AMENDED NI 43-101
PRELIMINARY ECONOMIC ASSESSMENT
ROUND TOP PROJECT
Sierra Blanca, Texas

PREPARED FOR

539 West El Paso Street
Sierra Blanca, Texas 79851

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PREPARED BY

Donald E. Hulse, P.E., SME-RM
M. Claiborne Newton, III, Ph.D., SME-RM
Deepak Malhotra, PhD, SME-RM

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1 SUMMARY

Gustavson Associates, LLC (Gustavson) was commissioned by Texas Rare Earth Resources (TRER) to prepare an updated Preliminary Economic Assessment (PEA) for the Round Top Rare Earth Element Project (Round Top Project or the Project). The Project is located in Hudspeth County, Texas. The technical report presents the results of the PEA in accordance with Canadian National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101) and Canadian Institute of Mining, Metallurgy and Petroleum (CIM) "Best Practices and Reporting Guidelines", November 27, 2010. The effective date of this report is November 30, 2013. This amended report contains corrections to the PEA dated December 20, 2013 that were necessary due to the use of an incorrect conversion factor for element to oxide for one element – Ytterbium (Yb). The produced Ytterbium Oxide (Yb_2O_3) numbers in this amended report have decreased from those in the December 20, 2013 report by 10.33% in each of measured, indicated and inferred resource categories. The economics in this amended report changed from the original report due to the decrease in the Yb_2O_3 which would be produced. This amended report shows a pre-tax 10% net present value (NPV) of $1.43 billion compared to $1.47 billion in the original report, an internal rate of return (IRR) of 67% compared to 69%, and a pre-tax cash flow of $4.22 billion compared to $4.35 billion in the original report.

1.1 Property Description and Ownership

The Round Top Project is located approximately 8 miles northwest of Sierra Blanca in Hudspeth County, Texas; and approximately 85 miles southeast of El Paso, Texas. The Round Top Project consists of two 18-year Mining Lease Agreements with the General Land Office of the State of Texas (GLO). Mining Lease No. M-113629 consists of 860 acres on land that is owned by GLO, and Mining Lease No. M-113117 consists of 90 acres on land the surface of which is owned by TRER. The lease agreements provide TRER with the full use of the leased property, including all rights with respect to the surface and subsurface for any and all purposes, together with the rights of ingress and egress for the purposes of mineral exploration, development, and exploitation of minerals. TRER has negotiated the terms of an option agreement with the GLO to purchase the additional surface needed to develop the mine, leach fields and plant site (The Option Area). There are various small tracts of private surface land near and within the Option Area. TRER has to date purchased some 1300 acres of these tracts and continues the process of acquiring more. Although acquisition of these tracts is not necessary for the proposed development described in this PEA, TRER believes it is prudent to purchase these tracts in the event of future expansion of the project area.

1.2 Geology and Mineralization

The Round Top Project consists of a Tertiary rhyolite intrusion that is enriched in both heavy and light rare earth elements (REEs) and other incompatible elements such as Li, Be, F, U, Th, Nb, Ta and Hf. The stratigraphy is relatively simple, with Tertiary rhyolite laccoliths cutting Tertiary diorite dikes and intruding Cretaceous marine sedimentary rocks. The Project is located in the Trans-Pecos region, and has been structurally affected by Laramide thrusting and folding, subduction magmatism, and Basin and Range crustal extension. The main structures on the property are landslide and slump faulting, and north-northwest-trending normal faults.

Round Top rhyolite is enriched in Heavy Rare Earth Elements (HREEs). Statistical review of the current data shows that an estimated 70% of the total REE's grade being HREEs. REE mineralization occurs primarily as disseminated microcrystals of varieties of fluorite (such as yttrium-rich yttrofluorite) where HREEs have substituted for calcium, and as other REE-bearing accessory minerals. REE minerals occur mainly in vugs and as crystal coatings, suggesting late-stage crystallization from an incompatible element-rich fluid. Other incompatible elements were concentrated in these late magmatic fluids. Uranium occurs as fine disseminated grains of uraninite and coffinite. Niobium-tantalum bearing columbite is relatively abundant. Zircon also is relatively abundant and is the mineral containing the zirconium and hafnium. Several unidentified tin minerals are present and thorium is contained in thorite and within zircon.

The Round Top rhyolite was divided into five different alteration phases based on the intensity of hematitic and hydrothermal alteration: gray rhyolite, pink rhyolite, red rhyolite tan rhyolite and brown rhyolite in the order of least to most altered. . Hematitic alteration is a replacement of the magnetite by hematite and gives the rhyolite a red to pink color. Hydrothermal alteration was late and gives the rhyolite a tan to brown color. Mostly unaltered, gray rhyolite was also documented. Initial geochemical testwork, presented in Section 13, suggests that the gray and pink rhyolite units have the highest REE content, averaging between 554 and 615 parts per million (ppm) total REE + Yttrium (Y). Red and tan rhyolites, which may be strongly vapor-phase altered, contain about 8% lower abundance of REE and the brown rhyolite, which may be altered hydrothermally or by groundwater, contains about 23% less REE than the gray and pink varieties.

1.3 Exploration Status

Since January 2010, TRER has conducted the following exploration activities: surface sampling, logging cuttings from historical reverse circulation drilling, aeromagnetic surveying, an aeroradiometric survey, stream sediment surveying, gravity surveying, and exploratory drilling. These studies showed the distribution of REEs. To date, 173 historical drill holes have been located, and, since 2011, TRER has drilled 84 reverse circulation holes and 2 core holes. TRER has analyzed 3,081 drill samples.

1.4 Mineral Resource Estimate

Table 1-1 below shows the measured, indicated, and inferred mineral resources estimated within the Round Top Project, with an effective date of January 2013. There are no mineral reserves estimated for the Round Top Project. The mineral resource estimate was completed by Richard Schwering, a Gustavson geologist, and reviewed and accepted by M. Claiborne Newton, Gustavson Chief Geologist and qualified person. This mineral resource estimate has been prepared in accordance with NI 43-101 and CIM. Mineral resources are reported using a 428 ppm Yttrium equivalent cutoff. Mineral Resources are not Mineral Reserves and do not demonstrate economic viability. There is no certainty that all or any part of the Mineral Resource will be converted to Mineral Reserves.

Table 1-1 Mineral Resource Estimate

All Rhyolites with 428 gpt Cutoff

				Measured		Indicated		Measured + Indicated		Inferred	
	Element Symbol	Conversion Factor (wt %)	Short Tons	(x 1000)	230,984	(x 1000)	297,960	(x 1000)	528,944	(x 1000)	376,955
			Kilotonnes		209,502		270,250		479,752		341,898
			Element Oxide	gpt (elem.)	oxide (kg)*	gpt (elem.)	oxide (kg)	gpt (elem.)	oxide (kg)	gpt (elem.)	oxide (kg)
Lanthanum	La	1.1728	La_2O_3	19.9	4,889,520	20.1	6,370,672	20.0	11,260,192	20.3	8,139,857
Cerium	Ce	1.1713	Ce_2O_3	78.7	19,312,214	79.8	25,260,171	79.3	44,572,385	79.9	31,997,181
Praseodymium	Pr	1.1703	Pr_2O_3	10.32	2,530,265	10.4	3,289,242	10.37	5,819,507	10.43	4,173,288
Neodymium	Nd	1.1664	Nd_2O_3	28.203	6,891,789	28.482	8,978,075	28.360	15,869,864	28.613	11,410,579
Samarium	Sm	1.1596	Sm_2O_3	10.23	2,485,267	10.32	3,234,098	10.28	5,719,365	10.35	4,103,414
				Total LREO	**36,109,055**	**Total LREO**	**47,132,258**	**Total LREO**	**83,241,313**	**Total LREO**	**59,824,319**
Europium	Eu	1.1579	Eu_2O_3	0.13	31,536	0.14	43,809	0.14	75,345	0.14	55,424
Gadolinium	Gd	1.1526	Gd_2O_3	10.19	2,460,605	10.27	3,199,001	10.24	5,659,606	10.27	4,047,118
Terbium	Tb	1.151	Tb_2O_3	3.52	848,804	3.54	1,101,143	3.53	1,949,947	3.55	1,397,013
Dysprosium	Dy	1.1477	Dy_2O_3	30.93	7,436,995	30.96	9,602,727	30.95	17,039,722	30.83	12,097,586
Holmium	Ho	1.1455	Ho_2O_3	7.84	1,881,483	7.87	2,436,324	7.86	4,317,807	7.82	3,062,659
Erbium	Er	1.1435	Er_2O_3	32.63	7,817,042	32.55	10,058,945	32.58	17,875,987	32.28	12,620,207
Thulium	Tm	1.1421	Tm_2O_3	7.13	1,706,015	7.14	2,203,777	7.14	3,909,792	7.09	2,768,517
Ytterbium	Yb	1.1387	Yb_2O_3	56.99	13,595,562	56.91	17,513,105	56.94	31,108,667	56.52	22,004,336
Lutetium	Lu	1.1371	Lu_2O_3	8.89	2,117,823	8.89	2,731,906	8.89	4,849,729	8.79	3,417,310
Yttrium	Y	1.2699	Y_2O_3	219.2	58,317,548	219.5	75,330,231	219.4	133,647,779	217.3	94,346,555
				Total HREO	**96,213,413**	**Total HREO**	**124,220,968**	**Total HREO**	**220,434,381**	**Total HREO**	**155,816,725**
				Total REO	**132,322,468**	**Total REO**	**171,353,226**	**Total REO**	**303,675,694**	**Total REO**	**215,641,044**
Niobium	Nb	1.4305	Nb_2O_5	383.29	114,869,448	381.12	147,338,029	382.07	262,207,477	376.44	184,111,291
Hafnium	Hf	1.1793	HfO_2	86.7	21,420,647	86.3	27,504,284	86.5	48,924,931	85.6	34,513,965
Tantalum	Ta	1.2211	Ta_2O_5	67.3	17,216,921	67.1	22,143,130	67.2	39,360,051	66.4	27,721,460
Tin	Sn	1.2696	SnO_2	138	36,705,842	139	47,692,157	139	84,397,999	138.4	60,075,833
Uranium	U	1.1792	U_3O_8	45.43	11,223,270	45.03	14,350,091	45.20	25,573,361	45.15	18,202,960
Thorium	Th	1.1379	ThO_2	179.13	42,703,317	178.29	54,827,234	178.66	97,530,551	176.13	68,522,662

* To calculate oxide kilograms: convert gpt to wt%, multiply wt% element by conversion factor to get wt% oxide, divide that by 100 and multiply by kilotonnes times 1,000,000.

At the date of this PEA, there are some risks that could materially affect the potential development of the Mineral Resources principal of which is:

Processed material Disposal

The enriched material and adjacent rock contain trace values of radioactive elements. It is not yet known whether the resulting material from processed material will be classified as treated rock or as a contaminated mineral material. Although there seems to be no doubt that the project can be permitted, the classification of the processed material could change the costs for disposing of or treating this material. These costs could have an adverse impact on the project economics including, but not limited to, the results of the PEA described herein.

1.5 Material Development and Operations

This PEA, including the Round Top mine plan within this PEA, includes inferred mineral resource. Inferred mineral resources are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves.

In connection with the PEA, a conceptual design of the mine operations has been completed. The Round Top Project is expected to be an open pit mine operation to be mined with 45° inter-ramp wall angles. Daily production rates are estimated to be 20,000 metric tons or 22,000 short tons. Material will be crushed, stacked on a heap and leached with sulfuric acid. The pregnant solution will be subjected to a multi-stage cleaning process which will remove the major dissolved elements and an impure rare earth carbonate will be produced. This mixed rare earth carbonate will be re-solubalized in hydrochloric acid and further processed in a solvent extraction phase followed by precipitation of several REE minerals. For purposes of the PEA, it has been assumed that mining and processing operations will operate 24-hours per day, 7-days per week.

The Round Top mine plan is based on common truck loader production methods with in-pit crushing and conveying. An initial road will be pioneered up the mountain, with two phases developed to increase available working faces. The rhyolite will be mined in two 25 foot lifts on 50 foot benches. This gives a good match of medium sized equipment (70 ton trucks and wheel loaders with an 11 yard (yd) bucket) with an assumed daily production rate of 20,000 metric tons or 22,000 short tons. The truck/loader with in-pit primary crushing and conveying method was chosen at this stage for low estimated costs and because it is a common mining practice for mines with similar production rates and is well understood in the industry. TRER currently plans to own, operate, and maintain all equipment. Estimated mining cost per metric ton of rock is $1.90.

Pit slopes have been designed at 45° inter-ramp wall angle. In most of the pit, the contact between the rhyolite and limestone is shallower than this. Fracturing within the rhyolite is not yet completely understood and this may affect pit slopes, at least locally. Haul roads are designed at a width of 100 feet, which provides a safe running surface to truck width (19 feet) ratio of approximately 5:1. The maximum grade of the haul roads is 10%.

Due to the constant REE grades within the rhyolite, it is the applicable qualified person's opinion that traditional economic analyses of the pit limit are not meaningful. The overburden removal required for rhyolite production is minimal.

The preliminary pit design is for the first 20 years of the project and is shown in Figure 1-1 and the quantities of mineral material within the pit are listed in Table 1-2.

The heap leaching and subsequent separation processes will yield recoveries of 80% for Yttrium, 76% for Dysprosium, 65% for Ytterbium, and 65% for Lutetium.

Table 1-2 shows the material that the mine plan in the PEA assumes will be mined.

