrysothamnus viscidiflorus/ Green rabbitbrush | Sarcobatus vermiculatus/ Greasewood |
| Cowania Mexicana/ Cliff rose | Sisymbrium altissimum/ Tumble mustard |
| Cryptantha crassisepala/ Cat's eye | Sitanion hystrix/ Bottlebrush squirreltail |
| Dithyrea wislizenii/ Spectaclepod | Sphaeralcea parvifolia/ Globemallow |
| Ephedra torreyana Ephedra | Sporobolus airoides Alkali sacaton |
| Eriogonum sp./ Buckwheat | Sporobolus contractus/ Spike dropseed |

Euphorbia fendleri Spurge

Eurotia lanata/ Winterfat

Festuca octoflora/ Sixweek fescue

Gutierrezia sarothrae/ Snakeweed

Hordeum pusillum/ Little barley

Juniperus sp./ Juniper

Lactuca sp./ Wild lettuce

Lappula Sp./ Stickseed

Lycium pallidum Pale/ wolfberry

Sporobolus cryptandrus/ Sand dropseed

Sporobolus giganteus /Giant dropseed

Stipa comate/ Needle and thread

Stipa neo Mexicana/ Feathergrass

Suaeda torreyana/ Seepweed

Tridens pulchellus/ Fluffgrass

Verbesina encelioides/ Golden Crownsbeard

Yucca sp./ Yucca

Impact to wildlife and wildlife habitat

The impact of the mine on wildlife during active operations was minimal as a result of the mostly open land in the region. The total disturbance of the mine is expected to be negligible given the plan of operations and existing foot print of proposed operations that does not require new construction. Therefore the overall impact to wildlife and wildlife habitat will be minimal.

**(7) For existing mining operations, a description of the design limits for each unit, including waste units, impoundments and stockpiles and leach piles.**

(shaft diameters vary) (*see also* **Fig**. A-2)

Section 12 main shaft = 12'
Section 12 vent shaft (2) = 54"
Section 11 Dysart shaft = 10'
Section 11 vent shaft = 36"

Ore stockpile design limit= 0.5 acres (*see also* **Fig.** A.1)
Waste area design limit=1.5 acres
Staging area design limit=2.0 acres

# CLOSE OUT PLAN

On behalf of: Southwest Resources, Inc.
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Albuquerque, NM 87110
(505) 266-2500

Submitted to: Director,
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January, 2014

## TABLE OF CONTENTS

## 1.0 INTRODUCTION

The Closeout Plan (Plan) for Southwest Resources , Inc.'s (Southwest) Section 11 and 12 existing mine known as the Ambrosia Lake Mine has been prepared in compliance with the requirements of NMAC 19.10.5.506. The Plan is based on available data. The Plan was prepared using the NM EMNRD (MARP) document entitled *Closeout Plan Guidelines.*

Section 1 of the Plan discusses the project site including soils, geology, surface and groundwater and post-mining land use. Section 2 describes the components of the Closeout plan. Section 3 provides a description of gamma radiation level surveys. Section 4 provides a Financial Assurance Cost estimate and detailed reclamation sequence and plan. Section 5 details the Closeout Plan schedule.

## 1.1 PROJECT DESCRIPTION AND BACKGROUND

The uranium mine is located in the Southwest quarter, Section 12, 14 N, R 10 W and Section 11, south half, NE quarter quarter, Township 14 N R 10 W, McKinley County. It is commonly known as the Ambrosia Lake Mine, which is an existing mine. This mine is an underground uranium mine that operated in 1959 and 1962 and from 1974-1982. Mining operations are currently inactive. The total operating area is 15 acres more or less. *See* **Fig. 1**—Sec. 7.0.

The mine is located in the San Juan basin in the Ambrosia Lake district. The main shaft, storage area, staging area and main surface activities of the mine occur in a compact area of about 12 acres to the east of Ambrosia Lake.

Southwest is the surface and mineral estate owner of the mining operations area.

Features of the mining operation include two vent shafts, one escape shaft, one main shaft, one small stock pile area, one small staging area, staging area, and one small non-economic waste area consisting of coarse to fine grained sand and gravel-sized sandstone and bentonitic shale fragments. *See* **Fig**. A.2—Sec. 7.0.

## 1.2 SITE SOILS AND GEOLOGY

Soils

Native soils on site consist of silt, slightly clayey sands. Soils in the non-economic storage area will consist of coarse to fine grained sand and gravel-sized sandstone and bentonitic shale fragments. The ore stockpile will consist of gray-colored medium to coarse-grained sands with cobbles and gravels.

Geology

The geologic regime at the site includes the following strata in descending sequence: alluvium/weathered Mancos shale; the Tres Hermanos-C, -B, and –A sandstones; the Dakota

formation; the Westwater Canyon Member of the Morrison formation; the Bluff Sandstone formation; and the Todilto Limestone formation.

## 1.3 SURFACE WATER AND GROUNDWATER

Surface water

Surface water at the site is characterized as intermittent, with flows generally occurring only after heavier precipitation events. Surface water drains from unnamed arroyos into Ambrosia Lake.. The water is not used as a potable drinking source. Additional ponds within the vicinity of the proposed permitted area, all of which are usually dry, include mine ponds not currently in operation.

Groundwater

Groundwater is reportedly encountered at a depth of 550 feet according to NMED records pertaining to a previous Section 3 Minimal Impact Exploration Permit Application submitted last decade. However, approximately 630 ft. depth to groundwater was measured during Sec 12 (SW ¼) shaft installation in mid-late 1970's and other Office of the State Engineer records show that depth to ground water with respect to historic mining operations closest to the proposed permitted area exceed 700 ft. *See* **Table 2**—Sec. 7.0. The closest data point for ground water quality is in Section 17, approximately 2 miles from the Section 12 head frame and main shaft. **Figure 1**—Sec. 7.0 (displays average regional TDS levels for Sections 17, 19, 24, 23, and 22).

## 1.4 POST-MINING LAND USE

Reclamation is designed to accommodate grazing for livestock and native wildlife.

## 1.5 VEGETATION AND WILDLIFE

Vegetation

The vegetation in the area of the site is typical of the arid desert environment. Plant species present in the area were determined during the making of *Ambrosia Lake Environmental Assessment Report* (DOE, 1987). According to the study, none of the taxa constitutes protected species, species of concern, or noxious weeds by statute or regulation.

Species encountered in the Ambrosia Lake Area as listed in Tables 2.3 and C.1.1.1 of the 1987 DOE Report:

| *(Scientific Name) (Common Name)* | *(Scientific Name)(Common Name)* |
|---|---|
| Abronia sp./ Sandverbena | Muhlenbergia torreyi / Ring muhly |
| Agropyron smithii / Western Wheatgrass | Oenothera albicaulis / evening primrose |
| Aristida longiseta/ Red Threeawn | Oenothera pallida Pale/ evening primrose |
| Aristida purpurea/ Purple Threeawn | Oryzopsis hymenoides/ Indian Ricegrass |
| Artemisia nova/ Black Sagebrush | Penstemon sp./ Penstemon |
| Astragalus sp./ Milkvetch | Phacelia corrugata /Scorpion weed |

Aster sp./ Aster
Atriplex canescens/ Fourwing saltbrush
Atriplex confertifolia/ Shadscale
Atriplex obovata/ Saltbush
Bromus tectorum/ Cheatgrass
Chrysothamnus nauseosus/ Rubber rabbitbrush
Chrysothamnus viscidiflorus/ Green rabbitbrush
Cowania Mexicana/ Cliff rose
Cryptantha crassisepala/ Cat's eye
Dithyrea wislizenii/ Spectaclepod
Ephedra torreyana Ephedra
Eriogonum sp./ Buckwheat
Euphorbia fendleri Spurge
Eurotia lanata/ Winterfat
Festuca octoflora/ Sixweek fescue
Gutierrezia sarothrae/ Snakeweed
Hordeum pusillum/ Little barley
Juniperus sp./ Juniper
Lactuca sp./ Wild lettuce
Lappula Sp./ Stickseed
Lycium pallidum Pale/ wolfberry
Phlox sp./ Phlox
Plantago purshii/ Plantain
Psoralea lanceolata/ Scurfpea
Purshia tridentate/ Antelope bitterbrush
Rhus trilobata/ Skunkbrush sumac
Rumex crispus/ Curly dock
Sarcobatus vermiculatus/ Greasewood
Sisymbrium altissimum/ Tumble mustard
Sitanion hystrix/ Bottlebrush squirreltail
Sphaeralcea parvifolia/ Globemallow
Sporobolus airoides Alkali sacaton
Sporobolus contractus/ Spike dropseed
Sporobolus cryptandrus/ Sand dropseed
Sporobolus giganteus /Giant dropseed
Stipa comate/ Needle and thread
Stipa neo Mexicana/ Feathergrass
Suaeda torreyana/ Seepweed
Tridens pulchellus/ Fluffgrass
Verbesina encelioides/ Golden Crownsbeard
Yucca sp./ Yucca

Wildlife

A wildlife survey for the region surrounding the Ambrosia Lake area was included in the DOE report. According to the wildlife survey presented in Appendix C of the DOE report, grassland and slope-cliff habitats are the principle habitats in the area. There are no threatened and endangered species in the vicinity of the site. However, several species may occasionally migrate through the site, including the peregrine falcon and the bald eagle.

Fauna and Signs of Fauna Observed in the Ambrosia Lake Area as listed in Tables 2.2 and C.1.2 of the 1987 DOE Report:

***Mammals (Common) (Scientific Name)***
Black-tailed jackrabbit/ Lepus californicus
Desert cottontail/ Sylvilagus auduboni
Coyote/ Canis latrans

***Birds (Common) (Scientific Name)***
Sharp-shinned hawk/ Accipiter striatus
Red tailed hawk/ Buteo jamaicensis
American kestrel/ Falco sparverius
Mourning dove/ Zenalda macroura
Northern flicker/ Colaptes auratus
Western kingbird/ Tyrannus verticulis
Say's phoebe/ Sayornis saya

Horned lark/ Eremophila alpestris
Cliff swallow/ Petrochelidon pyrrhonota
Scrub Jay/ Aphelocoma coerulescens
Pinyon jay/ Gymnorhinus cyanocephalus
Common raven/ Corvus corax
Bewick's wren/ Thryomanes bewickii
Rock Wren/ Salpinctes obsoletus
Mockingbird Mimus polyglottos
Loggerhead shrike/ Lanius ludovicianus
Western Meadowlark/ Sturnella neglecta
Brewer's blackbird/ Euphagus cyanocephalus
Lark sparrow/ Chondestes grammacus
Black-throated sparrow/ Amphispiza bilineata

***Reptiles (Common) (Scientific Name)***
Red-spotted toad/ Bufo punctatus
Side-blotched lizard/ Uta stansburiana
Short-horned lizard /Phrynosoma douglassi
Plateau whiptail/ Sceloporus undulatus consobrinus

***Wildlife Signs Noted (Common) (Scientific Name)***
Mule deer/ Odocoileus hemionus
Elk/ Cervus elaphus

## 1.6 CULTURAL RESOURCES

No cultural resources have been identified at the mine site to date. Cultural resources requiring protection, including any cemeteries or burial grounds, shall be protected and/or avoided during mining and reclamation activities whenever encountered and where possible. A detailed protocol regarding any identification of cultural resources is discussed in Sec. 4.0, *infra.*

## 2.0 CLOSEOUT PLAN COMPONENTS

This Closeout was prepared following the guidelines presented in the document *Closeout Plan Guidelines for Existing Mines* (MARB, 1996) that are part of the MARP. Components of the Plan are intended to reclaim the Ambrosia Lake Mine located in Sections 11 and 12 to post-mining use of livestock grazing that would also be consistent with future mining. The general components of the Plan include the following:

- Grade and contour site to pre-existing conditions, backfill areas of excavation
- Headframe demolition and removal
- Seal vents and shafts
- Building demolition and removal
- Remove stockpiled ore
- Bury waste spoils
- Revegetate all disturbed areas

## 2.1 EROSION CONTROL

Erosion from the Site will be controlled by re-contouring the site to pre-existing conditions, utilizing available top soil on site, and vegetating with native species available in an approved mix . *See* **Fig**. A-4; **Table 3**.

As a precaution to prevent infiltration, the area near the Section 12 Mine Shaft and headframe will be reclaimed so as to maintain a higher grade. (**Figure** A-4).

Because the mine was previously operational, Mr. James Smith of the MMD stipulated that additional contingency cost should be included in the financial assurance calculation (Ashley Arrossa, INTERA Inc., personal communication, February 1, 2013) to include:

1. The re-engineering of Site Grading, and
2. An accurate , complete topographical survey.

Re-engineering of the Site may include, but is not limited to soil characterization, grading and drainage planning, and storm water prevention planning. In any case, a topological survey for the Site will be necessary to accurately design these items when reclamation for the mine begins.

Reclamation is designed in such a manner that the disturbed area does not contribute to suspended solids above background levels to intermittent and perennial streams. Water quality should be regularly monitored to prevent localized contribution to TSS and TDS levels.

## 2.2 REGRADING AND COVERS

### 2.2.1 Non-economic storage area

Waste spoils (earth, dirt, rock, and stone---separated from uranium deposits) have been, and will continue to be, designated to a specific area of the mining field. Of the two acres dedicated to material handling, 1.5 acres is dedicated to the storage of non-economic spoils.

In reclaiming the non-economic storage area, spoils will be buried and capped according to Figure A-4.

The designated spoil storage area will be cleared, re-graded to pre-existing conditions no greater than 3:1 and covered with clean top soil, and re-seeded with specified mix . **Table** 3.

### 2..2.2 Equipment storage area

After demolition of a fence surrounding the equipment storage area, all metal, rubber (tires), any oil/liquid, wood, concrete, salvageable equipment, would be separated and hauled off site for

appropriate disposal or storage. A Gallup landfill and metal handling facilities in Albuquerque are the closest locations for disposal or recycling.

The Equipment storage area will be cleared, re-graded to pre-existing conditions no greater than 3:1 and covered with clean top soil, and re-seeded with specified mix.

### 2.2.3 Ore stockpile

The Site is an underground mine that has operated in 1959 and 1962 and from 1974-1982. Mining has ceased at the site, but is prepared for future mining, upon approval. All ore stockpiled on the designated area of one-half acre will be removed and delivered as purchased. At close out, ground surface will be cleared, graded, and re-seeded to pre-existing conditions.

### 2.2.4 staging area

The staging area, which encompasses 2 acres will be cleared, graded and re-seeded to pre-existing conditions after removal/disposal of materials, buildings, structures, and equipment in the operating area.

An area near the Section 12 head frame and main shaft was graded to a higher relief during construction of above ground facilities. Reclamation would preserve the elevation as a precaution to prevent infiltration, more specifically identified and described in **Fig.** A-4.

## 2.3 HEAD FRAME DEMOLITION

Dismantle with torches and impact tools and remove with appropriate crane and metal handling equipment. Metal hauled offsite for disposal.

## 2.4 REMAINING VENTS AND SHAFTS DEMOLITION

The general demolition procedure would consist of removing the elevator platforms and securing the shaft, placing any down-hole material excluding ore (spoils) down the shaft at a slow pace, installing PUF, a cement slurry, and topsoil cover to the void space, then razing the head-frames, and dismantling with cutting torches and impact tools.

The spoils would be backfilled to a depth not exceeding that of twice the diameter of the respective shaft. PUF would be installed to within 12 feet below ground surface. As per the Guidance Document for Part 5 Permitting under the *New Mexico Mining Act* (October 2011), a 10 ft. layer of cement slurry is to be installed as a part of the backfill process. Topsoil would be backfilled for grading and seeding purposes to the surface (2 ft.) and allowed to settle without compaction. The reclamation process may need to be re-assessed should the cement slurry and 2-ft. topsoil layer prevent proper radiation reclamation. *See* **figure A-2** Typical Shaft Diagram

## 2.5 BUILDING DEMOLITION

Buildings at the site include an office building, a shed, and a maintenance building. The maintenance and office buildings and associated work pad, which are located on private property, may be used post-mining as facilities for a local ranching operation.

In the alternative, materials, including those stored in the buildings, would be separated for disposal or salvage and moved off site. Foundations, concrete, and structures associated with the buildings, including electrical supply, would also be dismantled, separated, and moved off site if necessary,

## 2.6 REVEGETATION

Once above surface facilities and materials of the mine have been dismantled and hauled off site or designated for a post mining use, top soil will be distributed evenly on the Site surface. The Site surface will then be graded to natural topography except for an area near the Section 12 headframe and shaft, which will be reclaimed to maintain a higher grade at the shaft to prevent infiltration.

Topsoil may be removed during clearing and grubbing, but will be placed in a stockpile for re-distribution. Topsoil will not be removed from the site and will be used only for the re-establishment of vegetation. No soil amendments will be used.

The surface will then be scarified to retain moisture and allow for seed capture.

A seed mix specific to Section 11 and 12 will be used. The application rate will be approximately 17 pounds/acre.

The mix to be used includes:

Western wheatgrass
Alkalai Sacaton
Blue Grama
Galleta
Thickspike Wheatgrass
Indian Ricegrass
Sideoats
Gramma
Bottlebrush
Squirreltail
Desert Globe mallow
Palmer Pensetmon
Blue Flax
Four-wing Saltbrush
Winter Fat

## 2.7 REGULATORY COMPLIANCE

No other permits applicable.

## 2.8 SITE ACCESS CONTROL AND FENCING

Surface and mineral rights of the Ambrosia Lake Mine are privately owned. Road entry will be gated with proper signage against unauthorized entry. A portion of the area, if possible, will be left accessible for local cattle to graze in accordance with local ranchers' requests.

# 3.0 RADIOLOGICAL SURVEYS

Radiological Reclamation

Uranium exploration reclamation involves cleaning all drill hole locations and associated disturbances up to the background gamma radiation levels. Gamma radiation levels should be surveyed following abandonment of the drill hole (vent shaft). In the event that background radiation levels cannot be replicated by using a stable three foot cover, for good cause, the regulatory agencies may re-assess closeout options.

Because exploration has previously occurred at the site and surrounding areas, it is necessary to perform a current radiation survey. As a result of communication with MMD engineer Mr. James Smith, a gamma radiation survey was performed on February 12, 2013 (Ashley Arrossa, INTERA Inc. personal communication, February 1, 2013). The goal of the survey was to obtain radiation levels as a basis of comparison for future reclamation activities. The survey was conducted according to methodology stated in the Guidance Document for Part 3 Permitting under the New Mexico Mining Act (October 2011) as follows:

*"All measurements should be taken with a Ludlum Model 19, or similar gamma radiatio n measuring device. Readings should be taken one (1) meter above the ground at the staked drill hole location and at any proposed pit locations."*

Additionally, the survey was conducted in an effort to delineate elevated radiation levels throughout the Site at the Section 12 Main Shaft and Headframe, Section 12 Vents (2), Dysart II Shaft and Headframe, Section 11 Vent, and Workers' Quarters area. Results from a previous ground radiation survey performed by the EPA at the Section 12 Main Shaft and Headframe and Dysart II Shaft and Headframe delineated elevated radiation levels to the north, west, and south of the Section 12 Main Headframe, but not to the east. Elevated radiation levels were not delineated in the area near the Dysart II Shaft and Headframe.

Results of Gamma Survey

Complete results for the INTERA Inc. gamma radiation survey can be found in Table A-2. It was noted that areas with more erosion demonstrated higher relative levels of gamma radiation near the Dysart II shaft and the Section 11 Vent shaft. Gamma radiation levels ranged from 10 – 380

μR/hr throughout the entire Site. General radiation level patterns for each sampling location are discussed in the subsection below.

Section 12 Main Shaft and Headframe

Radiation levels were surveyed at the Headframe and in 20 ft intervals radiating in the four cardinal directions as shown on Figure A-3. The radiation level at the Shaft measured at 45 μR/hr. Based on results from the previous EPA survey, the survey extended 100' to the north, west, and south, and 500' to the east. Two "field-background" levels were obtained at 600' and 700' to the east. The two background levels were 50 and 30 μR/hr, respectively. Radiation levels ranged from 30 – 300 μR/hr, with the highest result existing 80' to the west.

Section 12 Vent Shaft (East)

Radiation levels were surveyed at the Vent Shaft and in 20 ft intervals radiating in the four cardinal directions to a distance of 100' from the shaft as shown on Figure A-4. The radiation level at the Shaft measured at 20 μR/hr. Radiation levels ranged from 10 – 20 μR/hr, with the highest results existing up to 20' from the Shaft.