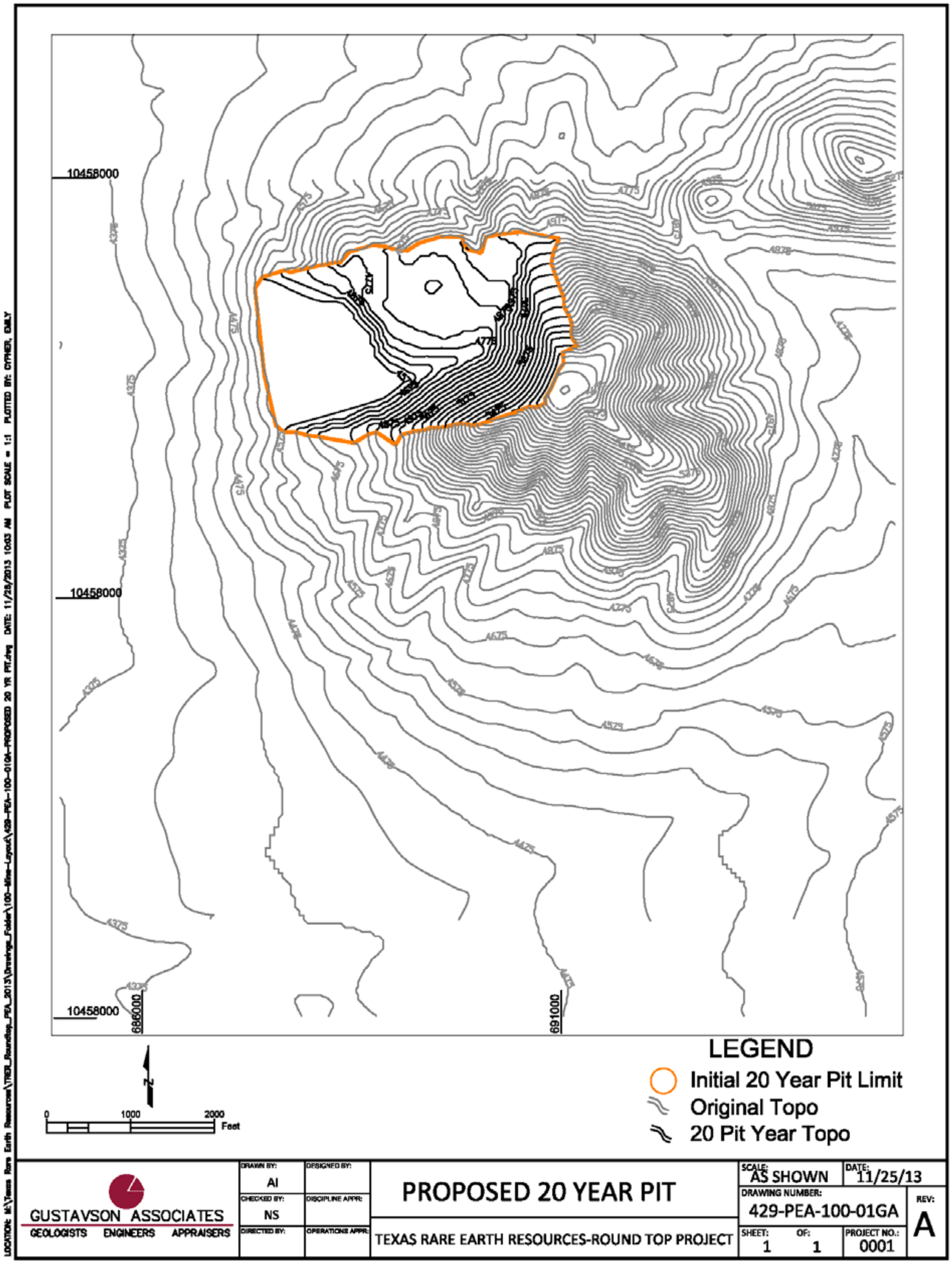


Figure 1-1 Preliminary Pit Design

Table 1-2 Summary of Material included in the Mine Plan*

Round Top – Material included in the Mine Plan Summary										
	Classification		Measured		Indicated		Measured & Indicated		Inferred	
Conversion Factor	Metric ton (x1000)		75,225		46,349		121,574		26,290	
	Symbol	Oxide	Grade REE (ppm)	REO Content (metric tons)	Grade REE (ppm)	REO Content (metric tons)	Grade REE (ppm)	REO Content (metric tons)	Grade REE (ppm)	REO Content (metric tons)
1.1728	La	La_2O_3	19.77	1,744	19.79	1,076	19.78	2,820	20.10	620
1.1713	Ce	Ce_2O_3	77.21	6,803	77.84	4,226	77.45	11,029	79.59	2,451
1.1703	Pr	Pr_2O_3	10.27	904	10.28	558	10.27	1,462	10.37	319
1.1664	Nd	Nd_2O_3	28.13	2,468	28.34	1,532	28.21	4,000	28.86	885
1.1596	Sm	Sm_2O_3	10.20	890	10.26	551	10.22	1,441	10.58	323
1.1579	Eu	Eu_2O_3	0.13	11	0.13	7	0.13	18	0.13	4
1.1526	Gd	Gd_2O_3	10.05	871	10.11	540	10.07	1,411	10.42	316
1.151	Tb	Tb_2O_3	3.47	301	3.50	187	3.48	487	3.62	109
1.1477	Dy	Dy_2O_3	31.06	2,682	31.01	1,650	31.04	4,332	31.58	953
1.1455	Ho	Ho_2O_3	7.88	679	7.91	420	7.89	1,099	8.07	243
1.1435	Er	Er_2O_3	33.02	2,840	33.05	1,752	33.03	4,592	33.50	1,007
1.1421	Tm	Tm_2O_3	7.12	612	7.16	379	7.13	991	7.27	218
1.1387	Yb	Yb_2O_3	57.48	4,924	57.32	3,025	57.42	7,949	57.35	1,717
1.1371	Lu	Lu_2O_3	9.00	770	9.00	474	9.00	1,244	9.03	270
1.2699	Y	Y_2O_3	220.84	21,096	221.42	13,032	221.06	34,128	225.84	7,540
	Total REO			47,595		29,408		77,003		16,974

*** Readers are cautioned that this is not a mineral resource estimate. The mineral resources estimate for the Round Top Project is shown in Table 1-1.**

Waste products from mine activities include a stream that are expected to show hazardous waste characteristics, and a stream that does not show hazardous waste characteristics. As such, two on-site impoundments are expected to manage the two waste streams.

Infrastructure to support mining and processing activities (i.e., buildings, roads, water/wastewater systems, power, communication, and fuel) currently do not exist on site. A detailed description of TRER's plans in respect of project infrastructure is outlined in Section 18.

The estimated unit operating costs for the operation are shown in Table 1-3.

Table 1-3 Operating Expenditures Summary

Description	LoM ($000)	Units	$/Tonne RoM
Mining Operating Costs			
Production	$204,417	$(000)	$1.40
Mine G&A	$73,589	$(000)	$0.50
Subtotal Mine	**$278,006**	**$(000)**	**$1.90**
Contingency	$27,801	$(000)	$0.19
Total Mine	**$305,806**	**$(000)**	**$2.09**
Process Operating Costs			
Crushing and Conveying	$255,500	$(000)	$1.75
Leaching	$401,500	$(000)	$2.75
Recover Mixed RE Carbonates	$255,500	$(000)	$1.75
Conversion to Oxides	$509,540	$(000)	$3.49
Water Treatment	$80,300	$(000)	$0.55
Environmental	$36,500	$(000)	$0.25
Marketing	$73,000	$(000)	$0.50
G & A	$73,000	$(000)	$0.50
Subtotal Process	**$1,684,840**	**$(000)**	**$11.54**
Contingency	$168,484	$(000)	$1.15
Total Process	**$1,853,324**	**$(000)**	**$12.69**
G&A Operating Costs			
Operating Supplies	$12,810	$(000)	$0.09
Equip, Envir, Utility, Lab, Other	$9,135	$(000)	$0.06
Personnel	$27,648	$(000)	$0.19
Subtotal G&A	**$49,593**	**$(000)**	**$0.34**
Contingency	$4,959	$(000)	$0.03
Total G&A	**$54,552**	**$(000)**	**$0.37**
Total Operating Expenditures	**$2,213,683**	**$(000)**	**$15.16**

1.6 Environment and Permitting

Table 1-4 includes a summary of the major federal and state environmental permits that may be applicable to the Round Top Project. An asterisk denotes an authorization that, based on current information, is expected to be required even without further factual and legal evaluation. These permits, including applicability criteria and agency process, are discussed in more detail in Section 20.

Table 1-4 Preliminary Permit Summary

Media	Permit	Agency	When Required
Air	New Source Review Permit to Construct	State TCEQ	Must be obtained prior to the start of construction.
	Title V Federal Operating Permit	US EPA	Application for permit must be filed prior to operating
Water	Construction Storm Water General Permit	State TCEQ	In advance of commencement of construction
	Industrial Storm Water Multi-Sector General Permit (MSGP)	State TCEQ	Prior to start of operation
	Public Water System Authorization	State TCEQ	Approval must be obtained prior to use of non-municipal water as drinking water source
	Water Rights Permit	State TCEQ	Must be obtained prior to using surface water
Operations	Petroleum Storage	TCEQ	Prior to storage of petroleum products on site
	Explosives permit	US Bureau of Alcohol, Tobacco, Firearms, and Explosives	Required prior to storage and use of explosives
Waste	Hazardous or Industrial Waste Management, Waste Streams, and Waste Management Units Registration	State TCEQ	Registration number must be obtained prior to engaging in regulated activity
	EPA ID Number for Hazardous Waste Activity Hazardous Waste Permit RCRA	U.S. EPA through the State TCEQ	ID number must be obtained prior to engaging in regulated activity
	Hazardous Waste Permit (including financial assurance)	State TCEQ	Must be obtained prior to commencement of hazardous waste treatment, storage, or disposal activities.
	Radioactive Material License	State TCEQ	Must be obtained prior to possession of materials containing NORM waste, as defined by THSC 401.003(26)

1.7 Economic Analysis

The economic evaluation for the Round Top Project used spot metal prices for each product and recoveries for each metal based upon the latest test results and are presented below in Table 1-5.

This PEA, including the mine plan, is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the results of this PEA, including this mine plan, will be realized. Mineral resources that are not mineral reserves have no demonstrated economic viability.

Table 1-5 shows a projected pre-tax 10% net present value (NPV) of $1.43 billion. The estimated internal rate of return (IRR) for the project is 67%. Estimated total pre-tax cash flow at full production is $4.22 billion.

The life-of-mine projected REOs sold in this study totals 159,535 tonnes. The life-of-mine capital costs estimate totals $845 million, which includes initial capital costs of $292.1 million, and sustaining capital of $552.9 million dollars. Also, included in the capital costs estimate is a 25% contingency.

Table 1-5 Indicative Economics

Description	Units	Value	Comments
Production			
RoM to Mill	ktonnes	146,000	
Yttrium Oxide Contained	tonnes	41,133	
Yttrium Oxide Recovered	tonnes	32,907	
Lanthanum Oxide Contained	tonnes	3,396	
Lanthanum Oxide Recovered	tonnes	1,936	
Cerium Oxide Contained	tonnes	13,308	
Cerium Oxide Recovered	tonnes	7,319	
Praseodymium Oxide Contained	tonnes	1,758	
Praseodymium Oxide Recovered	tonnes	1,160	
Neodymium Oxide Contained	tonnes	4,823	
Neodymium Oxide Recovered	tonnes	3,328	
Samarium Oxide Contained	tonnes	1,741	
Samarium Oxide Recovered	tonnes	1,288	
Europium Oxide Contained	tonnes	22	
Europium Oxide Recovered	tonnes	10	
Gadolinium Oxide Contained	tonnes	1,704	
Gadolinium Oxide Recovered	tonnes	1,057	
Terbium Oxide Contained	tonnes	589	
Terbium Oxide Recovered	tonnes	448	
Dysprosium Oxide Contained	tonnes	5,216	
Dysprosium Oxide Recovered	tonnes	3,964	
Holmium Oxide Contained	tonnes	1,325	
Holmium Oxide Recovered	tonnes	993	
Erbium Oxide Contained	tonnes	5,527	
Erbium Oxide Recovered	tonnes	4,366	
Thulium Oxide Contained	tonnes	1,193	
Thulium Oxide Recovered	tonnes	812	
Ytterbium Oxide Contained	tonnes	9,543	
Ytterbium Oxide Recovered	tonnes	6,203	
Lutetium Oxide Contained	tonnes	1,495	
Lutetium Oxide Recovered	tonnes	972	

Description	Units	Value	Comments
Estimate of Cash Flow			
Yttrium Market Price	$/kg	$22	
Lanthanum Market Price	$/kg	$3	
Cerium Market Price	$/kg	$4	
Praseodymium Market Price	$/kg	$58	
Neodymium Market Price	$/kg	$40	
Samarium Market Price	$/kg	$5	
Europium Market Price	$/kg	$540	
Gadolinium Market Price	$/kg	$24	
Terbium Market Price	$/kg	$930	
Dysprosium Market Price	$/kg	$528	
Holmium Market Price	$/kg	$350	
Erbium Market Price	$/kg	$125	
Thulium Market Price	$/kg	$1,025	
Ytterbium Market Price	$/kg	$190	
Lutetium Market Price	$/kg	$1,400	
Gross Revenue	**$(000)**	**$7,764,424**	
Refining & Transport	$(000)	$0	
Royalty	**$(000)**	**$7,764,424**	
Texas State Royalty	$(000)	($487,476)	
Gross Income	**$(000)**	**$7,276,947**	
Operating Costs			
Mining	$(000)	$278,006	
Process	$(000)	$1,684,840	
G&A	$(000)	$49,593	
Subtotal Operating Costs	**$(000)**	**$2,012,439**	
Contingency	$(000)	$201,244	
Total Operating Costs	**$(000)**	**$2,213,683**	
Operating Margin	**$(000)**	**$5,063,264**	
Capital			
Mine Equipment	$(000)	$36,161	
Mine Development	$(000)	$13,475	
Process Equipment	$(000)	$603,145	
Preproduction Costs	$(000)	$23,225	
Subtotal Capital	**$(000)**	**$676,006**	
Contingency	$(000)	$169,001	
Total Capital	**$(000)**	**$845,007**	
Income Tax	$(000)	$0	Pretax Model
Interest Expense	$(000)	$0	100% Equity Model
Cash Flow	**$(000)**	**$4,218,257**	
Present Value	10%	**$1,425,530**	
IRR	%	67%	
Payback	Years	1.5	

1.8 Conclusions

The Round Top Project hosts an Eocene-aged peralkaline rhyolite-hosted REE deposit with a high ratio of HREEs to LREEs. The rhyolite body is a mushroom-shaped laccolith, slightly elongated northwest-southeast and dipping gently to the southwest.

The REEs are primarily contained in the minerals yttrofluorite, cerofluorite and bastnaesite, which are very fine-grained and disseminated throughout the rhyolite mainly in microfractures, voids and coatings on predominantly alkali feldspar phenocrysts.

Five different colors of rhyolite are common and indicate varying degrees and types of alteration, although this seems to have minimal influence on the REE grades. A preliminary resource model of the deposit has an estimated indicated and measured resource of 480 million metric tons of rock containing 304 million kilograms of REO and an inferred resource of 342 million metric tons of rock containing 216 million kilograms of REOs. Detailed REE grades are shown in Table 1-1.

Side hill open pit mining methods are proposed with on-site processing facilities employing multiple solvent extraction and precipitation methods. Based on preliminary testwork completed to date, process recovery in excess of 70% REE is anticipated. The mineral resource model and project economics should be further investigated with consideration to uranium as a resource.

The PEA assumes a processing rate of 20,000 metric tons of rhyolite per day or 7.3 million tons per year, and analyzes the first 20 years of the mine life. The Base Case NPV at a 10% discount rate is estimated to be $1.43 billion. Life-of-mine capital costs are projected to be $845 million. Life-of-mine total cash flow is projected at $4.2 billion.

It is the qualified persons' opinion that the resource model described in this report is suitable for preliminary economic evaluation, and assessment of the potential project viability for determination of advancement of the Project. The PEA results justify advancing the Project to a pre-feasibility study.

1.9 Recommendations

Based on the potential economic viability of this project, the qualified persons' recommend the following:

- Conduct a detailed geotechnical study of the processing and leach sites.
- Conduct an environmental baseline study.
- Conduct continued metallurgical process development for detailed metallurgical studies.
- Continue mineralogical characterization of products produced.
- Prepare a feasibility study.
- Perform a preliminary review of uranium mineral resource potential.

A budget of $13.4 million dollars for metallurgy, metallurgical testwork, geotechnical studies, environmental studies and mine and facilities planning is recommended to move the Project through feasibility stage.

The budget is presented below.

Table 1-6 Proposed Budget Through Feasibility Stage

Task	Budget
Geo Technical Studies	$400,000
Environmental Studies	$2,000,000
Metallurgy	$2,500,000
Heap Leach Contractor Design	$400,000
Ground Water Wells / Hydrology	$500,000
Power Evaluation / Power Line Upgrade	$1,500,000
Feasibility Studies	$1,200,000
Subtotal	$8,500,000
Project personnel	$1,450,000
General and Administrative (project only)	$800,000
Subtotal	$10,750,000
Contingency 25%	$2,687,500
Total (with contingency)	**$13,437,500**

2 INTRODUCTION

2.1 Terms of Reference and Purpose of the Report

Gustavson Associates, LLC (Gustavson) was commissioned by Texas Rare Earth Resources (TRER) to prepare a Preliminary Economic Assessment (PEA) for the Round Top Project (or the Project) located in Hudspeth County, Texas, U.S.A. The purpose of this report is to present the findings of economic assessment in accordance with Canadian National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101), NI 43-101 Form F1, and Canadian Institute of Mining, Metallurgy and Petroleum (CIM) "Best Practices and Reporting Guidelines." The effective date of this report is November 30, 2013.

2.2 Qualifications of Qualified Persons

Mr. Donald Hulse, P.E., V.P. and Principal Mining Engineer for Gustavson, is a Qualified Person as defined by NI 43-101. Mr. Hulse acted as project manager during preparation of this report and is specifically responsible for report Sections 1 through 6, 15, 16, and 18 through 27.

Mr. M. Claiborne Newton, III, Ph.D., SMR-RM, Chief Geologist for Gustavson, is a Qualified Person as defined by NI 43-101. Mr. Newton acted as principle geologist during preparation of this report and is specifically responsible for report Sections 7-12 and 14.

Mr. Deepak Malhotra, PhD, SME-RM, President of Resource Development, Inc. (RDi) is a Qualified Person as defined by NI 43-101. Mr. Malhotra is specifically responsible for report Sections 13 and 17.

2.2.1 Details of Personal Inspection

Mr. Newton worked directly with TRER on the property for a period of three months during the drilling. Mr. Newton made four two-week long trips to the site in 2011, a two-week long visit in March of 2012 and the most recent visit was for eight days May 11-18, 2012. Mr. Newton set up and supervised reverse circulation (RC) drill sampling and quality assurance/quality control (QA/QC) procedures and observed and supervised both RC and drill core sampling from drill to courier. In addition, Mr. Newton reviewed certified laboratory reports and matched them with entries in the TRER database.

Donald Hulse visited the property on September 18, 2013 where he toured the property and inspected drill core, and assessed the infrastructure of the project.

2.3 Sources of Information

The information, opinions, conclusions, and estimates presented in this report are based on the following:

- Information and technical data provided by TRER;
- Review and assessment of previous investigations;
- Assumptions, conditions, and qualifications as set forth in the report; and
- Review and assessment of data, reports, and conclusions from other consulting organizations and previous property owners.

These sources of information are presented throughout this report and in Section 27 – References. The qualified persons are unaware of any material technical data other than that presented by TRER.

2.4 Units of Measure

All measurements used in this report are in presented in the metric system, except those maps that are in Texas State Plane – feet as required by the State of Texas for permitting purposes, unless otherwise specified, and all references to dollars are United States dollars.

3 RELIANCE ON OTHER EXPERTS

The qualified persons relied in good faith on information provided by TRER regarding property ownership and mineral tenure (Sections 1.1, 4.2.1 and 4.2.3). The qualified persons have not independently verified the status of the property ownership or mineral tenure. For the section regarding mineral pricing and contracts (Section 19) of this report, "Roskill, 2011 Rare Earth & Yttrium: Market Outlook to 2015," is referenced to support the metal pricing used for this PEA. The Roskill report is a standard industry reference and Mr. Donald E. Hulse, a qualified person, considers the use of this information within the PEA to be reasonable. Mr. Hulse compared the results of the Roskill report with contracts in the public domain and with published prices for some of the elements and is of the opinion that the pricing presented herein is within industry norms and suitable for use in the economic analysis.

Mineral commodities are always subject to fluctuations in prices responding to the supply and demand. As the Project moves closer to production, this risk can be mitigated with long-term contracts for sale of the products.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Property Location

The Round Top Project is located in Hudspeth County, Texas. The nearest town, Sierra Blanca, Texas, is approximately 8 miles to the northwest. Sierra Blanca, the county seat of Hudspeth County, is at the intersection of Ranch Road 1111, Interstate Highway 10, and 85 miles southeast of El Paso in the south central part of the county. It is also at a junction of two main branches of the Union Pacific Railroad. The approximate center of the Round Top Project is located at 31.276644° N, 105.474243° W. Figure 4-1 shows the location of the Round Top Project within Texas.

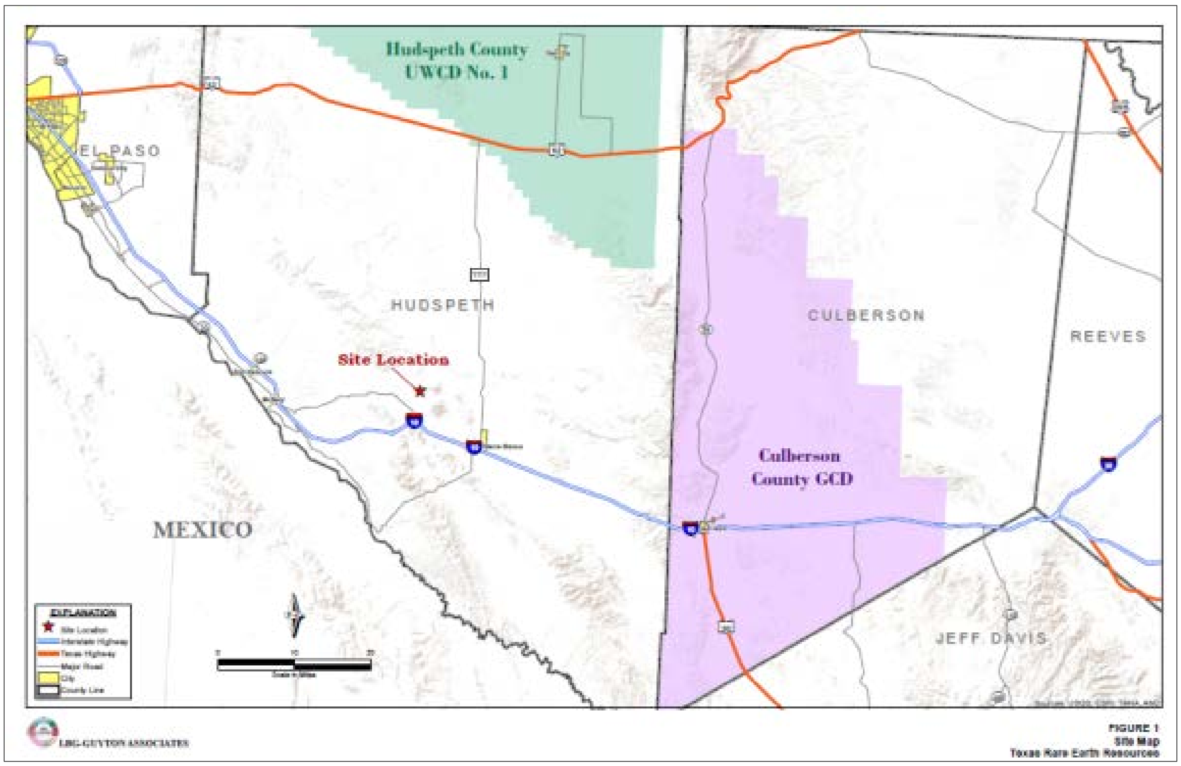


Figure 4-1 Location Map of Project Area

4.2 Mineral Tenure, Agreement and Royalties

4.2.1 Mining Leases

TRER entered into a 19 year renewable Mining Lease Agreement (M-113117) with the GLO dated September 2, 2011, and amended March 29, 2012 in accordance to Chapter 53, subchapter B of the Texas Natural Resource Code. TRER has also entered into an additional 19 year renewable Mining Lease (M-113629), dated November 1, 2011, with the GLO. Leases M-113117 and M-113629 (each a Mineral Lease and together, the Mineral Leases) represent approximately 860 and 90 acres, respectively, for a total of 950 acres in the project area, which would include the potential pit boundaries. The Mineral Leases provide TRER with the full use of the property identified, including all rights with respect to the surface and subsurface for any and all purposes, together with the rights of ingress and egress for the purposes of mineral exploration, development, and exploitation of minerals.

The compensation pay schedule for the Mineral Leases is summarized below:

Table 4-1 Summarized Lease Agreements Pay Schedule

M-113117	
Anniversary Date 2013 -2014	$44,718.30
Anniversary Date 2015-2019	$67,077.45
Anniversary Date 2020-2024	$134,154.90
Anniversary Date 2025-2029	$178,873.20
M-113629	
Anniversary Date 2013 -2014	$4,500.00
Anniversary Date 2015-2019	$6,750.00
Anniversary Date 2020-2024	$13,500.00
Anniversary Date 2025-2029	$18,000.00

Payments under the Mineral Leases represent rental and are intended to cover the privilege of deferring commencement of production. TRER shall have a minimum advance royalty of $500,000.00 immediately upon sales of leased minerals in commercial quantities. Thereafter the royalty will become payable on or before the anniversary date of the Mineral Lease.

4.2.2 Royalty

The Mineral Leases contain a 6.25% statutory production royalty of market value of all minerals.

The royalty calculation contained in the Mining Lease and as agreed to in principle with the GLO is calculated based on

Royalty = 6.25% * (Gross Revenue – processing cost)

Under the terms of the lease agreement, payment of the royalty in kind is at the discretion of the GLO commissioner. The above royalty calculation has not been finalized and therefore, in the economic section of this study a straight 6.25% royalty was taken on all gross revenue not subtracting any of the processing costs.

The processing cost includes primary crushing and conveying, secondary crushing and screening, tertiary crushing and screening, leaching, solvent extraction, precipitation and water treatment.

4.2.3 Surface Leases/Ownership

In an agreement dated March 6, 2013, TRER purchased the approximately fifty five thousand acres of fully paid up surface lease known as the West Ranch from the Southwest Range and Wildlife Foundation (Sentinel Mountain Associates, L.P.) (State of Texas Surface Lease SL 20040002). This lease covers the Option area and the area to the west. The area immediately to the east of the Project is also held by the Sierra Blanca Ranch LLC (Surface Lease SL 20060006). Figure 4-2 identifies the approximate boundaries of the TRER lease SL 20040002 (green) and 20060006 (blue).

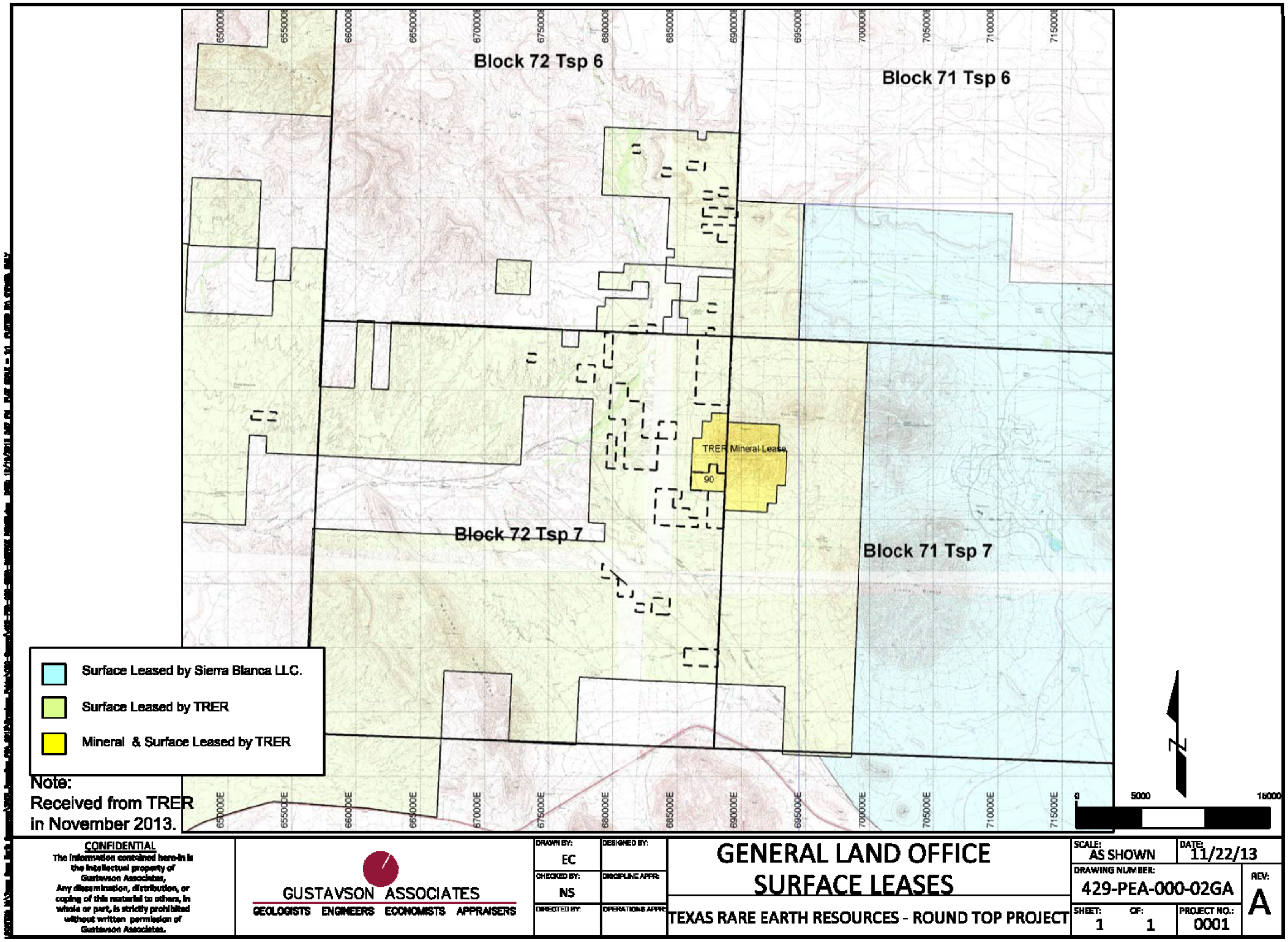


Figure 4-2 Surface Leases Adjacent and Including Round Top

TRER is in the process of developing a plan to acquire more private land owners' surface rights that may be required for the development of the project, and believes it is a reasonable expectation that it will be able to acquire such surface rights prior to the completion of a feasibility study.

4.2.4 Surface Option Area

In a term sheet transmitted November 22, 2013 the conditions of an option agreement (Option Agreement) are defined. This option agreement will provide TRER the option, at the time of its choosing, to purchase the surface acreage necessary to conduct its mining and processing operations. Figure 4-3 shows the surface option agreement.

4.2.5 Prospecting Permits

TRER currently holds 13 prospecting permits covering land in Hudspeth County. The prospecting permits allow for exploration activities on approximately 7110 acres. .

Table 4-2 TRER Permit Numbers and Associated Acres

Permit #	Acres
M114639	640
M114640	640
M114642	640
M114641	250
M114643	400
M114644	360
M114645	340
M-115990	640
M-115991	640
M-115992	640
M-115993	640
M-115994	640
M-115995	640

TRER has approximately 7,160 acres under annual prospecting permits with the State of Texas. TRER entered into the prospecting permits on October, 2012 and October 2013. All are renewable for a five year term on or before the anniversary date at a cost $1.00 per acre. Figure 4-4 displays the area covered by the prospecting permits.