Section 12 Vent Shaft (West)

Radiation levels were surveyed at the Vent Shaft and in 20 ft intervals radiating in the four cardinal directions to a distance of 100' from the shaft as shown on Figure A-4. The radiation level at the Shaft measured at 380 μR/hr. Radiation levels ranged from 15 – 25 μR/hr, with the highest results existing up to 20' from the Shaft.

Dysart II Shaft and Headframe

Radiation levels were surveyed at the Headframe and in 20 ft intervals radiating in the four cardinal directions to a distance of 300' as shown on Figure A-5. The radiation level at the Shaft measured at 200 μR/hr. In general, radiation levels increased with distance up to 100', decreased with distance up to 220', then increased with distance up to 280', Due to this trend, an additional reading was measured at 290' to the north. Radiation levels ranged from 20 – 230 μR/hr, with the highest result existing 290' to the north.

Section 11 Vent Shaft

Radiation levels were surveyed at the Vent Shaft and in 20 ft intervals radiating in the four cardinal directions to a distance of 200' from the shaft as shown on Figure A-6. The radiation level at the Shaft measured at 110 μR/hr. Radiation levels ranged from 45 – 250 μR/hr, with the highest results existing up to 20' from the Shaft.

Workers' Quarters

Radiation levels were surveyed at the Workers' Quarters at the 8 locations shown in Figure A-7. These locations were chosen near structures and along the perimeter of the area. The gamma

radiation level remained stable throughout the survey at 1- μR/hr.

## 4.0 FINANCIAL ASSURANCE COST ESTIMATE

### 4.1 INTRODUCTION

The Financial Assurance Estimate is based on third-party cost to complete all aspects of reclamation to include re-grading waste and stockpiles, demolition of all structures, removal of all waste, plugging of the shafts and vent holes, ripping and seeding the roads, and re-vegetation of the reclaimed Site. ( *See* **Table 4**.)

The Site is relatively compact with a disturbed area of about 15 acres. Presently, operation of the mine has been determined to have no direct surface impact on wetlands, spring, perennial or intermittent streams, lakes, rivers, reservoirs or riparian areas. The Site is not designated to be in critical habitat areas as determined in accordance with the federal *Endangered Species Act* of 1973 or in areas determined by the Department of Game and Fish likely to result in an adverse impact on an endangered species designated in accordance with the *Wildlife Conservation Act*, Sections 17-2-37 through 17-2-46 NMSA 1978 or by the State Forestry Division for the *Endangered Plants Act*, section 75-6-1 NMSA 1978. The Site is not located in an area with cultural resources listed on either the National Register of Historic Places or the State Register of Cultural Resources. Additionally, mining or closeout activities are not anticipated to result in a direct impact on ground water. Historically, the site has not been used for heap leaching or dump leaching, nor is it a source expected to result in point or non-point surface or sub-surface release of acid or other toxic substances or other toxic substances.

Mining and reclamation is designed and operated in such a manner that disturbance is minimal. . Cultural resources requiring protection, including any cemeteries or burial grounds, shall be protected and/or avoided during mining and reclamation activities whenever possible. Any potential interaction with cultural resources will be avoided to prevent impacts to historic properties. A historic property is any prehistoric or historic site eligible to the NRHP or unevaluated cultural resources .Roads and Project facilities would be sited as much as possible to avoid cultural resource impacts. If avoidance is not possible or is not adequate to prevent adverse effects, NMCC would undertake data recovery from such sites. Development of a treatment plan, data recovery, archeological documentation and report preparation would be based on the Secretary of the Interior's "Standards and Guidelines for New Mexico Copper Corporation Permit Application Package – Copper Flat Project Mine Operation and Reclamation Plan 63 July 18, 2012 Archeology and Historic Preservation," 48 CFR § 44716 (September 29, 1983), as amended or replaced. If an unevaluated site could not be avoided, additional information would be gathered and the site would be evaluated. If the site does not meet eligibility criteria as defined by the New Mexico SHPO, no further cultural work would be performed. If a site meets eligibility criteria, a data recovery plan or appropriate mitigation would be completed.

Prior to commencement of construction an archaeologist will be onsite to issue clearances for construction activities and to provide guidance and expertise to ensure the protection of cultural

properties. The appropriate agency will be notified immediately if additional cultural sites are discovered during these activities. Mitigation strategies will be developed in consultation with the agency.

## 4.2 COST ESTIMATING METHODOLOGY

The *MMD Guidance to Mine Operators for Calculating Reclamation Costs in Net Present Value,* December, 2004 was used for cost estimate.

## 4.3 RECLAMATION SEQUENCE

Since the Site is expected to presents no adverse impact to cultural or environmental resources, applicant proposes a three year period to complete the reclamation sequence after cessation of all mining activity in order to use applicant's on-site equipment and labor to significantly reduce expenditure vis-a-vis a third party cost.

A general concept of the reclamation activities was formulated to develop financial assurance calculations. Reclamation of the Sections 11 and 12 mine sites would be divided into four phases:

1. Mobilization and demobilization,
    a. Transportation of materials off-site
    b. Bury spoils and safeguard
2. Tear down of Buildings

a. office building
b. maintenance building
c. storage shed

3. Demolition, including,
    a. Dysart II Head-frame
    b. Remaining vents
    c. Main shaft and head frame

4. Site grading and reseeding.

In the unlikely event, applicant is not able to complete the reclamation sequence, it is estimated that the conservative and robust cost estimate at A-1 would allow a third party to complete reclamation at the Site in six weeks.

## 4.4 COST ESTIMATES

The reclamation activities are estimated at $213,812.50 (2019 dollars adjusted for 3 % i = $255,313.51) (*See* **Table 4**.) including the cost for mobilization, demolition, and site grading/seeding as outlined in the General Reclamation Narrative. Because the mine was

previously operational, Mr. James Smith of the MMD stipulated that additional contingency costs for the following items should be included in the financial assurance calculation (Ashley Arrossa, INTERA Inc. personal communication, February 1, 2013):

1. The re-engineering of Site grading, and
2. An accurate, complete topographical survey.

These items have been assumed to cost $32,582.12 and $21,721.41, respectively, for a grand total of $271,778. Re-engineering of the Site may include, but is not limited to soil characterization, grading and drainage planning, storm-water pollution prevention planning. As such, a topological survey for the Site will be necessary to accurately design these items. These items would need to be completed when reclamation for the mine begins. Detailed cost estimates can be found on Table 4.

### 4.5 COST ESTIMATE CONFIDENCE

The Scope of work presented in the Plan provides the basis for the reclamation cost estimate. The reclamation costs are prepared based on industry-wide standards applicable to the local area and are conservative estimates. The Plan provides the estimate cost and supporting documentation for a third party to reclaim the Ambrosia Lake mine in the unlikely event of forfeiture.

A high level of confidence accompanies the proposed reclamation such that a third party contractor or Ambrosia Lake Mine applicant could complete the reclamation at or below the cost estimated provided at A-1.

The cost estimate was prepared for financial assurance purposes and is reasonably conservative. Actual construction costs may be lower.

## 5.0 NOTARIZED STATEMENT OF APPLICANT

## 6.0 REFERENCES

## 7.0 FIGURES AND TABLES

Pursuant to NMAC 19.10.5.506 (J) (6)

I certify that I agree to comply with the reclamation standards and performance requirements of the permit, 19.10 NMAC, and the Act, and allow the Director to enter the permit area without delay for the purpose of conducting inspection during mining and reclamation.

**Signature of applicant:** George Lotspeich

**Printed name of Applicant:** George Lotspeich

**Title/Position:** Owner/President/intended agent for service of process

**Date:**

The foregoing application was personally acknowledged before me this 29th day of January, 2014 by George Lotspeich.

**STATE OF NEW MEXICO** )
)ss.
**COUNTY OF BERNALILLO** )

Witness my hand and official seal.

Notary Public

My commission expires: 8/11/14

(seal)

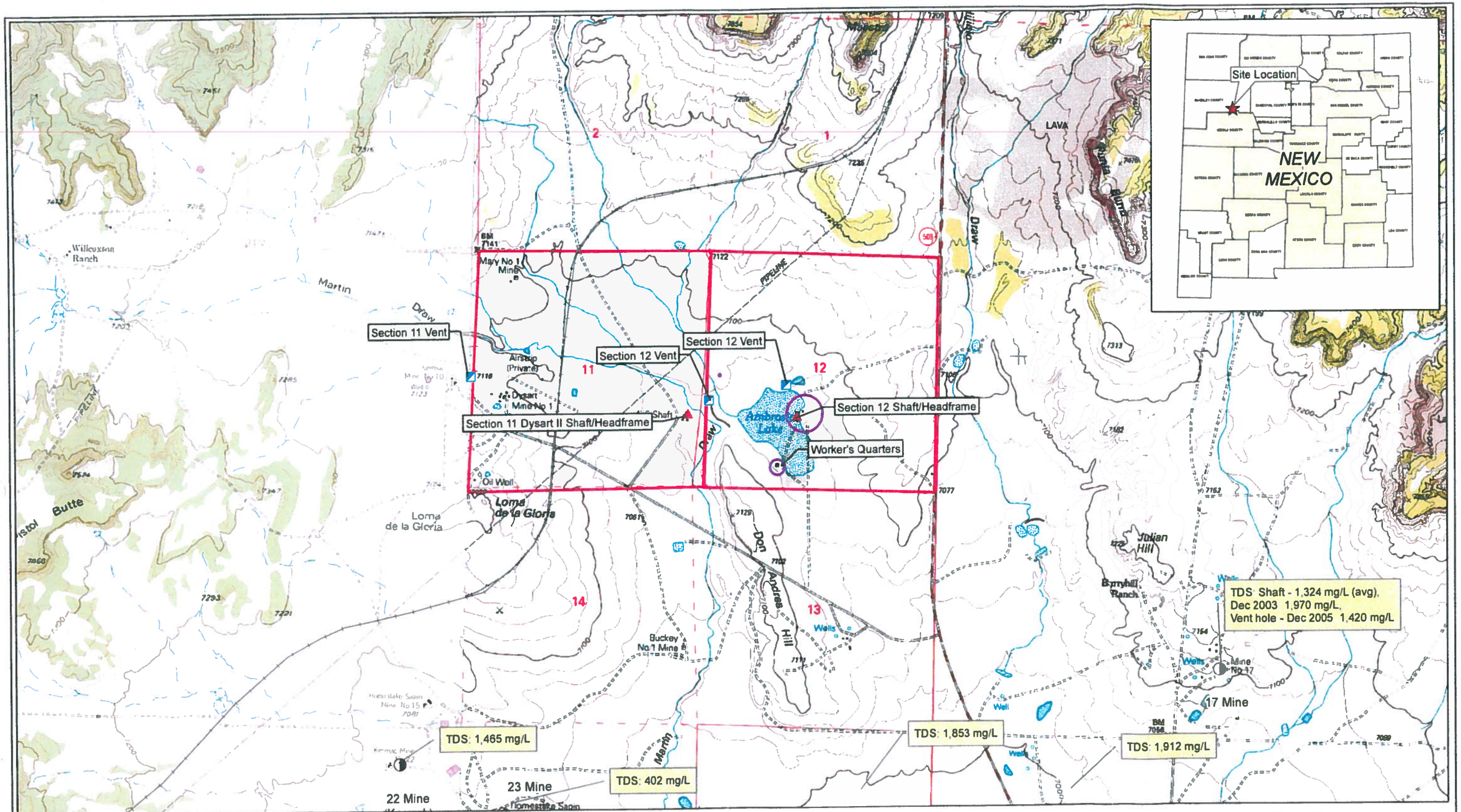
OFFICIAL SEAL
Jeanne Cameron Washburn
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 8/11/14

## 6.0 REFERENCES

*Environmental Assessment of Remedial Action at the Ambrosia Lake Uranium Tailing Site, Ambrosia Lake, New Mexico*, United States Department of Energy (DOE) 1987.