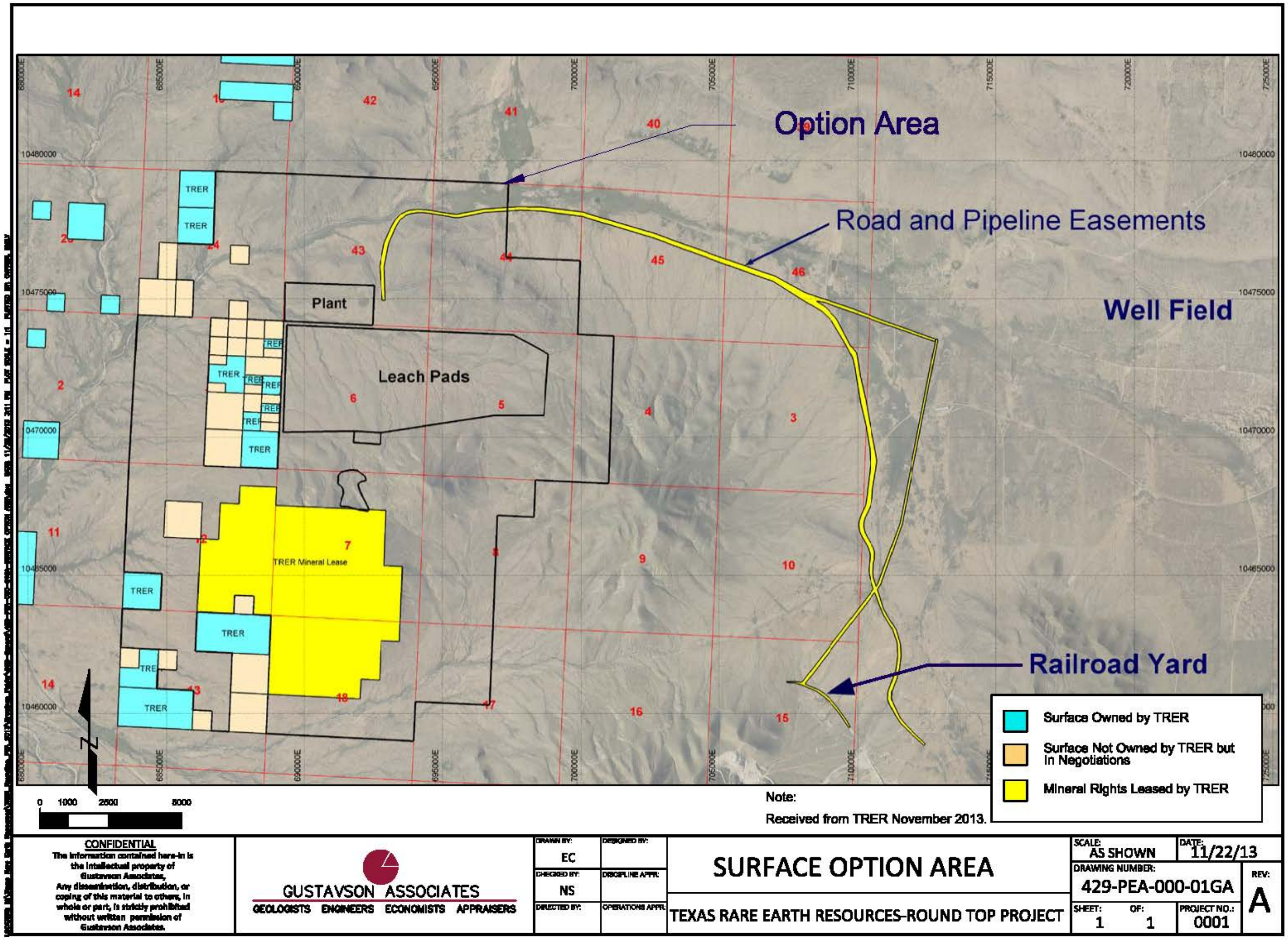


Figure 4-3 Surface Option Area

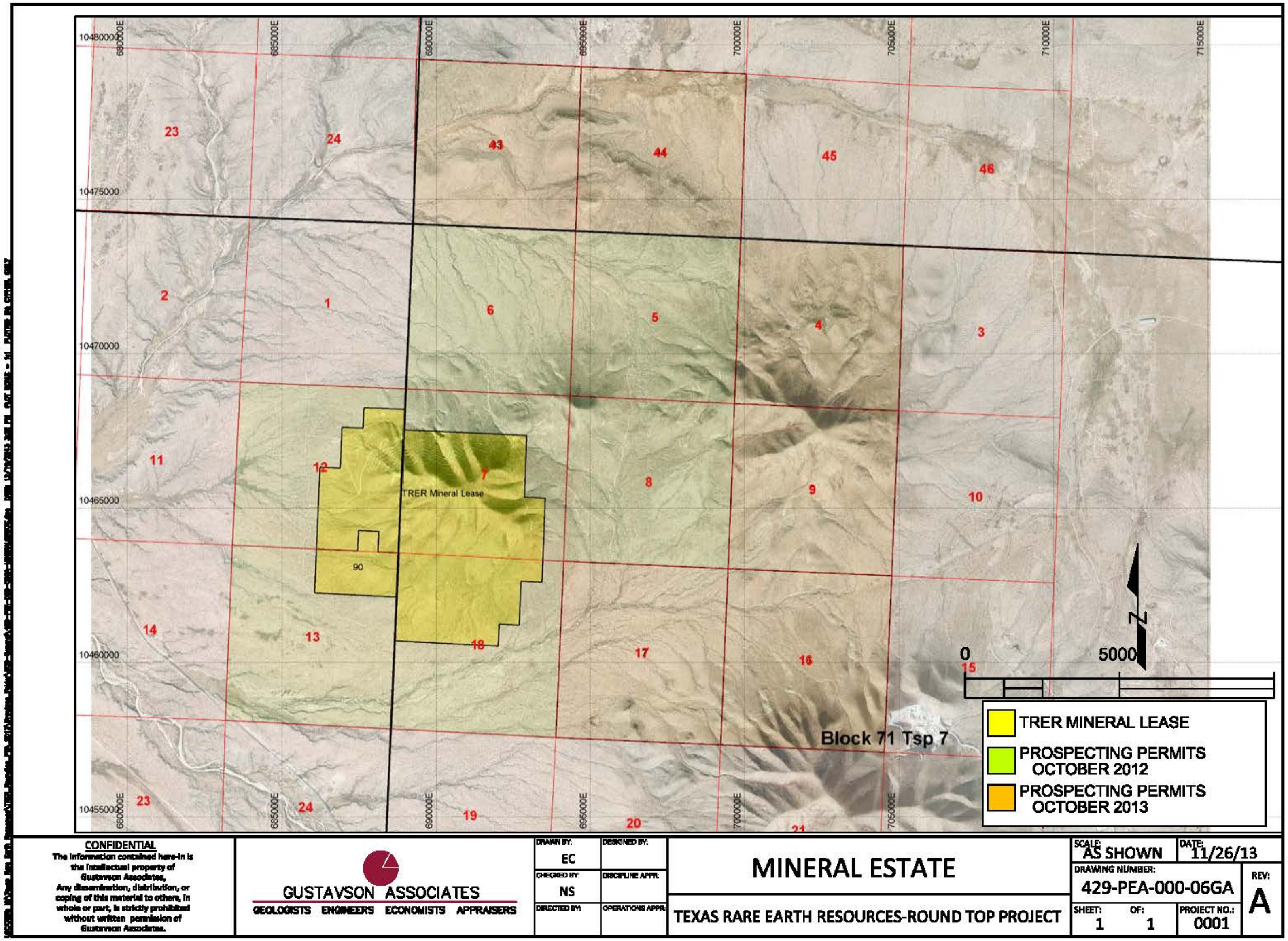


Figure 4-4 Mineral Estate

4.3 Environmental Liabilities

The Round Top Project rhyolite has not been mined and has no known existing mining-related environmental liabilities. Drill roads and pads will be reclaimed in accordance with the GLO requirements and Texas Commission on Environmental Quality requirements. There is an existing adit in the Buda Limestone underlying the rhyolite from earlier beryllium exploration; however there are no effluent flows from the adit, and no existing surface waste piles.

The permitting schedule for the Round Top Project may be influenced by the National Environmental Policy Act (NEPA) process due to the placement of a leaching facility if the drainage for the leaching facility is a “jurisdiction” drainage governed by the U.S. Army Corps of Engineers (USACE). NEPA typically requires baseline studies for at least one year, followed by a public review and comment period for scoping and development of an environmental assessment or environmental impact statement. Other anticipated permitting requirements include mine registration, air, ground and surface water, explosives, and utility location.

Proposed mining projects are typically evaluated for a range of social, economic, cultural, and environmental impacts in response to NEPA and state permitting regulations.

Environmental liabilities and permitting are discussed in greater detail in Section 20.

At this time there do not appear to be any other significant factors and risks that may affect access, title, right, or ability to perform work.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The Round Top Project is located approximately 8 miles northwest of the town of Sierra Blanca, Texas. The site is accessed from Interstate 10 through a series of paved and unimproved dirt roads. The property is not traversed by county roads and consists of a series of graded and primitive jeep roads. The nearest major airport is located in El Paso, Texas, 88 miles to the northwest. The site is approximately 3 miles north of Interstate 10. A railroad line is located approximately one to three miles from the Round Top Project and a spur line stops at a stone quarry within three miles of the Round Top Project.

5.2 Topography, Elevation, Vegetation and Climate

The Sierra Blanca area is considered semi-arid with generally mild temperatures. The prevailing winds are from the southwest. The average year round temperature is approximately 62.6° F, average annual precipitation is 10.41 inches, average annual snowfall is 1.01 inches, and average annual wind speed is approximately 13.90 mph. The elevation of the Round Top Project ranges from approximately 4,000 feet to approximately 6,890 feet, and slopes are moderately steep on the sides of the Sierra Blanca Peaks. The moderate climate and minimal rainfall in the Sierra Blanca region should allow the mine to operate year round.

The area surrounding the Project consists of sandy soils and clump grasses mixed with desert vegetation. Desert vegetation consists of high chaparral grass, grease wood, mesquite shrubs, cactus, and other shrubs and brush. Yucca plants are common on the surrounding property.

5.3 Local Resources and Infrastructure

The nearest population center to the Project is Sierra Blanca, Texas. The town of Sierra Blanca is approximately eight miles to the southeast of the Round Top Project site. The population was 533 in 2000 and 510 during the 2007 census. Skilled mining labor and support could be found in the El Paso area and in the mining areas of New Mexico and Arizona.

5.3.1 Rail Access

A major rail line parallels Interstate 10 approximately three miles west and south of the mine site. Approximately three miles from the Project site is a commercial rock quarry in operation which produces ballast for the railroad. The rock quarry operation has a rail road spur which is approximately three miles from the Project.

5.3.2 Power

Power is currently supplied to Sierra Blanca by El Paso Electric Company. El Paso Electric has approximately 1,643 megawatts of generating capacity. The existing line into Sierra Blanca is scheduled to be upgraded by El Paso Electric.

5.3.3 Water

Water for the project is planned to be supplied by a well-field located some 3 miles east of the plant site. There are four existing wells in this area. Data obtained to date suggests that this water supply is adequate to supply the proposed heap leach operation. TRER is currently negotiating an option with the Texas General Land Office to develop this area. The principal aquifer in this area is the Cretaceous Cox sandstone. The prolific Permian carbonate rocks at depth have not yet been tested. Figure 5-1 shows the location of the existing wells and the area to de developed. The quality of the water is expected to be adequate for process water needs and the water will require treatment to be potable.

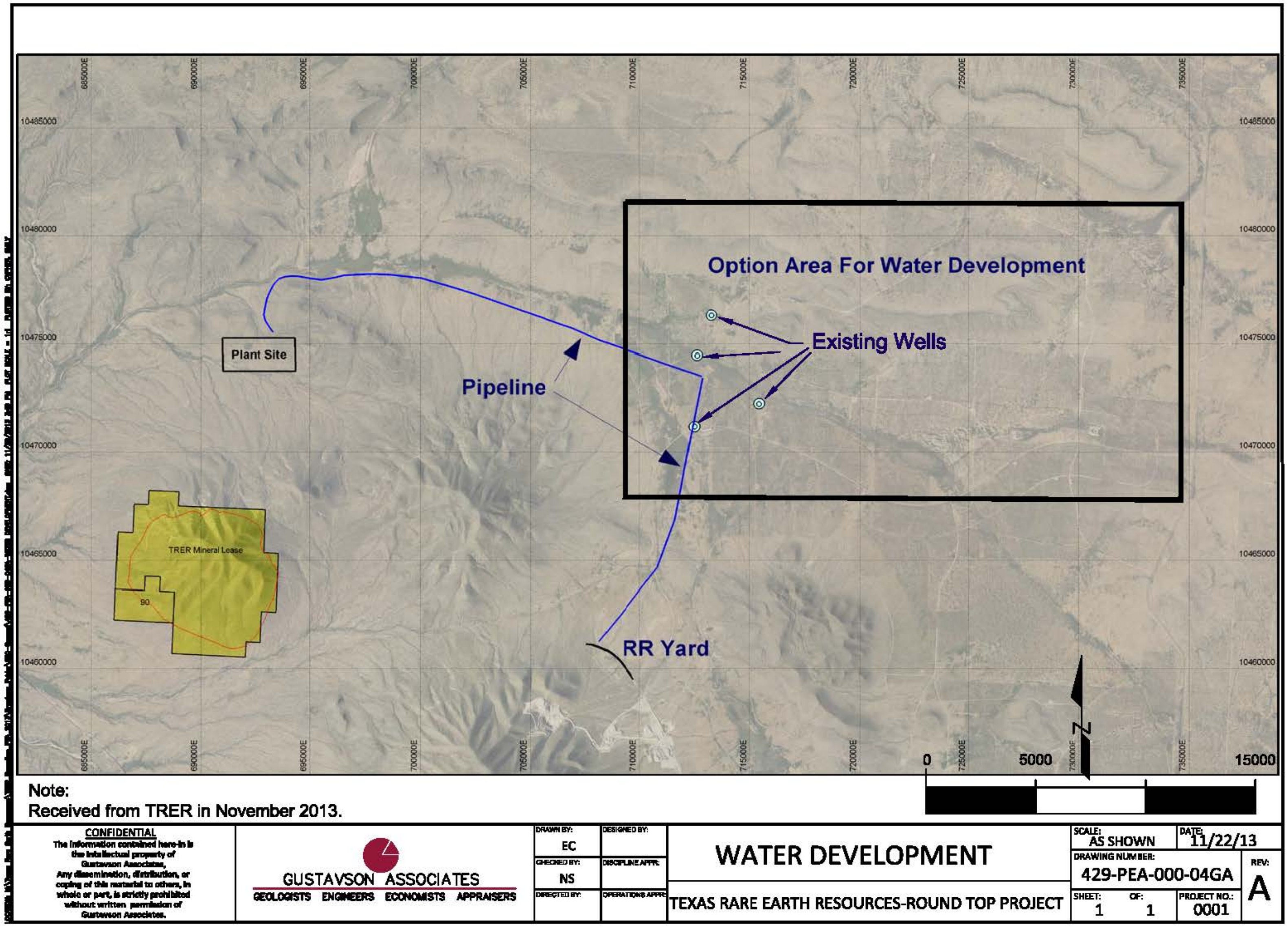


Figure 5-1 Potential Water Sources for Round Top Project, 2012

5.3.4 Natural Gas

Located approximately 28 miles to the north of the Round Top Project area is a transcontinental natural gas pipeline. The pipeline, with an eight-inch diameter pipe, is owned and operated by El Paso Natural Gas. The pipeline allows for the Project to consider utilizing an off take from the pipeline to the plant site for heating and other processing options. The use of the natural gas versus a propane system on site will need to be evaluated further. Expected uses of the propane/natural gas would be for heating the administration and process mine facilities, as well as for other processes requiring the input of energy. No large demand propane or natural gas fuel requirements are foreseen. Capital assessment assumes propane fuel basis.

6 HISTORY

Documented exploration began in Sierra Blanca in the 1970s when W.N. McAnulty initiated trenching and limited drilling of fluorite deposits in the vicinity of Sierra Blanca, Texas. McAnulty recognized and identified beryllium mineralization associated with the massive fluorite. Adverse economic conditions for fluorite precluded development. In the 1970s, several uranium companies identified anomalous radiation and associated mineralization associated with the beryllium-fluorite deposit.