*Pre-CERCLIS Screening Assessment of the Dysart # 2 Mine*, New Mexico Office of the State Engineer, August 4, 2010.

*Subpart 3 Minimal Impact New Mining Operations Application for Permit in re: Southwest Resources, Inc. (George Lotspeich),* Intera, March 8, 2013.




Sources:
Mines/shafts (Sections 17, 22, 23) – Survey by WHPacific, 2011.
USGS Topographic Maps: Ambrosia Lake, Quadrangles, 1980;
Contour Interval 20 Feet Total Dissolved Solids (TDS) concentratons:
NMED Mine Water Database. Approximate locations inferred from Section identified.
Concentrations were averaged based on location.

Legend

- Vent Hole Location
- Shaft Location
- Area Mine Location
- Railroad
- Distrubed Areas = 15 acres
- Proposed Permit Area

Figure 1
Site Location Map
Southwest Resources, Inc.

S:\Projects\SouthwestResources_Lotspeich_Sections_11and12\Graphics\maps\SWR_figure1.mxd

**SOUTHWEST RESOURCES SOUTHWEST QUARTER OF SECTION 12, 14N 10W SHOWING SHAFT AND BUILDINGS AT 7,499 FEET.**

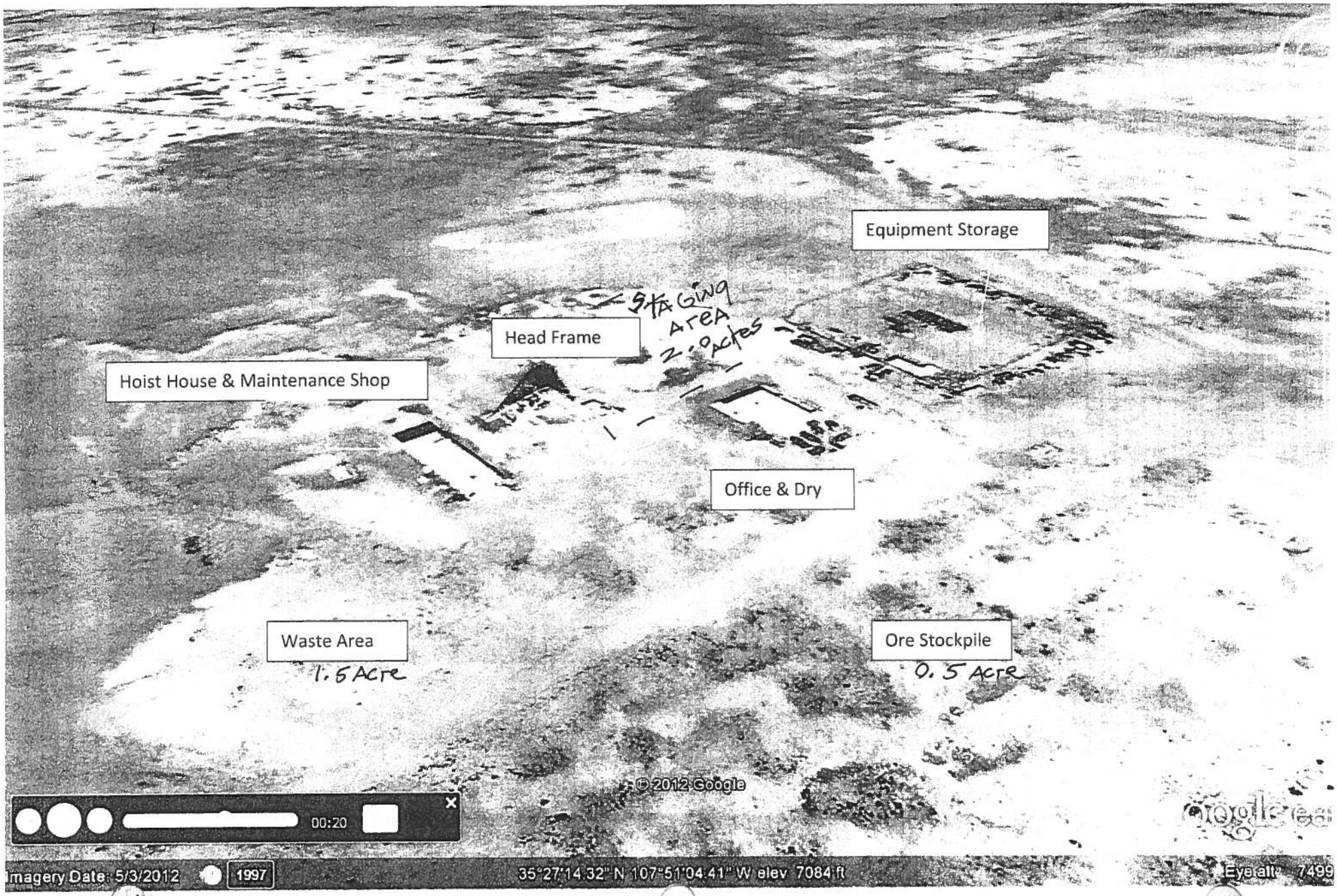
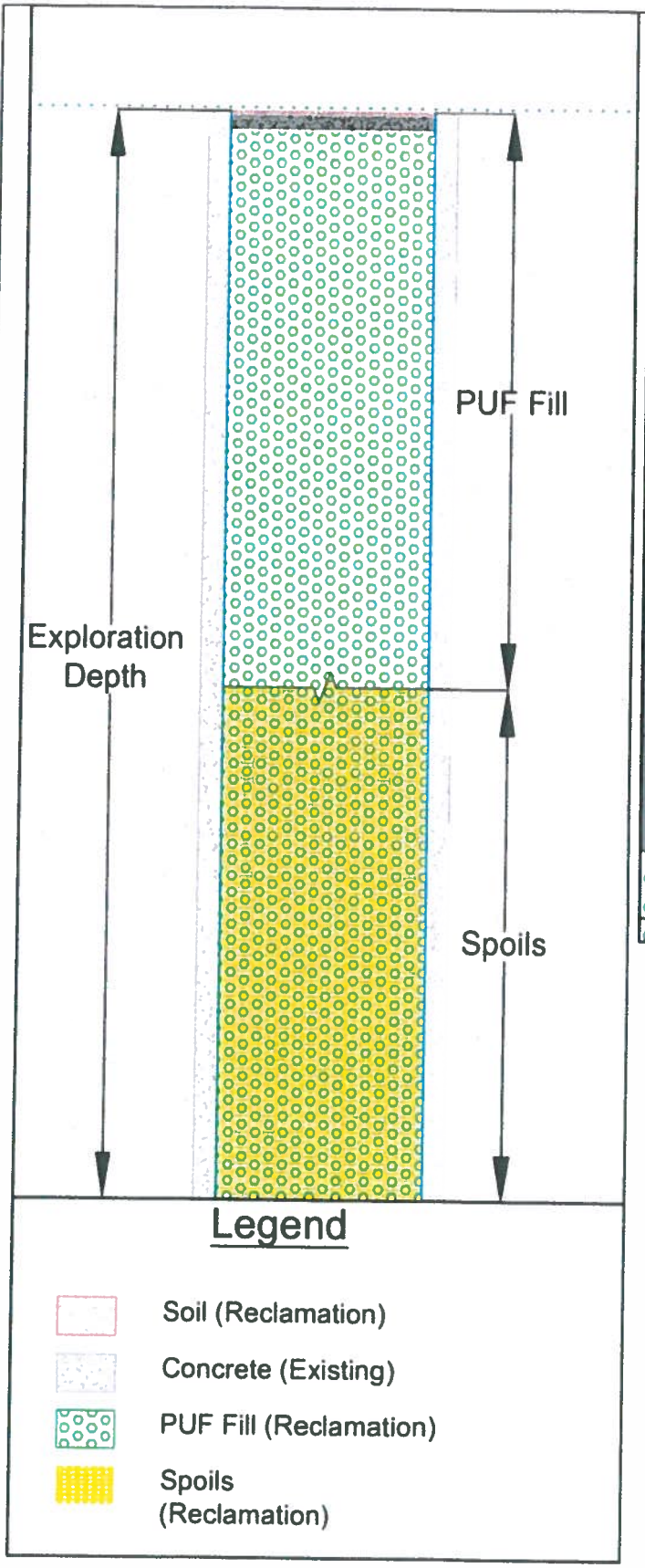
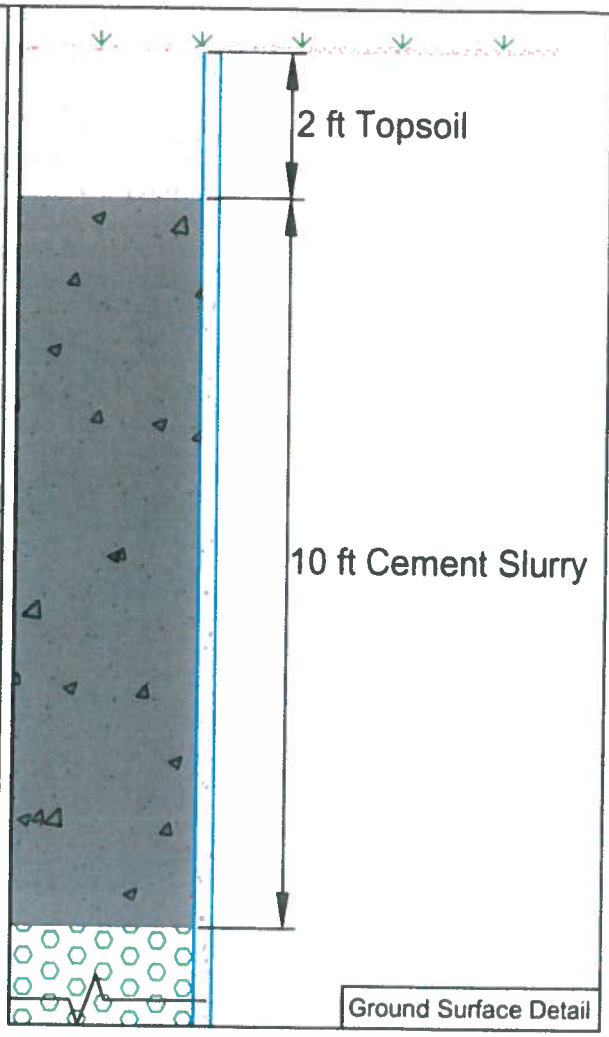



figure A-1




## Legend

- Soil (Reclamation)
- Concrete (Existing)
- PUF Fill (Reclamation)
- Spoils (Reclamation)

## Notes

1. Shaft diameter varies:
   - Section 12 Main Shaft = 12'
   - Section 12 Vent Shafts (2) = 54"
   - Section 11 Dysart Shaft = 10'
   - Section 11 Vent Shaft = 36"
2. Exploration/Depth to Station = 589'
3. PUF fill installed to a depth 2x diameter or to 2 ft bgs
4. Spoils will not exceed a depth of 2x diameter
5. Spoils defined as down-hole material excluding ore
6. Horizontal scale = 25x

Source(s): Guidance Document for Part 3 Permitting under New Mexico Mining Act (October, 2011)

SCALE
90 0 45
FEET

# Figure A-2
# Typical Shaft Diagram

Southwest Resources, Inc.

# SOUTHWEST RESOURCES – SHAFT ON SOUTHEAST CORNER, SECTION 11. 14N, 10W

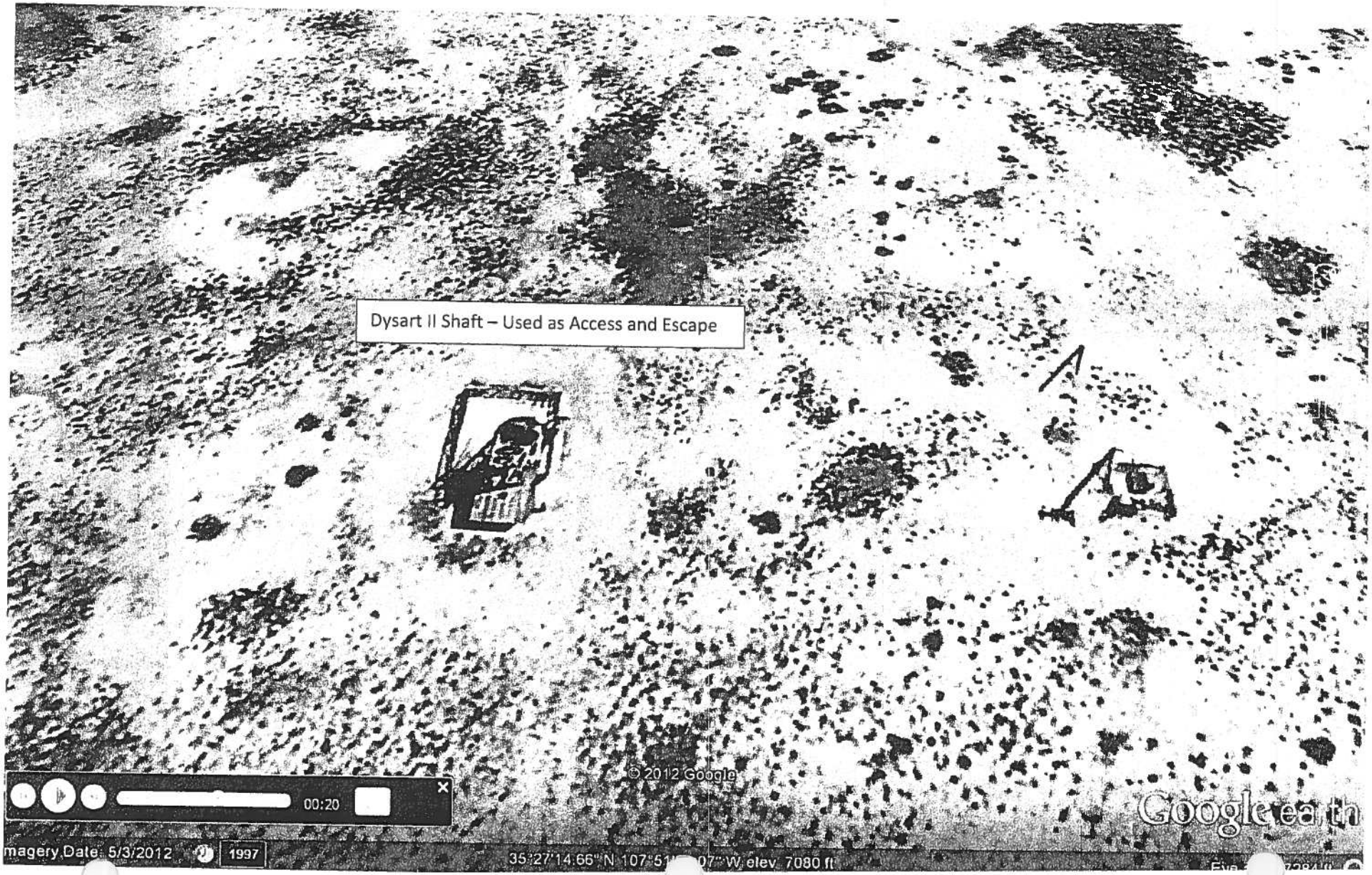
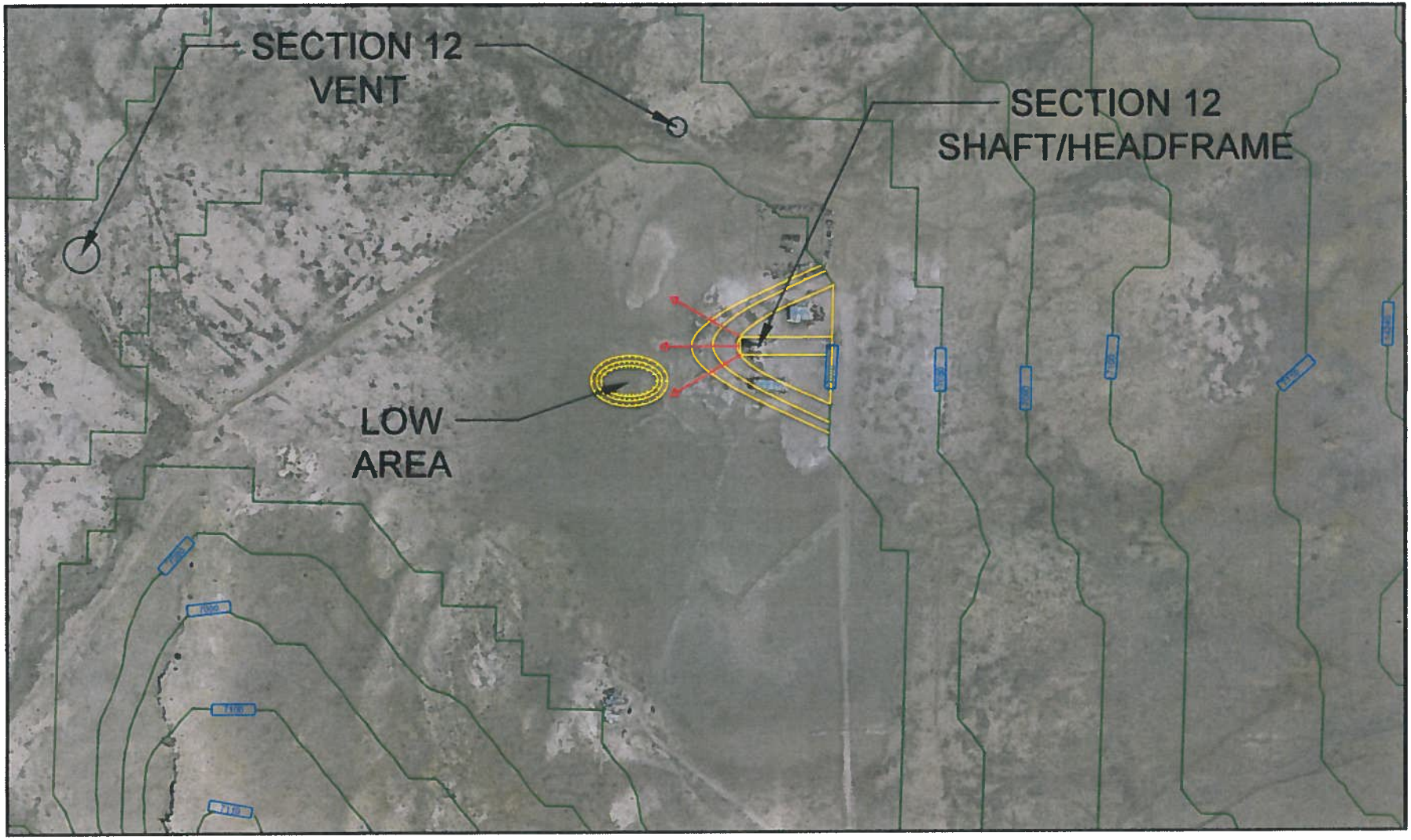