During the 1980s, Cabot Corporation (Cabot), a large chemical company with a beryllium fabrication division, initiated exploration at Round Top for beryllium. In 1987, Cyprus Metals Company (Cyprus) entered into a joint venture with Cabot and took over the Project. The Cyprus exploration program drilled Sierra Blanca, Round Top and Little Round Top. Eventually, Cyprus focused on the Round Top Project, specifically the “west end ore zone”. Extensive development drilling (82,000 feet), underground exploration drift (1,115 feet) and trial mining resulted in the completion of a feasibility study in June 1988 (Cyprus Sierra Blanca, Inc., 1988).

During the Cabot-Cyprus development project, the Texas Bureau of Economic Geology (BEG) conducted extensive research at Round Top and the surrounding area. The study identified beryllium mineralization and REE mineralization in the rhyolite. The research resulted in the three publications, one in 1987 on the mineralogy of the rhyolite (Rubin, et al., 1987), another in 1988 on the beryllium mineralization (Rubin et al., 1988), and another in 1990 on the detailed mineralogy and geochemistry of the rhyolite (Price et al., 1990). The 1990 Price, et al., publication, Geological Society of America Special Paper 246, is the most complete publication on Round Top.

In late 2007, Standard Silver Corporation, later to be renamed TRER in 2010, acquired prospecting permits from the GLO. In 2008, upon opening the mine, approximately 76 pallets, each containing six plastic barrels of catalogued and packed Cyprus drill samples, were found. These samples were well labeled and Standard Silver (TRER) had acquired from the GLO, many of the drill logs from these holes. They were relogged extensively and analyzed as part of this report.

Cyprus established an internal resource of 300,000 tons of BeO in 1988 in conjunction with the feasibility study they did. This resource would not qualify as a resource by 43-101 standards and was not used in this study. There are no known significant reserves or production reported from previous operators.

In 2012, TRER completed a PEA prepared by Gustavson Associates on the Round Top deposit (NI 43-101 Preliminary Economic Assessment – Round Top Project, June 22, 2012). The resource model in that PEA was updated in early 2013 with additional drilling and assay data and was documented in a resource statement by Gustavson Associates (Resource Estimate and Statistical Summary – Round Top Project, September 30, 2013). The present PEA is an update of the 2012 PEA and utilizes the resource estimate from the September 2013 study.

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

Regional geology is described by Price et al. (1990) and McAnulty (1980) and is summarized here from those two references. Geologic units exposed in the project area comprise Cretaceous sedimentary rocks, Tertiary igneous rocks and Quaternary alluvium.

Sedimentary rocks exposed in the Trans-Pecos region are Cretaceous marine and littoral deposits of the upper Comanchean and lower Gulfian Series. These sedimentary deposits are transgressive clastics and neritic carbonates that were deposited along the northern edge of the Chihuahua trough and on the southern margin of the Diablo Platform. The regional stratigraphy is shown in Figure 7-1.

Tertiary intrusive rocks include Eocene diorite and rhyolite. Round Top Peak is part of the Sierra Blanca rhyolite laccoliths and lies within the Trans-Pecos region or Texas Lineament Zone. The Trans-Pecos region is characterized by three geologic episodes - Laramide thrusting and folding, subduction magmatism, and Basin and Range crustal extension.

Laramide deformation started in the late Cretaceous and ended in the early Eocene. Deformation was caused by east-northeast compression and resulted in dominantly north-northwest-trending folds and thrusts. The folds and thrusts extend from Chihuahua, Mexico to the east and northeast to the Sierra Blanca area. Lying near the frontal thrust of this Chihuahua tectonic belt are the Sierra Blanca intrusions.

From middle Eocene to early Oligocene time, approximately 48 to 32 Ma, widespread magmatism occurred in the Trans-Pecos region. Dikes and faults with an east-northeast-strike dominate the region and suggest a continuation of the east-northeast Laramide maximum principal stress direction. Igneous rocks that were intruded during this episode have alkali-calcic and alkaline compositions. Based on these two compositions, the region is divided into a western alkali-calcic belt and an eastern alkaline belt. Lying within the alkali-calcic belt are the Sierra Blanca laccoliths, which include Round Top Peak. The Sierra Blanca laccoliths were intruded about 36 Ma, during the main Trans-Pecos magmatism phase.

Basin and Range extension and region-wide normal faulting began about 31 Ma. This extension and related minor volcanism postdate the intrusion of the Sierra Blanca laccoliths.

7.2 Local Geology

The five mountains Triple Hill, Sierra Blanca Peak, Little Blanca, Round Top, and Little Round Top, form the Sierra Blanca. They were intruded into Cretaceous age sedimentary rocks. The peaks are widely covered by colluvium and surrounded by alluvium but the Cretaceous rocks can be seen in arroyos along the flanks of the mountains and in outcrop to the north of the peaks.

Buda Limestone, the Del Rio shale, Espy limestone, Benevides formation, Finlay limestone and Cox sandstone are exposed at the surface in the Sierra Blanca Peaks area. Numerous titanium-rich hornblende-porphyry diorite dikes and sills are exposed along the flanks of the peaks and in localized areas of thin alluvium cover. The age of these dikes is about 48 Ma (Early Eocene), which predates the main phase of felsic magmatism (Price et al., 1990).

The rhyolite laccoliths cut and altered the diorite dikes and sills. The fine grain size and presence of vesicles in the rhyolite suggests near-surface intrusion. The age of the Sierra Blanca rhyolites is estimated to be 36 Ma (Late Eocene) based on one K-Ar date. Uplifted sedimentary cover was eroded from the tops of the Sierra Blanca laccoliths leaving the present surface expression of the peaks (Price et al., 1990).

The bases of the intrusive bodies are undulating and in contact with several different formations. Some of the rhyolite intrusions may be floored by a shallow thrust fault that truncates underlying Cretaceous sedimentary rocks. Strata on the flanks of the laccoliths are steeply dipping due to deformation from the underlying intrusion (McAnulty, 1980).

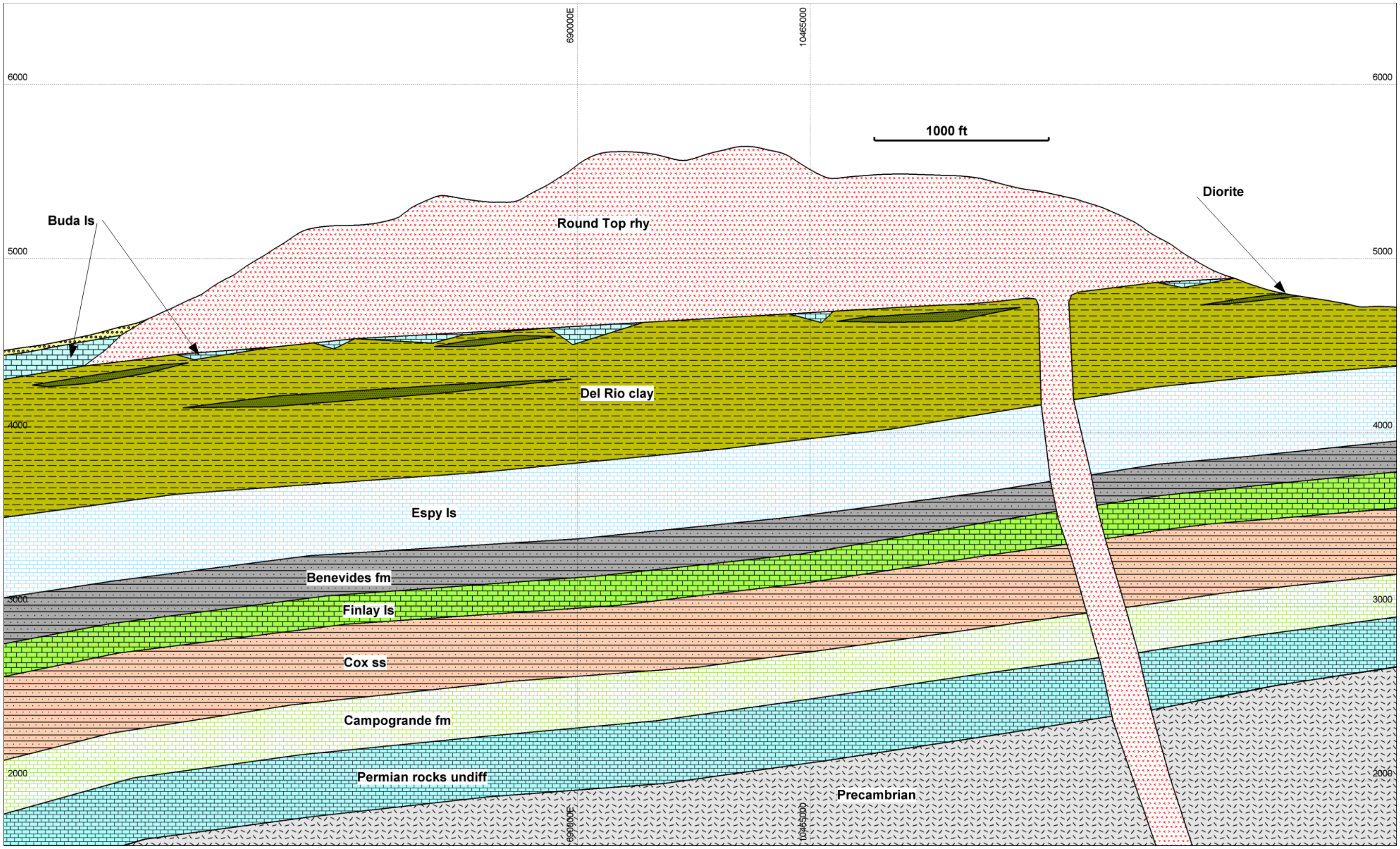
7.3 Property Geology

The Round Top Peak laccolith was intruded into Cretaceous age Washita and Fredericksburg Groups. The Cretaceous sediments were domed upward by the rhyolite intrusion and later eroded, exposing the Round Top Peak rhyolite. Sedimentary rocks exposed on the surface flanking Round Top Peak consist of the Buda Limestone and Del Rio clay and Espy limestone formations of the Washita group and the Benevides formation, Finlay limestone and Cox sandstone of the Fredericksburg group.

The rhyolite is cut by a set of faults that generally strike northwest and dip steeply southwest. Normal separation has been noted on some of these faults, but the orientation with respect to other regional faults suggests they may primarily be right-lateral strike-slip faults. The rhyolite is highly brecciated and moderately altered along these zones.

7.3.1 Stratigraphy

Figure 7-1 is a stratigraphic section of the Round Top area and Table 7-1 is a description of the strata immediately adjacent to the rhyolite.



(Source TRER)

Figure 7-1 NW-SE Section Looking NE Through Round Top Mountain Showing the Underlying Sedimentary Rocks

Table 7-1 Sedimentary Formations in the Round Top Peak Project Area

Formation	Age	Description
Gravel	Quaternary	Mixture of limestone, sandstone, intrusive rocks and conglomerate. Sand to boulder size, angular to sub-angular grains.
Buda Limestone	Cretaceous	Micritic limestone with thin shale partings and nodular limestone with fossil oysters.
Del Rio	Cretaceous	Dominated by olive brown to black fissile shale, with micritic limestone interbeds. Near the top of the formation is a massive limestone unit overlying a quartz sandstone bed.
Espy Limestone	Cretaceous	Gray nodular limestone interbedded with marl and shale.

Quaternary

Quaternary units in the project area are represented by colluvium and alluvium deposits. The slopes of Round Top Peak are covered with colluvium and talus slopes. Surrounding the mountain is Quaternary age alluvium. This alluvium is divided into two formations, the Madden and Balluco Gravels (Albritton and Smith, 1965). Near the flanks of the peak, these two formations contain abundant fragments of different colored rhyolite that eroded from Round Top Peak. In addition to the rhyolite, limestone, sandstone, and diorite are also present. The alluvium and colluvium are now being dissected and exposed in arroyos.

Tertiary

Tertiary rocks in the project area are represented mainly by the rhyolite intrusions, though the diorite dikes are also thought to be Tertiary in age. Round Top Peak is likely the youngest intrusion in the project area. The age of the rhyolite intrusions, ~36.2 Ma, is represented by one K-Ar date on an annite-rich biotite from Sierra Blanca Peak (Price et al., 1990).

Table 7-2 is a representative whole-rock analysis of the Round Top rhyolite. It contains >72% SiO_2, >10% Na_2O+K_2O and > 1% fluorine. The rock contains modal cryolite (Na_3AlF_6) and normative acmite and Na_2SiO_3 and can be classified as a peralkaline-cryolite rhyolite. The rhyolite has a fine-grained, microporphyritic texture consisting of quartz, alkali-feldspar, and Li-mica phenocrysts in an aphanitic groundmass. The cores of the alkali-feldspars consist of Na-plagioclase or albite, and the Li-mica is zoned with a brown interior grading outward to clear on the crystal margins. Cryolite occurs as discrete grains intergrown with groundmass quartz and as inclusions in quartz overgrowths on phenocrysts. Cryolite can also occur as clear crystals coating fractures and locally cementing rhyolite breccias. Rutilated quartz is also present and occurs in association with the cryolite as intergrowths.

The color of the rhyolite varies, and recent drill data indicates five different colors of rhyolite which indicate five alteration phases: gray, pink, red, tan, and brown. These different rhyolite colors represent different degrees of alteration that took place during the later stages of crystallization. The pink and red colors are caused by the increasing replacement of magnetite by hematite. The tan and brown coloration in the rhyolite indicates most of the iron has been removed or altered to goethite and/or limonite. The feldspars in the tan rhyolite are replaced by kaolinite, and in isolated locations this alteration phase can have fluorite-filled fractures. The gray rhyolite is essentially unaltered and has variable magnetite content. The gray, pink and red colored units are generally tens to hundreds of feet thick and laterally extensive. Some of the rhyolite displays flow-banding with gray (unaltered) and pink (hematite altered) alternating bands. Some of the red rhyolite contains beige and gray discontinuous bands associated with microfractures. There is a crude vertical zonation with gray rhyolite predominating at the top of the laccolith, red and pink rhyolite predominating in the central zone of the body and gray and tan rhyolite mostly confined to the base of the rhyolite. Initial geochemical testwork, based on a small number of composites and presented in Section 13, suggests that the gray and pink rhyolite units have the highest REE content, averaging between 554 and 615 ppm total REE + Y. Based on a small number of composites, red and tan rhyolites, which may be strongly vapor-phase altered, contain about 8% lower abundance of REE. The brown rhyolite, which may be hydrothermally or groundwater-altered, contains about 23% less REE than the gray and pink varieties.

Cretaceous strata within the project area are cut by diorite dikes and sills that have an age of 48 Ma (McAnulty, 1980). These diorite intrusions were emplaced during a magmatic episode that took place after compressional folding in the Trans-Pecos region. On Round Top Peak, the diorite dikes and sills are exposed in bulldozer cuts on the flanks and along the back of the exploration decline on the north side of the mountain. They vary in thickness from under 2 feet to over 100 feet thick. In some locations, the sills are in direct contact with the rhyolite and are partially replaced and veined by fluorite. In addition to surface exposures, drill data indicates the rhyolite is locally in direct contact with the diorite sills, suggesting the rhyolite intrusion followed the pre-existing diorite intrusion pathways.

The dikes and sills are described by Price et al. (1990) to be a titanium-rich hornblende-porphyry diorite. Other investigators describe the rock type to be diorite (McAnulty, 1980). Albritton and Smith (1965) describe the dikes and sills as having a variable composition consisting of andesite, hornblende-andesite porphyry, and latite porphyry. Within the project area, the sills encountered during drilling and exposed in bulldozer cuts appear to be a hornblende-porphyry diorite.

Cretaceous

Formations represented by the Cretaceous Washita Group are exposed on the surface in drainages and on the flanks of Round Top Peak. The youngest Washita Group formation in the project area is the Buda Limestone. The Round Top rhyolite intruded along the contact of the Buda and the underlying Del Rio. Apparently most of the Buda was wedged upward by the rhyolite but some blocks remain below the rhyolite contact. The Buda limestone, when present below the rhyolite, is the host of replacement beryllium/fluorite bodies and was the target of the Cabot/Cyprus exploration program. Outcrops of Buda Limestone on the northern slope of

Round Top Peak present as a micritic limestone interbedded with thin shale partings. Fossil oysters are found in the micritic limestone beds.

On the north side of the Round Top laccolith, the Del Rio Formation is exposed in a deep arroyo. The Del Rio Formation is also exposed on the east and south slopes of the peak. The exposed section is composed of olive brown shale with interbeds of quartz sandstone and nodular limestone. The olive brown shale grades into a black shale with depth. Drilling shows the Del Rio Formation is in direct contact with the overlying Round Top rhyolite. Under the rhyolite intrusion, the Del Rio is a black to brown shale or black fine-grained sandstone.

North of the project area the Espy limestone, Benevides formation, Finlay limestone and Cox sandstone can be found in outcrop. The Espy is a well-bedded gray, nodular limestone with interbedded marl and shale. The Benevides formation consists of interbedded brown to buff sandstone, cream to tan shale with thin interbeds of gray limestone. The Finlay limestone is a massive bedded gray fossiliferous limestone. The Cox is a coarse to fine sandstone with interbeds of shale and siltstone. The Cox is thought to be the principal aquifer in the subsurface to the east of the project area. The Campogrande formation is not exposed in the area but is thought to be sequence of limestone, marl, siltstone and shale. Permian rocks are likewise not exposed in the area but likely are carbonate rocks equivalent to the Bone Spring and Victorio Peak limestones. These Permian rocks have the potential of being prolific aquifers. What is called the Precambrian basement is a mixture of metamorphic and igneous rocks.

7.3.2 Structural Geology

On the slopes of Round Top Peak the dominant structures are slumps and landslide faults. These structures are mostly found on the south and east side of the mountain. Steep and divergent structural attitudes and hummocky topography characterize the slumps and landslide faults. On Round Top Peak, the upper Espy and Del Rio Formations were deformed by landslide faulting.

Drill data and the geologic model indicate Round Top Peak, including the rhyolite, is cut by a number of northwest trending faults that developed during early Basin and Range tectonism, some of which are shown in Figure 7-2. These faults are steeply dipping, ranging from 75 degrees to near vertical. Normal separation on these faults varies from 50 to 100 feet (ft) and the faults offset the intrusive floor. In addition to normal slip, these faults also may have experienced right-lateral strike-slip shearing. Brittle fracturing and brecciation in the rhyolite were common in the vicinity of the faults.

Drill data indicates some of these faults are filled with fault gouge, clay, and breccia. Rhyolite along these fracture zones are highly brecciated and commonly brown in color from hydrothermal or groundwater alteration. On the west side of the laccolith, the faults are closely spaced varying from 100 ft to 500 ft and on the east side they are over 500 ft apart. The east side is subsequently less fractured.

Faults on the west side of Round Top Peak show late-stage hydrothermal mineralization and alteration. These faults are mineralized with fluorite, chalcedony, calcite and clay replacing angular rhyolite breccia fragments. Calcite, clay and fluorite fill open spaces within the fault zones and in adjacent fractured rocks.

Slickensides have been noted in the rhyolite at the contact with Cretaceous sedimentary rocks. There may have been post-rhyolite movement along a low-angle fault between the rhyolite and older rocks.

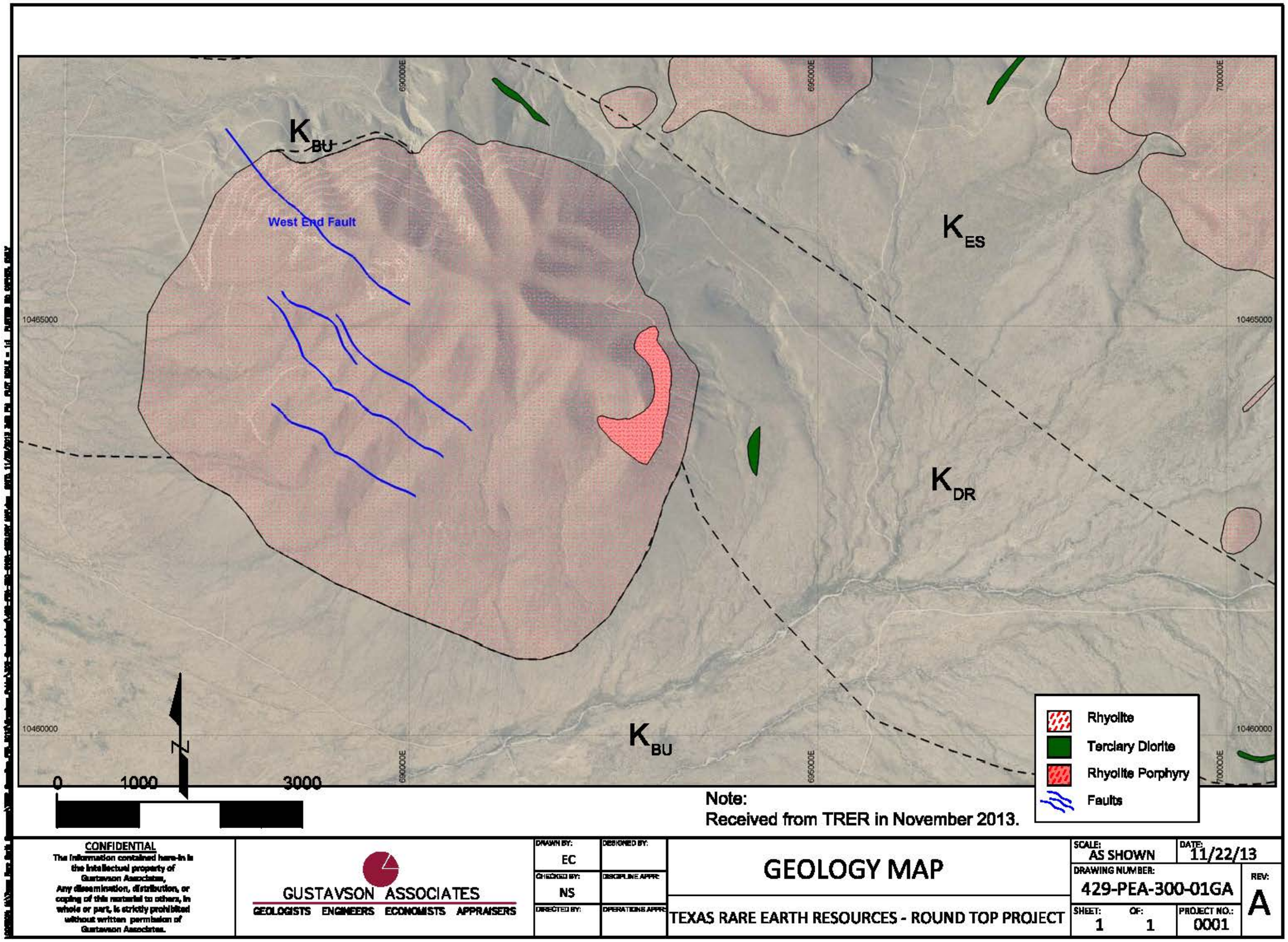


Figure 7-2 Round Top Peak Geology

7.4 Mineralization

REE mineralization is hosted by the Round Top Peak laccolith. The rhyolite is fine grained with a microporphyritic texture. The porphyry phenocrysts consist of alkali-feldspar with albite cores, clear quartz grains, and minor brown to clear Li-mica. Within the quartz grains or crystals, inclusions along planes of crystallization have been observed. The groundmass is aphanitic and consists of quartz, feldspar, and mica with vugs or vesicles. The vugs may be lined with quartz, feldspar, fluorite, cryolite, and li-mica crystals. Some vugs are filled with kaolinite or fluorite and are surrounded by coarsely crystalized minerals. The vugs occur in bands and can be locally clustered in isolated locations. Late-stage fractionation of volatile components, such as F, CO_2 or H_2O, from the crystallizing rhyolite probably formed these vugs.

Round Top Peak displays some pegmatitic characteristics, including an abundance of cryolite, lithium rich micas, rutilated quartz and vapor rich fluid inclusions (Price et al., 1987). Peralkaline rhyolites and pegmatites can contain an abundance of incompatible elements including REEs. The Round Top Peak rhyolite is enriched in incompatible elements including Li, F, Rb, Y, Zr, Nb, Sn, Ta, Pb, REE, Th, and U.

Isolated zones of brown rhyolite are present and are often related to fault structures or near the contact between the rhyolite and sedimentary rocks. In these brown zones, the iron minerals are replaced by goethite and limonite giving the rhyolite a brown color. Tan rhyolite is found along the contact between the rhyolite and sedimentary rocks. Tan rhyolite can also occur as mottling in the red and pink rhyolites located near mineralized faults and the contact between the intrusive and sedimentary rocks. The tan rhyolites were probably altered by vapor phase or hydrothermal fluids and consist of kaolinite clay and residual quartz phenocrysts. Magnetite and hematite are absent or present in only trace amounts. Degree of alteration varies and can be represented by a complete replacement of the feldspars by kaolinite to a partial replacement. Multiple colored fluorites often occur as fracture fillings and replacements in the tan rhyolites that contact the sedimentary rocks.

REE distribution and grades were not affected by the hematitic alteration of the rhyolite. However, the vapor phase or hydrothermal alteration of the tan rhyolite had an impact on the REE grade. The more intensely altered tan rhyolite zones can have a lower REE grade than the other four rhyolite phases.

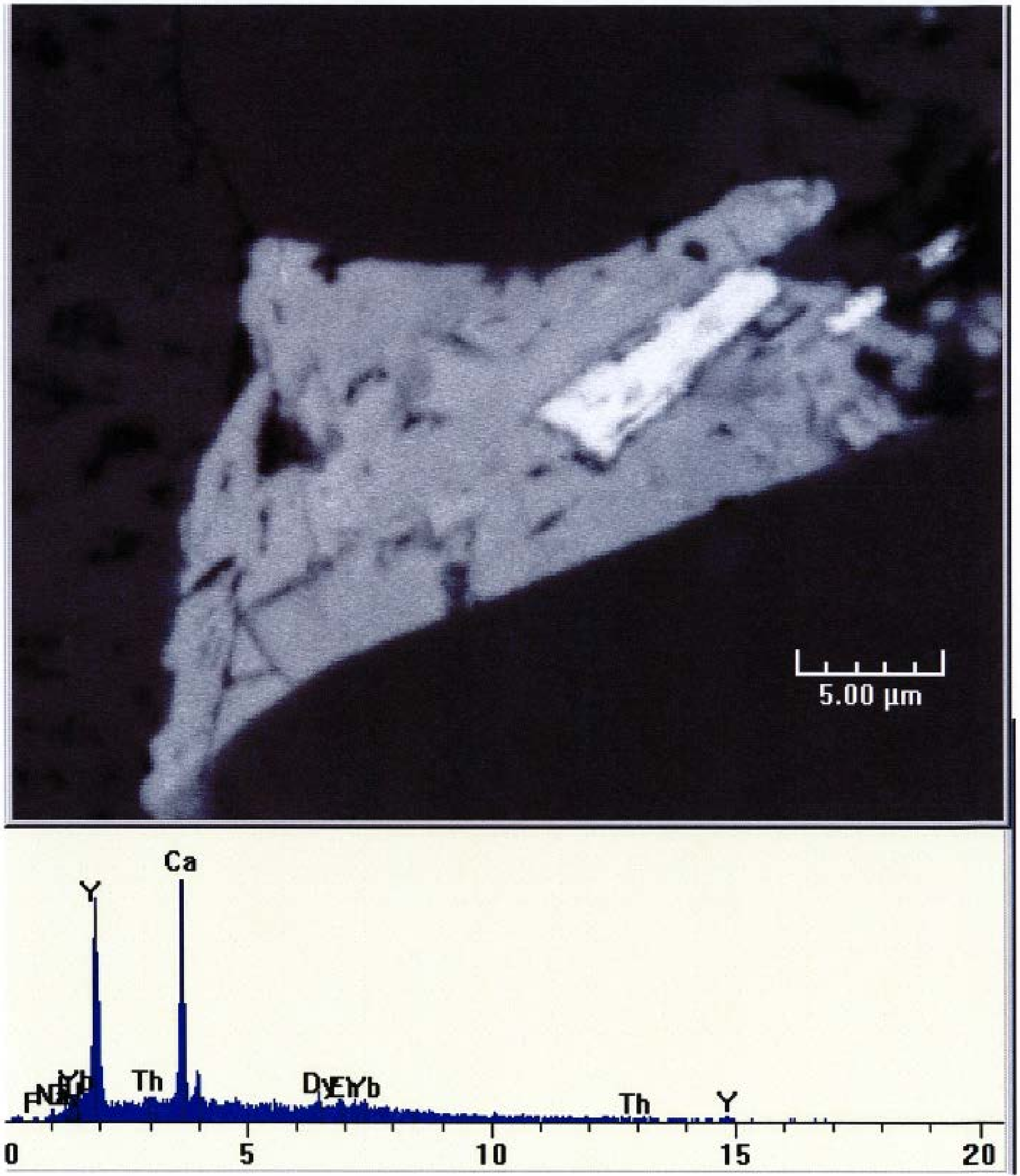
7.4.1 Mineralogical Studies

Mineralogical studies on Round Top Peak have been conducted by a number of past workers including Rubin et al. (1987), Price et al. (1990), Rubin et al. (1990), and McAnulty (1980). Additional studies were undertaken by TRER as part of a preliminary metallurgical study. Major phases making up about 90-95% of the rhyolite volume are represented by albite, potassium feldspar and quartz. Accessory minerals are dominated by trioctahedral Li-mica, Fe-rich biotite, magnetite altered to hematite, zircon, and cryolite. The rhyolite is enriched in incompatible elements consisting of Li, Be, F, Zn, Rb, Y, Zr, Nb, Sn, Pb, U, Th, and HREEs and LREEs. These elements formed a variety of accessory minerals disseminated throughout the rhyolite intrusion with the REE-bearing minerals being the most important. QEMSCAN analysis by Hazen Research indicates that an yttrium-rich fluorite (Yttrofluorite) is the main host of yttrium and REEs. The yttrium-rich fluorite is fine-grained, usually less than 10 micrometers in diameter but as large as 40 micrometers. Some of the fine fluorite is encapsulated in silicate gangue.