figure A-3




LEGEND

7100 EXISTING CONTOUR INTERVAL (10 FOOT)

PROPOSED GRADING

SLOPE DIRECTION

SCALE

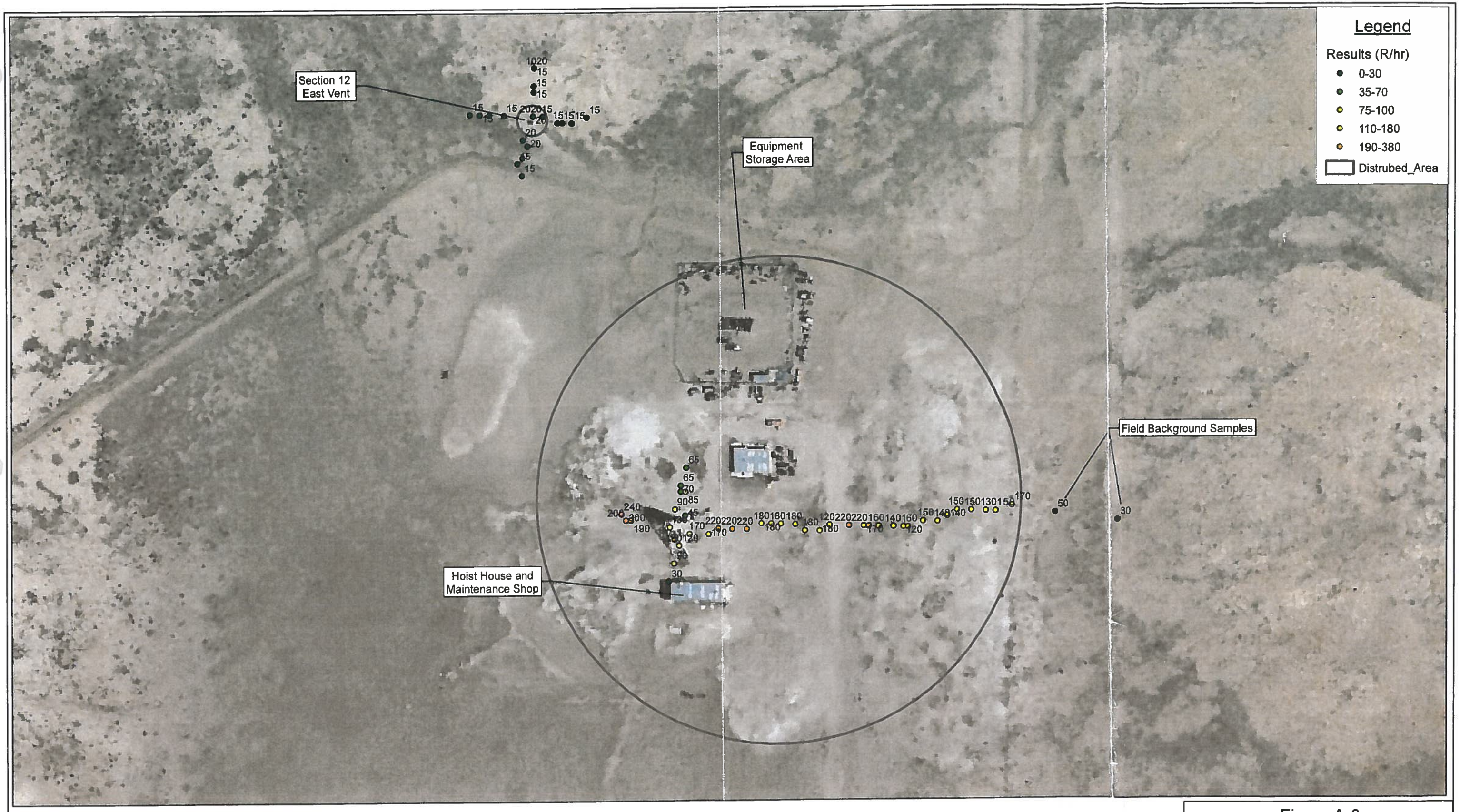
1 0 0.5

MILES

Source: USGS DEM
Note: Low Area assumed to be approximately 7065 ft AMSD

Figure A-4
Conceptual Reclamation Grading Plan

Southwest Resources, Inc.




Sources:
Aerial – RGIS website, dated 2011; GoogleEarth, dated 2012
Mines/shafts – Gamma Radiation Survey conducted by INTERA Inc. on February 12, 2013.

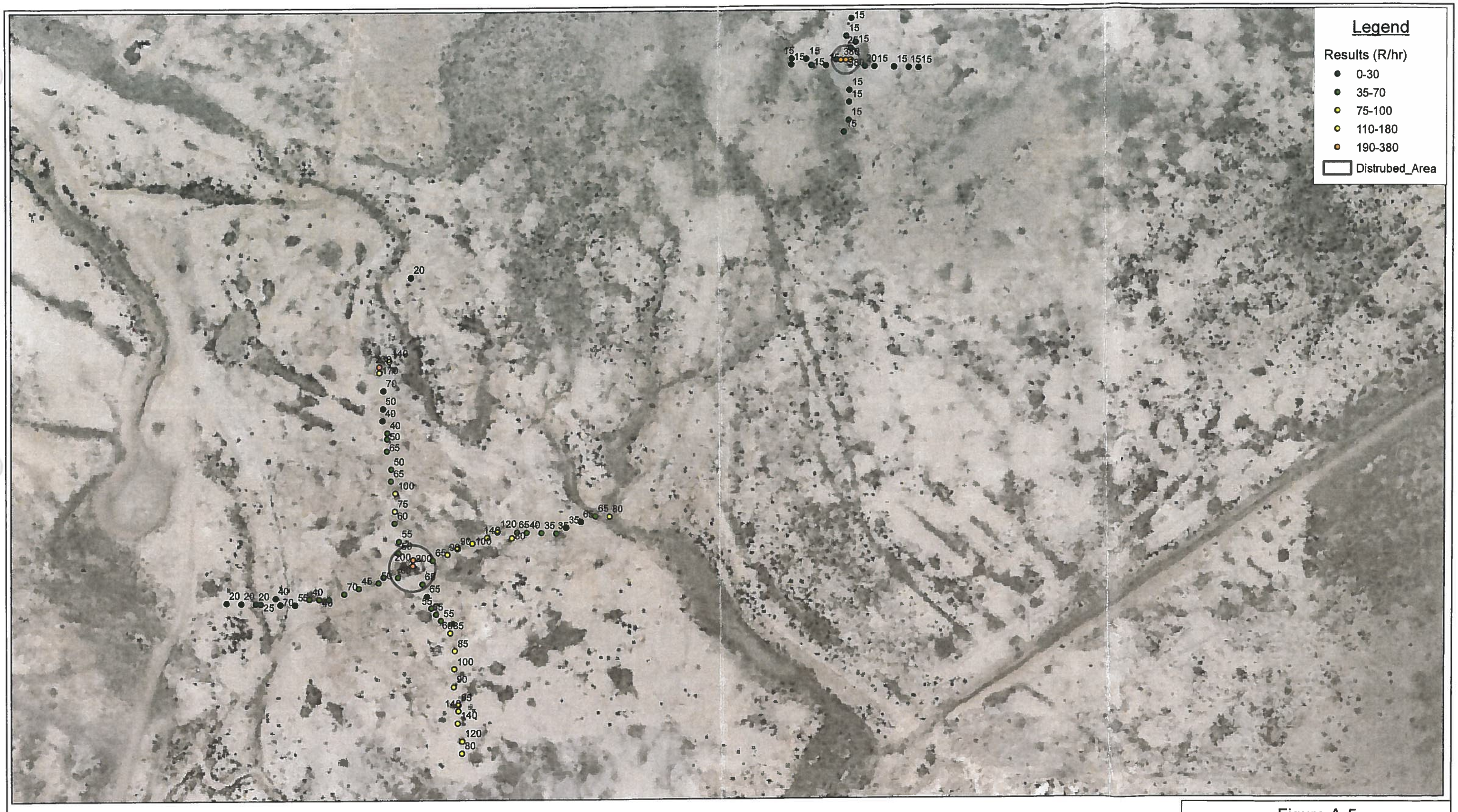
Figure A-3
Section 12 Shaft/Headframe
Gamma Survey Results
Southwest Resources, Inc.
Part 3 Permit

S:\Projects\SouthwestResources_Lotspeich_Sections_11and12\Graphics\maps\Sec12MainShaftRev2.mxd


Sources:
Aerial – RGIS website, dated 2011; GoogleEarth, dated 2012
Mines/shafts – Gamma Radiation Survey conducted by INTERA Inc. on February 12, 2013.

Figure A-4
Section 12 Vents
Gamma Survey Results
Southwest Resources, Inc.
Part 3 Permit

S:\Projects\SouthwestResources_Lotspeich_Sections_11and12\Graphics\maps\Sec12Vents.mxd




Sources:
Aerial – RGIS website, dated 2011; GoogleEarth, dated 2012
Mines/shafts – Gamma Radiation Survey conducted by INTERA Inc. on February 12, 2013.

Figure A-5
Dysart II Shaft/Headframe
Gamma Survey Results
Southwest Resources, Inc.
Part 3 Permit