Table 7-2 Rare Earth Minerals Identified from Round Top

Mineral	Formula	Specific Gravity	Hardness	Substitution and Trace Elements
Yttrofluorite	(Y,HREE, Ca)F_{3-x}	3.18	4	A variety of fluorite, Y HREE and LREE substitutes for Ca
Yttrocerite	(Y, HREE,LREE,Ca)F_{3-x}	3.18	4	A variety of fluorite, Y and Ce substitutes for Ca,Y+Ce/Ca 1:5 other REE in minor amounts
Xenotime	(Y, HREE)(PO_4)	4.4-5.1	4-5	
Bastnaesite	(Y, Ce,La)(CO_3)F	4.90 – 5.2	4 - 4.5	Other REE can substitute for Y,Ce, and La in minor amounts
Ancylite(La)	Sr(La,Ce)$(CO_3)_2$(OH).H_2O	3.95	4-4.5	None known
Cerianite (Ce)	(Ce^{4+},Th)O_2	7.21	not determined	Other REE can substitute for Ce along with Nb, Ta, and Zr
Cerfluorite	(Ce, LREE, Ca) F_{3-x}	3.18	4	A variety of fluorite REE Substitute for Ca
Aeschynite-(Ce)	Ce,Ca,Fe)(Ti,Nb)$_2$(O,OH)$_6$	4.2-5.34	5-6	Th can substitute for Ce

Round Top rhyolite is enriched in HREE with up to 70% of the total REE grade being HREEs. The most common rare earth minerals are yttrofluorite, cerfluorite and yttrocerite, which are varieties of fluorite. These fluorite varieties contain mostly HREE and yttrium where the REEs substitute for the Ca sites in the fluorite crystal lattice. Samples examined by Price et al. (1990) and submitted for a metallurgical study contracted by TRER showed the presence of these REE fluorite varieties. Most of the HREEs that occur at Round Top are probably found in these varieties of fluorite. An example of yttrofluorite is shown in Figure 7-3.



Backscatter image of yttrofluorite between quartz/feldspar. Bright, elongated inclusion is rich in Th, La, Ce and significant Sr, indicating possible ancylite (?) - 3000X.

Figure 7-3 Photo Micrograph of Yttrofluorite Crystal

The metallurgical study conducted for TRER showed bastnaesite to be present in several of the submitted samples. Bastnaesite is a LREE mineral and most of the LREE found at Round Top are most likely in this mineral and in the fluorite variety cerfluorite.

Xenotime is not as common as the fluorite varieties or bastnaesite; this mineral was identified by Price et al. (1990) in four out of 15 samples. Xenotime was not identified in the samples submitted for metallurgical study. This is a rare mineral at Round Top Peak and reflects the low phosphate whole rock composition of the rhyolite. . Xenotime is a Y and HREE mineral that when present, in spite of its rarity, can contribute to the HREE grade.

Ancylite-(La), cerianite-(Ce) and aeschynite-(Ce) are rare minerals at the Round Top Project and have been identified from a few samples. Ancylite-(La) and cerianite-(Ce) were not recognized by past investigators but were tentatively identified from samples submitted for preliminary metallurgical testing. Rubin et al. (1987) identified priorite from one sample, which is a variety name for aeschynite-(Ce). Aeschynite-(Ce) was identified in one sample from a mineralogical study on Round Top Peak conducted by the University of Texas, Austin Department of Geological Sciences. The rarity of these minerals implies they are not major contributors to the total REE grade at Round Top Peak.

The rare earth minerals are evenly distributed throughout the rhyolite intrusion as finely disseminated grains. Scanning electron microscope (SEM) backscatter images show the grain sizes vary from <5 microns to >100 microns. SEM images show the rare earth minerals occur as interstitial fillings and coat earlier crystallized phases. These minerals are often associated with other accessory minerals that crystalized from other incompatible elements. The even distribution of the rare earth minerals and their occurrence as interstitial fillings and grain coatings suggest these minerals crystallized from a fluid that fractionated from the crystallizing rhyolite intrusion. Most of the REE minerals occur as varieties of fluorite, suggesting the REEs were transported as fluorine complexes in the fractionated fluid.

7.5 Alteration

The Round Top rhyolite was divided into five different alteration phases based on the intensity of hematitic and hydrothermal alteration: unaltered gray rhyolite, pink rhyolite, red rhyolite, tan rhyolite and brown rhyolite. Hematitic alteration is a replacement of the magnetite by hematite and gives the rhyolite a red to pink color. Hydrothermal alteration was late and gives the rhyolite a tan to brown color.

The gray rhyolite represents essentially unaltered rhyolite and has a slightly finer grain size than the red and pink rhyolite zones. The gray rhyolite appears to have less interstices and vugs than the red and pink zones. The volatile components that influenced the red and pink zones were still evolving and fractionating from the melt when the gray rhyolite was crystallizing. Gray rhyolite may have red mottling and/or a light pink color flow-banding that suggests separation of a volatile phase during emplacement of the rhyolite which partially oxidized the magnetite and deposited REE minerals. These mottled and banded sections are often located near the transition zones between the gray and red/pink rhyolites.

The pink rhyolite also underwent hematitic alteration but not as strongly as the red rhyolite. An abundance of interstices and vugs have been observed in this zone. The contact between the red and pink rhyolite is gradational and not well defined. Pink rhyolite can be mottled with red and gray rhyolite, especially near the transition zone between the different alteration phases. The abundance of interstices and vugs was probably caused by a high concentration of volatile components entrapped in the cooling rhyolite magma. These trapped fractionated fluids deposited REE fluorite varieties in interstices and vugs and caused the oxidation of magnetite to hematite.

Tan rhyolite is commonly found along the contact between the rhyolite intrusion and underlying sedimentary rocks. Tan rhyolite mottling and stringers can be found in the red, pink and gray rhyolite zones that are adjacent to the tan rhyolite zone and hydrothermally altered faults. Rhyolite in this zone underwent intense alteration: the feldspars and mica may be completely replaced by kaolinite leaving unaltered quartz phenocrysts. Hematite and magnetite are partially or totally absent or can be replaced by goethite. Tan rhyolite developed from different degrees of vapor phase or hydrothermal alteration. As a result of this type of alteration, secondary fluorite, chalcedony and minor amounts of uranium minerals can be found in this zone.

Brown rhyolite is the least common alteration phase found on Round Top Peak. Brown rhyolite can be found adjacent to the contact between the rhyolite intrusion and hosting sedimentary rocks, or adjacent to open fractures and faults. This alteration phase occurs as thin zones and lenses and may be associated with the tan rhyolite. Feldspars are partially replaced by clay, and secondary fluorite may be present in isolated locations. The brown color is caused by an abundance of disseminated limonite replacing magnetite and hematite. Brown rhyolite probably developed from ground water passing through open fractures and traveling along the contact between the rhyolite and sedimentary rocks. Perched ground water was encountered in some drill holes on the flanks of Round Top Peak and brown rhyolite was found above these zones.

8 DEPOSIT TYPE

The rhyolite itself comprises the REE mineralized body. Magmas with a peralkaline composition are known to have high concentrations of incompatible elements such as U, REE, Th, and Zr. Incompatible elements that occur at the Project are reported by Rubin et al. (1987) to be Li, Be, F, Zn, Rb, Y, Zr, Nb, Sn, REEs, Th, and U.

The rhyolite magma that developed Round Top Peak probably cooled too quickly to develop a coarse-grained texture or to develop zones with high REE concentrations. A quick cooling rate would cause a fine-grained texture of the rhyolite and even distribution of the REE minerals. The rhyolite magma was saturated in fluorine, which is reflected in the high percentage of fluorine accessory minerals that are distributed throughout the rhyolite mass. As the magma cooled, fluorine saturated fluids exsolved from the crystallizing magma. These fluorine rich fluids accumulated in interstices and vugs between the earlier crystallized minerals and deposited REE minerals and other accessory minerals in the interstices. The REE deposit at Round Top Peak can be classified as quartz saturated peralkaline (A-1) granite with a rhyolitic texture and a composition similar to certain pegmatites.

9 EXPLORATION

TRER has been conducting exploration activities in the district and on Round Top Peak since January 2010. Exploration consisted of surface sampling, logging cuttings from historical reverse circulation (RC) drilling, aeromagnetic survey, aeroradiometric survey, stream sediment survey, a gravity survey, and RC and core drilling.

9.1 Surface Sampling

Surface samples were taken at the beginning of the program in January 2010 to confirm the data that was published by past investigators. These samples were taken from outcrops exposed on historical drill roads on the north side of Round Top Peak. A chip sample was taken from each type of rhyolite alteration phase and submitted to Activation Laboratories for REE analysis. A total of six samples were submitted for analysis and analytical results confirmed the data published by past investigators.

9.2 Logging Historical RC Cuttings

RC cuttings from a drill program conducted in the 1980s by Cyprus were stored in the exploration decline on the north side of Round Top Peak and represent almost all their drill holes. These RC cuttings were removed from storage and logged by TRER geologists using a binocular microscope. Samples for analysis were selected and split from the stored RC cuttings. The samples were analyzed for REEs and selected samples were analyzed for uranium and beryllium. A total of 1,227 samples were submitted to ALS Chemex for analysis.

9.3 Aeromagnetic and Aeroradiometric Survey

An aeromagnetic and aeroradiometric survey was conducted by Aeroquest Airborne during the month of May, 2011. The purpose of the survey was to map the magnetic and radiometric characteristics of the Round Top and Little Round Top rhyolite intrusive complex and explore for additional REE mineralized intrusions in the area surrounding the project. The survey acquired about 616 line kilometers of magnetic gradiometer and radiometric data using a Bluebird Heli-TAG tri-axial gradiometer system and RSI gamma ray spectrometer system. Radiometric and magnetic data were compiled and interpreted by Thomas V. Weis and Associates.

9.3.1 Summary of Results of Aeromagnetic and Aeroradiometric Survey

The total aeromagnetic intensity reduced to pole, shown in Figure 9-1, generally displays magnetic high responses for Round Top, Little Round Top and Little Blanca Mountain. At Round Top and Little Round Top, the magnetic responses are near surface and cut off at depth. This suggests there is no feeder zone directly under these two peaks and drill data also indicate the shallow nature of the intrusions with no feeder dike being encountered. To the southeast of the Round Top intrusion and located between Sierra Blanca Mountain and Little Blanca

Mountain, there is a deep-sourced magnetic anomaly. This magnetic anomaly may be caused by the local magma source for the Round Top and Little Round Top intrusions. Sierra Blanca is generally nonmagnetic.

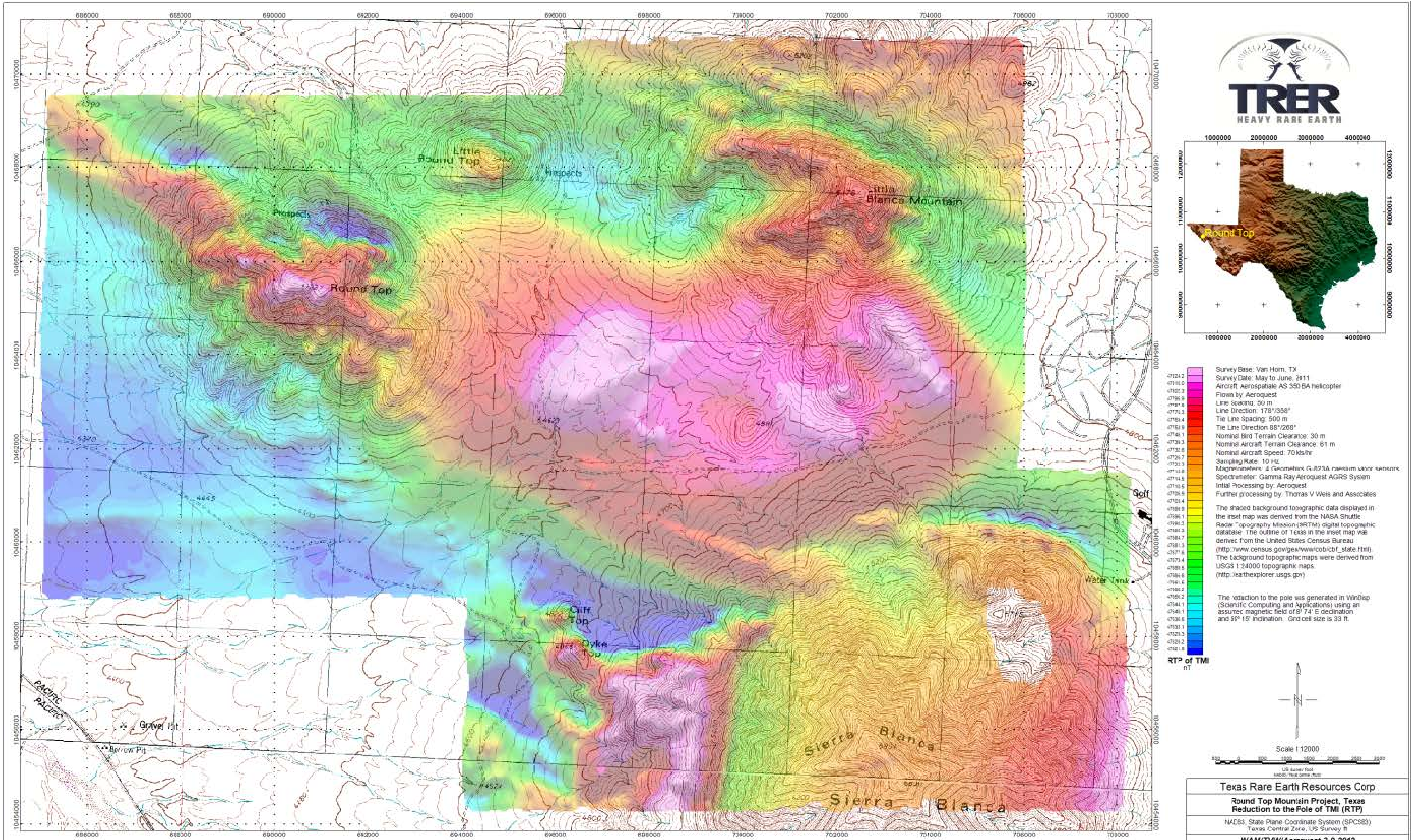


Figure 9-1 Aeromagnetic Map of Total Magnetic Intensity Reduced to Pole

Gamma ray spectrometer data, shown on Figure 9-2, can be used to map lithology and structure in the survey area. Between the Little Blanca Mountain, Round Top, and Little Round Top intrusions to the north and the Sierra Blanca intrusion to the south there is a major radiometric contrast. Radiometric data indicates the southern area is low in thorium. In contrast, the peaks to the north are high in thorium. The contact between these two areas is the drainage in Blanca Flats which could be interpreted to be a major east west structural zone. Round Top and Little Round Top have characteristic circular radiometric responses that map the rhyolite intrusions. Little Blanca Mountain has a generally noisy radiometric character that is not directly associated with the shape of the intrusion. Sierra Blanca has no direct radiometric response.