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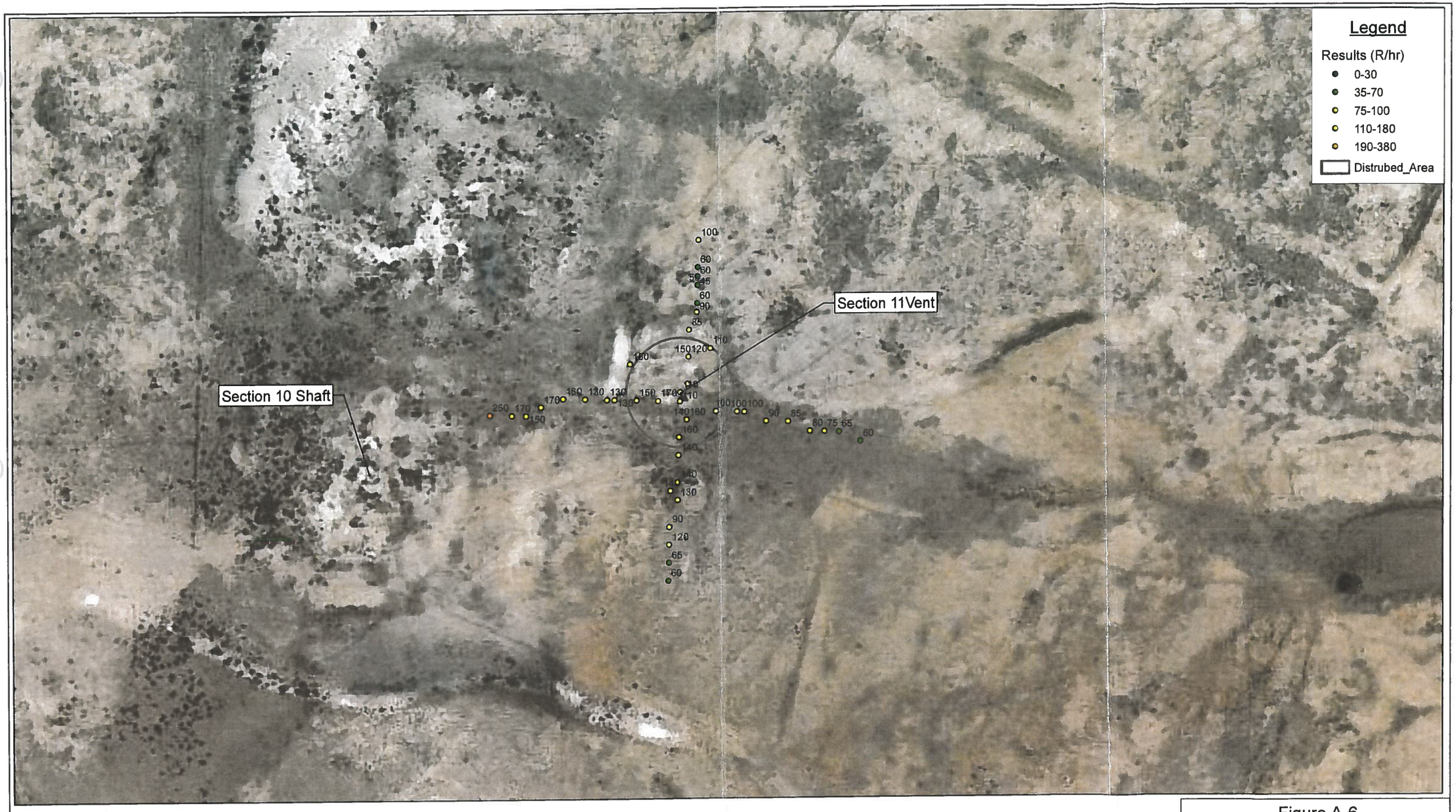


Sources:
Aerial – RGIS website, dated 2011; GoogleEarth, dated 2012
Mines/shafts – Gamma Radiation Survey conducted by INTERA Inc. on February 12, 2013.

Figure A-6
Section 11 Vent
Gamma Survey Results
Southwest Resources, Inc.
Part 3 Permit

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19.10.2 fees for Section 12 Mine application

| Reference | Fee | Reason |
|---|---|---|
| 19.10.2.201.a.1 | $1,000 | Base fee application |
| .2 | $225 | 15 acres disturbance @ $15/acre |
| .3 | $500<br>$500 | In accordance with 19.10.2.203 NMAC |
| .4 | $1500 | in accordance with Subsection K of 19.10.2.201 NMAC. Total disturbance 10 to 30 acres |
| Total application fee | $3,725 | |

Table 1

## GROUND WATER INFORMATION

A. Provide an estimate of depth to ground water and the total dissolved solids concentration.

Depth to ground water (ft.) **~630 ft. as measured during Section 12 (SW ¼) shaft installation in mid-late 1970's (See table below for additional regional water level information)**

| Distance from Dysart II (miles) | OSE record number | Owner's last name | finish date | depth well (ft) | depth to water (ft) |
|---|---|---|---|---|---|
| 1.0 – 2.0 | B 00366 | RIO ALGOM MINING LLC | 12/31/1955 | 760 | 0 |
| | B 00372 | SABRE-PINON CORPORATION | 09/12/1956 | 796 | 0 |
| | B 00373 | RIO ALGOM MINING LLC | 12/31/1956 | 1003 | 0 |
| | B 00994 | RIO ALGOM MINING LLC | 01/02/1958 | 827 | 0 |
| 2.0 – 3.0 | B 00143 | ANDREWS | 07/18/1960 | 90 | 60 |
| | B 00362 | RIO ALGOM MINING LLC | 11/30/1956 | 3093 | 0 |
| | B 00363 | RIO ALGOM MINING LLC | 04/30/1956 | 745 | 0 |
| | B 00371 | SABRE-PINON CORPORATION | 08/25/1956 | 752 | 0 |
| | B 00522 | UNITED NUCLEAR-HOMESTAKE PTNRS | 02/07/1978 | 70 | 0 |
| | B 00522 | UNITED NUCLEAR-HOMESTAKE PTNRS | 02/07/1978 | 70 | 0 |
| | B 00994 | RIO ALGOM MINING LLC | 09/18/1958 | 857 | 0 |
| 3.0 – 4.0 | B 01087 | ALBERS BROTHERS | 05/25/1985 | 651 | 566 |
| | B 01246 | ELKINS | 04/29/1992 | 1200 | 700 |

Note: Table source: Memorandum from Dana Bahar, Manager, Superfund Oversight Section Ground Water Quality Bureau, New Mexico Environment Department to LaDonna Turner, Site Assessment Manager Technical and Enforcement Branch U.S. Environmental Protection Agency, Region 6: "Pre-CERCLIS screening assessment of the Dysart #2 mine (Grants Mining District), McKinley County, New Mexico." Dated August 4, 2010. ftp://ftp.nmenv.state.nm.us/.../Dysart%20%232%2006162010.doc Accessed February 18, 2013.

Table 2

F. Describe how topsoil or topdressing will be salvaged, stockpiled and distributed for the re-establishment of vegetation:

See Appendix A, Further Comments for Reclamation Plan (§ 304.D.8).

G. Describe what kind of seed bed preparation will take place prior to seeding. What soil amendments will be added? Scarification of the seed bed needs to take place. Will this involve discing or ripping?

See Appendix A, Further Comments for Reclamation Plan (§ 304.D.8).

H. Describe in detail the plant species to be used in the re-establishment of vegetation:

| **Plant Name:** | **Rate of application (lb/ac)** |
|---|---|
| **Western wheatgrass** | **(See comment below for all application rates)** |
| **Alkali Sacaton** | |
| **Blue Grama** | |
| **Galleta** | |
| **Thickspike Wheatgrass** | |
| **Indian Ricegrass** | |
| **Sideoats** | |
| **Gramma** | |
| **Bottlebrush** | |
| **Squirreltail** | |
| **Desert globe mallow** | |
| **Palmer Pensetmon** | |
| **Rocky Mountain Penestemon** | |
| **Blue Flax** | |
| **Four-wing Saltbrush** | |
| **Winter Fat** | |

**Application rate will be approximately 17 pounds/acre. Only seed specific to Section 11 and 12 will be used.**

Table 3

| Table 4 Reclamation Spreadsheet for Financial Assurance Calculation | | | |
|---|---|---|---|
| Southwest Resources, Inc. Ambrosia Lake Sections 11 and 12 | | | |
| Item No. | Item Description | Total Price 2013 | Total Price 2019 i= 3% |
| 1 | SECTION 12 Mine | | |
| 1a | **Demolish and Scrap Headframe** | | |
| | Elevator | $1,200.00 | $1,432.92 |
| | Cables | $1,000.00 | $1,194.10 |
| | Dismantle Headframe | $32,000.00 | $38,211.20 |
| | Loading | $3,000.00 | $3,582.30 |
| | Hauling | $4,000.00 | $4,776.40 |
| | Disposal | $3,500.00 | $4,179.35 |
| | Disposal of Footings/Concrete Pads | $1,750.00 | $2,089.68 |
| | Electric Disconnection | $250.00 | $298.53 |
| | General Site Cleaning | $3,000.00 | $3,582.30 |
| | SUBTOTAL | $49,700.00 | $59,346.77 |
| 1b | **Abandon Main Shaft (diameter=12")** | | |
| | SiteClearingandGrubbing(assc.debris&on-siteSp | $2,000.00 | $2,388.20 |
| | Secure/Fill Shaft with Spoils | $3,000.00 | $3,582.30 |
| | Install PUF | $19,000.00 | $22,687.90 |
| | Install cement slurry | $3,000.00 | $3,582.30 |
| | Install topsoil | $500.00 | $597.05 |
| | Remove and Dispose concrete&metal debris | $1,350.00 | $1,612.04 |
| | SUBTOTAL | $28,850.00 | $34,449.79 |
| 1c | **Abandon Vent Shaft1B (diameter=54")** | | |
| | SiteClearingandGrubbing(assc.debris&on-siteSp | $300.00 | $358.23 |
| | Secure/Fill Shaft with Spoils | $400.00 | $477.64 |
| | Install PUF | $2,000.00 | $2,388.20 |
| | Install cement slurry | $650.00 | $776.17 |
| | Install topsoil | $100.00 | $119.41 |
| | Remove and Dispose concrete&metal debris | $300.00 | $358.23 |
| | SUBTOTAL | $3,750.00 | $4,477.88 |
| 1d | **Abandon Vent Shaft2B (diameter=54")** | | |
| | SiteClearingandGrubbing(assc.debris&on-siteSp | $300.00 | $358.23 |
| | Secure/Fill Shaft with Spoils | $400.00 | $477.64 |
| | Install PUF | $2,000.00 | $2,388.20 |
| | Install cement slurry | $650.00 | $776.17 |
| | Install topsoil | $100.00 | $119.41 |
| | Remove and Dispose concrete&metal debris | $300.00 | $358.23 |
| | SUBTOTAL | $3,750.00 | $4,477.88 |

| Table 4 Reclamation Spreadsheet for Financial Assurance Calculation | | | |
|---|---|---|---|
| Southwest Resources, Inc. Ambrosia Lake Sections 11 and 12 | | | |
| Item No. | Item Description | Total Price 2013 | Total Price 2019 i= 3% |
| 1e | **Reclaim and Scrap Miscellaneous** | | |
| | SiteClearingandGrubbing | $3,000.00 | $3,582.30 |
| | Loading | $6,000.00 | $7,164.60 |
| | Hauling | $4,000.00 | $4,776.40 |
| | Disposal | $7,000.00 | $8,358.70 |
| | SUBTOTAL | $20,000.00 | $23,882.00 |
| 1f | **Light Grade and Reseed** | | |
| | SUBTOTAL | $900.00 | $1,074.69 |
| | SECTION 12 SUBTOTAL | $106,950.00 | $127,709.00 |
| 2 | Section 11 | | |
| 2a | **Demolish and Scrap Headframe** | | |
| | Elevator | $1,500.00 | $1,791.15 |
| | Cables | $1,500.00 | $1,791.15 |
| | Dismantle Headframe | $13,000.00 | $15,523.30 |
| | Loading | $1,200.00 | $1,432.92 |
| | Hauling | $2,000.00 | $2,388.20 |
| | Disposal | $3,500.00 | $4,179.35 |
| | Disposal of Footings/Concrete Pads | $2,000.00 | $2,388.20 |
| | Electric Disconnection | $250.00 | $298.53 |
| | General Site Cleaning | $2,050.00 | $2,447.91 |
| | SUBTOTAL | $27,000.00 | $32,240.70 |
| 2b | **AbandonDysartIIShaftC(diameter=10')** | | |
| | Dismantle above ground fixtures | $2,000.00 | $2,388.20 |
| | Secure/Fill Shaft with Spoils | $3,200.00 | $3,821.12 |
| | Install PUF | $7,000.00 | $8,358.70 |
| | Install cement slurry | $2,000.00 | $2,388.20 |
| | Install topsoil | $550.00 | $656.76 |
| | Loading | $1,000.00 | $1,194.10 |
| | Hauling | $2,000.00 | $2,388.20 |
| | Disposal | $500.00 | $597.05 |
| | Disposal of Footings/Concrete Pads | $1,000.00 | $1,194.10 |
| | General Site Cleaning | $500.00 | $597.05 |
| | SUBTOTAL | $19,750.00 | $23,583.48 |

| Table 4 Reclamation Spreadsheet for Financial Assurance Calculation | | | |
|---|---|---|---|
| Southwest Resources, Inc. Ambrosia Lake Sections 11 and 12 | | | |
| Item No. | Item Description | Total Price 2013 | Total Price 2019 i= 3% |
| 2c | **Abandon Vent Shaft D (diameter=36")** | | |
| | Dismantle above ground fixtures | $100.00 | $119.41 |
| | Secure/Fill Shaft with Spoils | $100.00 | $119.41 |
| | Install PUF | $800.00 | $955.28 |
| | Install cement slurry | $250.00 | $298.53 |
| | Install topsoil | $50.00 | $59.71 |
| | Loading | $50.00 | $59.71 |
| | Hauling | $1,000.00 | $1,194.10 |
| | Disposal | $50.00 | $59.71 |
| | Disposal of Footings/Concrete Pads | $100.00 | $119.41 |
| | General Site Cleaning | $100.00 | $119.41 |
| | SUBTOTAL | $2,600.00 | $3,104.66 |
| 2d | **Reclaim and Scrap Miscellaneous** | | |
| | Dismantle and consolidate scrap metal | $5,000.00 | $5,970.50 |
| | Hauling | $5,000.00 | $5,970.50 |
| | Disposal of Scrap Metal | $3,850.00 | $4,597.29 |
| | SUBTOTAL | $13,850.00 | $16,538.29 |
| 2e | **Light Grade and Reseed** | | |
| | SUBTOTAL | $900.00 | $1,074.69 |
| | SECTION 11 SUBTOTAL | $64,100.00 | $76,541.81 |
| | SECTION 12 SUBTOTAL | $106,950.00 | $127,709.00 |
| | GRAND SUBTOTAL | $171,050.00 | $204,250.81 |
| | Re-engineering Contingency | $25,657.50 | $30,637.62 |
| | Site Survey Contingency | $17,105.00 | $20,425.08 |
| | GRAND TOTAL | $213,812.50 | $255,313.51 |

Notes : 1)An inflation rate of 3% was applied to current cost estimate to obtain future value using using the formula provided in the MMD Guidance to Mine Operators for calculating reclamation net present value, December, 2004 document. FV=PV*(1+i)n. Where FV=future value, PV= present value, i=inflation rate, and n=# of years (6)

2)Contingency rates were applied to the Grand Subtotal to obtain sums for the reengineering and site survey costs; reengineering contingency rate=15%, site survey contingency rate=10%

3) All cost estimate done on a lump sum basis from previously relevant experience.

# Table A-1
# Gamma Survey Values

Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Section 12 Main Shaft and Head Frame | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| SEC 12 MS | - | 45 |
| 20 | N | 90 |
| 40 | N | 85 |
| 60 | N | 70 |
| 80 | N | 65 |
| 100 | N | 65 |
| 20 | W | 130 |
| 40 | W | 190 |
| 60 | W | 195 |
| 80 | W | 300 |
| 100 | W | 240 |
| 20 | S | 230 |
| 40 | S | 190 |
| 60 | S | 120 |
| 80 | S | 90 |
| 100 | S | 30 |
| 20 | E | 170 |
| 40 | E | 170 |
| 60 | E | 220 |
| 80 | E | 220 |
| 100 | E | 220 |
| 120 | E | 180 |
| 140 | E | 180 |
| 160 | E | 180 |
| 180 | E | 180 |
| 200 | E | 180 |
| 220 | E | 180 |
| 240 | E | 120 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-3 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Section 12 Main Shaft and Head Frame (continued) | | |
|---|---|---|
| Distance | Direction | Value (μR/hr) |
| 260 | E | 220 |
| 280 | E | 170 |
| 300 | E | 220 |
| 320 | E | 160 |
| 340 | E | 140 |
| 360 | E | 120 |
| 380 | E | 160 |
| 400 | E | 150 |
| 420 | E | 140 |
| 440 | E | 140 |
| 460 | E | 150 |
| 480 | E | 150 |
| 500 | E | 130 |
| 520 | E | 150 |
| 540 | E | 170 |
| 600 | E | 50 |
| 700 | E | 30 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-3 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Section 12 Vent (East) | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| Shaft | - | 20 |
| | - | |
| | - | |
| 20 | N | 20 |
| 40 | N | 15 |
| 60 | N | 15 |
| 80 | N | 10 |
| 100 | N | 15 |
| 20 | W | 20 |
| 40 | W | 15 |
| 60 | W | 15 |
| 80 | W | 15 |
| 100 | W | 15 |
| 20 | S | 20 |
| 40 | S | 20 |
| 60 | S | 15 |
| 80 | S | 15 |
| 100 | S | 15 |
| 20 | E | 15 |
| 40 | E | 15 |
| 60 | E | 15 |
| 80 | E | 15 |
| 100 | E | 15 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-4 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Section 12 Vent (West) | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| Shaft | - | 380 |
| | | |
| | | |
| 20 | N | 25 |
| 40 | N | 15 |
| 60 | N | 15 |
| 80 | N | 15 |
| 100 | N | 15 |
| 20 | W | 20 |
| 40 | W | 15 |
| 60 | W | 15 |
| 80 | W | 15 |
| 100 | W | 15 |
| 20 | S | 15 |
| 40 | S | 15 |
| 60 | S | 15 |
| 80 | S | 15 |
| 100 | S | 15 |
| 20 | E | 20 |
| 40 | E | 15 |
| 60 | E | 15 |
| 80 | E | 15 |
| 100 | E | 15 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-4 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Dysart II | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| Shaft | - | 200 |
| 20 | N | 50 |
| 40 | N | 55 |
| 60 | N | 60 |
| 80 | N | 75 |
| 100 | N | 100 |
| 120 | N | 65 |
| 140 | N | 50 |
| 160 | N | 65 |
| 180 | N | 50 |
| 200 | N | 40 |
| 220 | N | 40 |
| 240 | N | 50 |
| 260 | N | 70 |
| 280 | N | 170 |
| 290 | N | 230 |
| 300 | N | 140 |
| 340 | E | 20 |
| 20 | E | 65 |
| 40 | E | 90 |
| 60 | E | 90 |
| 80 | E | 100 |
| 100 | E | 140 |
| 120 | E | 120 |
| 140 | E | 80 |
| 160 | E | 65 |
| 180 | E | 40 |
| 200 | E | 35 |
| 220 | E | 35 |
| 240 | E | 35 |
| 260 | E | 65 |
| 280 | E | 65 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-5 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Dysart II (continued) | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| 300 | E | 80 |
| 20 | S | 65 |
| 40 | S | 65 |
| 60 | S | 55 |
| 80 | S | 55 |
| 100 | S | 55 |
| 120 | S | 60 |
| 140 | S | 85 |
| 160 | S | 85 |
| 180 | S | 100 |
| 200 | S | 90 |
| 220 | S | 95 |
| 240 | S | 140 |
| 260 | S | 135 |
| 280 | S | 120 |
| 300 | S | 180 |
| 20 | W | 60 |
| 40 | W | 40 |
| 60 | W | 50 |
| 80 | W | 45 |
| 100 | W | 70 |
| 120 | W | 50 |
| 140 | W | 40 |
| 160 | W | 40 |
| 180 | W | 55 |
| 200 | W | 70 |
| 220 | W | 40 |
| 240 | W | 25 |
| 260 | W | 20 |
| 280 | W | 20 |
| 300 | W | 20 |
| | | |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-5 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Section 11 Vent | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| Shaft | - | 110 |
| 20 | N | 150 |
| 40 | N | 120 |
| 60 | N | 85 |
| 80 | N | 90 |
| 100 | N | 60 |
| 120 | N | 55 |
| 140 | N | 45 |
| 160 | N | 60 |
| 180 | N | 60 |
| 200 | N | 100 |
| 20 | W | 170 |
| 40 | W | 150 |
| 60 | W | 130 |
| 80 | W | 125 |
| 100 | W | 130 |
| 120 | W | 160 |
| 140 | W | 165 |
| 160 | W | 150 |
| 180 | W | 170 |
| 200 | W | 250 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-6 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Section 11 Vent (continued) | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| 20 | E | 135 |
| 40 | E | 100 |
| 60 | E | 100 |
| 80 | E | 100 |
| 100 | E | 90 |
| 120 | E | 85 |
| 140 | E | 80 |
| 160 | E | 75 |
| 180 | E | 65 |
| 200 | E | 60 |
| Spoils Pile | - | 150 |
| 20 | S | 155 |
| 40 | S | 155 |
| 60 | S | 140 |
| 80 | S | 135 |
| 100 | S | 140 |
| 120 | S | 130 |
| 140 | S | 90 |
| 160 | S | 115 |
| 180 | S | 65 |
| 200 | S | 60 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-6 for plot of survey data.

# Table A-1
## Gamma Survey Values
Southwest Resrouces, Inc.
Ambrosia Lake Sections 11 and 12

| Workers' Quarters | | |
|---|---|---|
| Distance | Direction | Value (µR/hr) |
| - | - | 10 |
| - | - | 10 |
| - | - | 10 |
| - | - | 10 |
| - | - | 10 |
| - | - | 10 |
| - | - | 10 |
| - | - | 10 |

Notes:

1. Survey by INTERA Inc. on February 12, 2013 using Ludlum Model 19 instrument.
2. See Figure A-7 for plot of survey data.