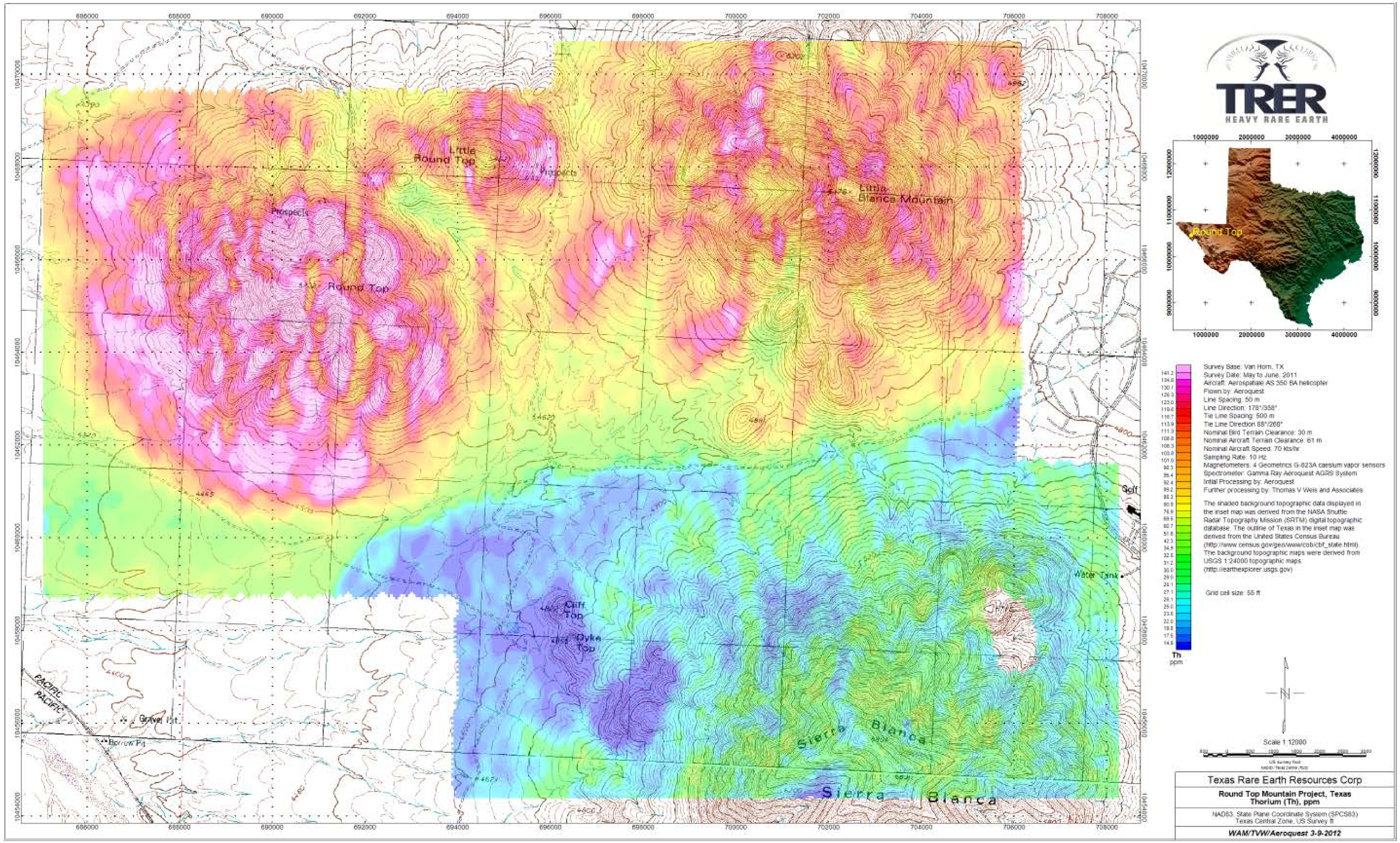


Figure 9-2 Aeroradiometric Map of Thorium Distribution

9.4 Stream Sediment Survey

A stream sediment survey was conducted on Round Top Peak and the other peaks in the area in the winter and spring of 2011. The purpose of the survey was to determine the distribution of REEs in the rhyolite complexes and locate possible beryllium and uranium deposits associated with the rhyolite intrusions. The survey was conducted by MLS International and the results were compiled in a report received by TRER October 28, 2011.

9.4.1 Summary of Results of Stream Sediment Survey

Total stream sediment samples taken from drainages defined zones of potential mineralization exposed in contacts between the rhyolite and sedimentary rocks. Indicators for mineralization were defined to be F greater than 1% and some combination of Be, Pb, Zn, As, and U. These indicators were used to delineate a wide zone of potential beryllium and uranium mineralization along the north flank of Little Blanca with some potential on the east flank. This mineralization would be confined to the contact between the rhyolite intrusion and the sedimentary rocks. REEs were found to be evenly distributed in the sampled drainages, indicating the uniform distribution of REEs in the rhyolite intrusions.

9.5 Gravity Survey

A gravity survey was conducted on the Round Top Peak and the surrounding area from September to October, 2011. The purpose of the survey was to map lithologic variations and structure in the project area. Focus of the survey was on the late-stage rhyolite units related to the REE mineralization at the Round Top and Little Round Top complexes. In addition, the survey will be used to explore for additional rhyolite intrusive complexes associated with mineralization in the surrounding area and at depth. The survey was conducted by Magee Geophysical Services. The survey was conducted on a 100 meter grid using three Lacosta and Romberg Model-G meters. Compilation and interpretation of the data was conducted by Thomas V. Weis and Associates.

9.5.1 Summary of Gravity Survey Results

Gravity survey results shown in Figure 9-3 show the rhyolite as gravity lows and sedimentary rocks as gravity highs. A gravity low occurs along the axis of Round Top Peak and is associated with the low density of the rhyolite. A similar low occurs on the Little Round Top intrusion. Another gravity low occurs to the south of Round Top and does not have a topographic expression. A gravity low extends from the north side of Round Top to the southeast and merges with a gravity low trending south from Little Round Top. From the juncture, a linear gravity low, coincident with a probable NW-striking fault that goes through the saddle between Round Top and Little Round Top, continues to the southeast into a general gravity low coincident with the buried magnetic high anomaly. The linear gravity lows may be rhyolite dikes and sills that fed the laccoliths from a buried central intrusive body in the district, marked by the coincident magnetic high and gravity low beneath the valley surrounded by the four Sierra Blanca peaks. To the northeast of the project area, an anomalous gravity high was defined which may be a thick section of sedimentary rocks, such as limestone. Refer to Sections 10 and 11 for further descriptions of sampling.

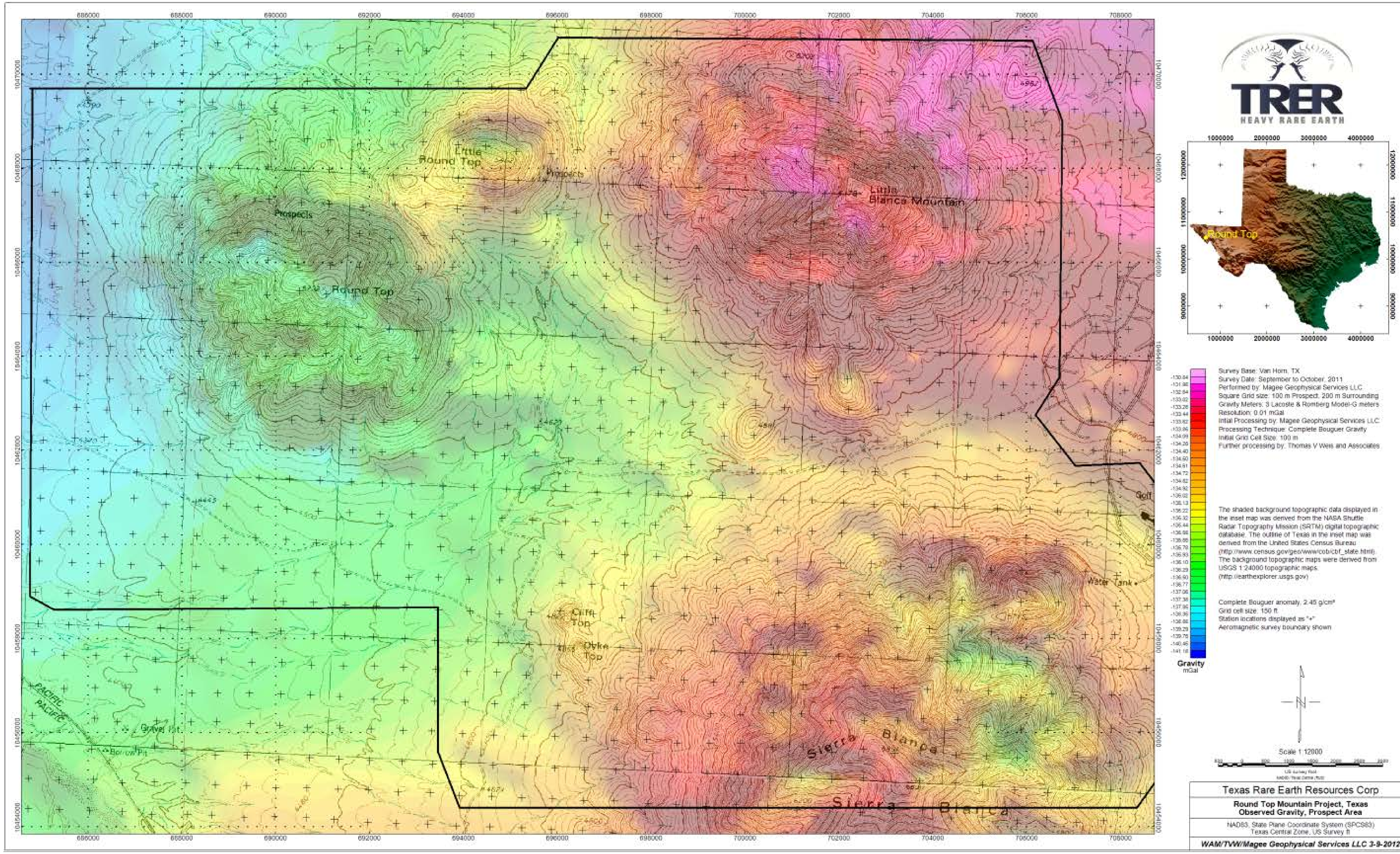


Figure 9-3 Map of Observed Gravity Values

10 DRILLING

10.1 Introduction

The drilling data from previous operators in the Round Top area had not been consistently maintained. Ninety-five of the 173 locatable holes were not used in the mineral resource estimate due to lack of verifiable assay or geologic information.

Though incomplete, reliable data begins with Cyprus's 1987 campaign which consisted of 44 identifiable RC holes totaling 9,262 ft and 2 diamond core holes totaling 347 ft. This drilling was mostly confined to the north side and flank of the mountain where the contact between the rhyolite and basal sedimentary rocks is exposed (Figure 10-1).Collar locations of some of these drill holes were preserved on maps made available to TRER by the GLO. Cyprus RC cuttings were kept in plastic sample bags that were stored in barrels in the decline; many of these cuttings were logged and sampled by TRER in 2010.

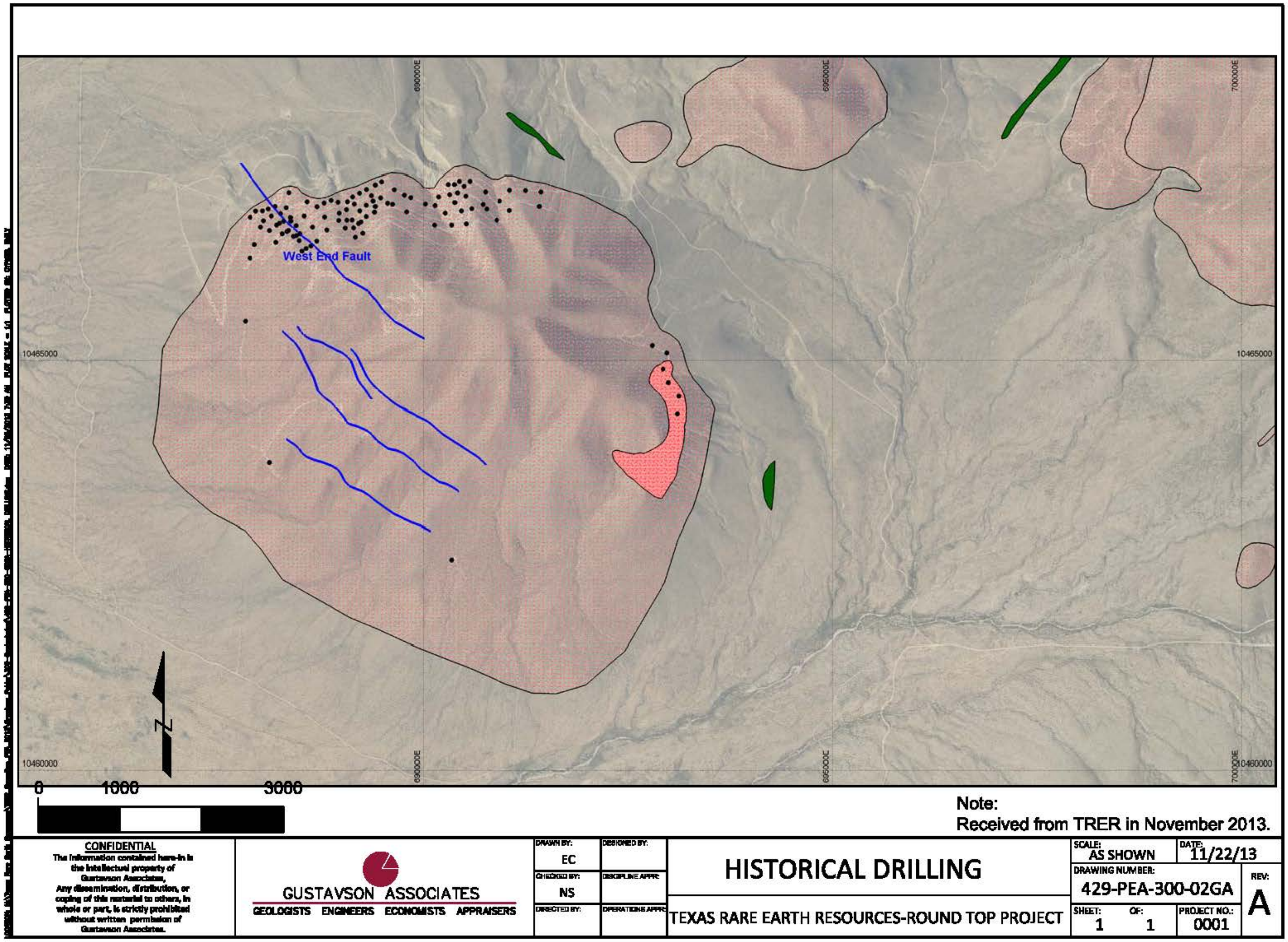


Figure 10-1 Historic Drill Hole Locations on Round Top Peak

TRER drilled an additional 64 RC holes in 2011 totaling 26,915 ft. This campaign was designed to 1) define the extent of the Round Top rhyolite; 2) validate historical drill data; and 3) provide sample support for the geologic and resource models.

In 2012, an additional 16 RC holes and 2 diamond core holes were completed. Of the 18 new holes, totaling 10,483.5 ft, all but one was assayed. Assay results and drilling logs were received by Gustavson in January, 2013. Drilling Procedures and Conditions

10.2 Drilling Procedures and Conditions

Round Top Peak is steep and consists of highly fractured, variably altered rhyolite. Drill sites are prepared by leveling a pad and digging a sump for the drill rig if necessary. Drill holes at the Project are typically collared in bedrock or in rhyolite-derived alluvium farther out on the plain. Ample water from wells is available for drilling. The water table has not been intersected by the drill holes, although rare small perched groundwater intervals have been encountered.

RC methods were used for nearly all the drilling at the Project to date. TRER's RC drilling was generally carried out with either a pneumatically-driven downhole hammer (generally in less-fractured rock) or a Tricone RC bit (generally in more-fractured rock). Hole diameters were 5.25 inches and all drilling was done wet except when the top 15-20 ft of the hole was being cased. After completing a hole, all material and waste were removed from the site. The holes were allowed to cave in and were filled and covered with soil and cuttings.

TRER's core drilling at the Project has been advanced with NQ, HQ, and PQ size core (1.875, 2.5, and 3.345 in. diameter, respectively). As the core program is in its initial stages, with only one hole completed and a second one in progress, results are preliminary. Drilling had been difficult for the first 200 ft with excessive water and drill fluid loss due to the highly fractured bedrock. The first two hundred feet are now drilled with an RC rig and PW casing is put down. The PQ core recovery below that depth now commonly ranges to 95+% and five foot long runs of intact core have been obtained. The current core holes are twinning previous RC holes and a comparison of REE values in samples generated by the two methods will be forth coming. The location of TRER drill holes are shown in figure 10-2 below.

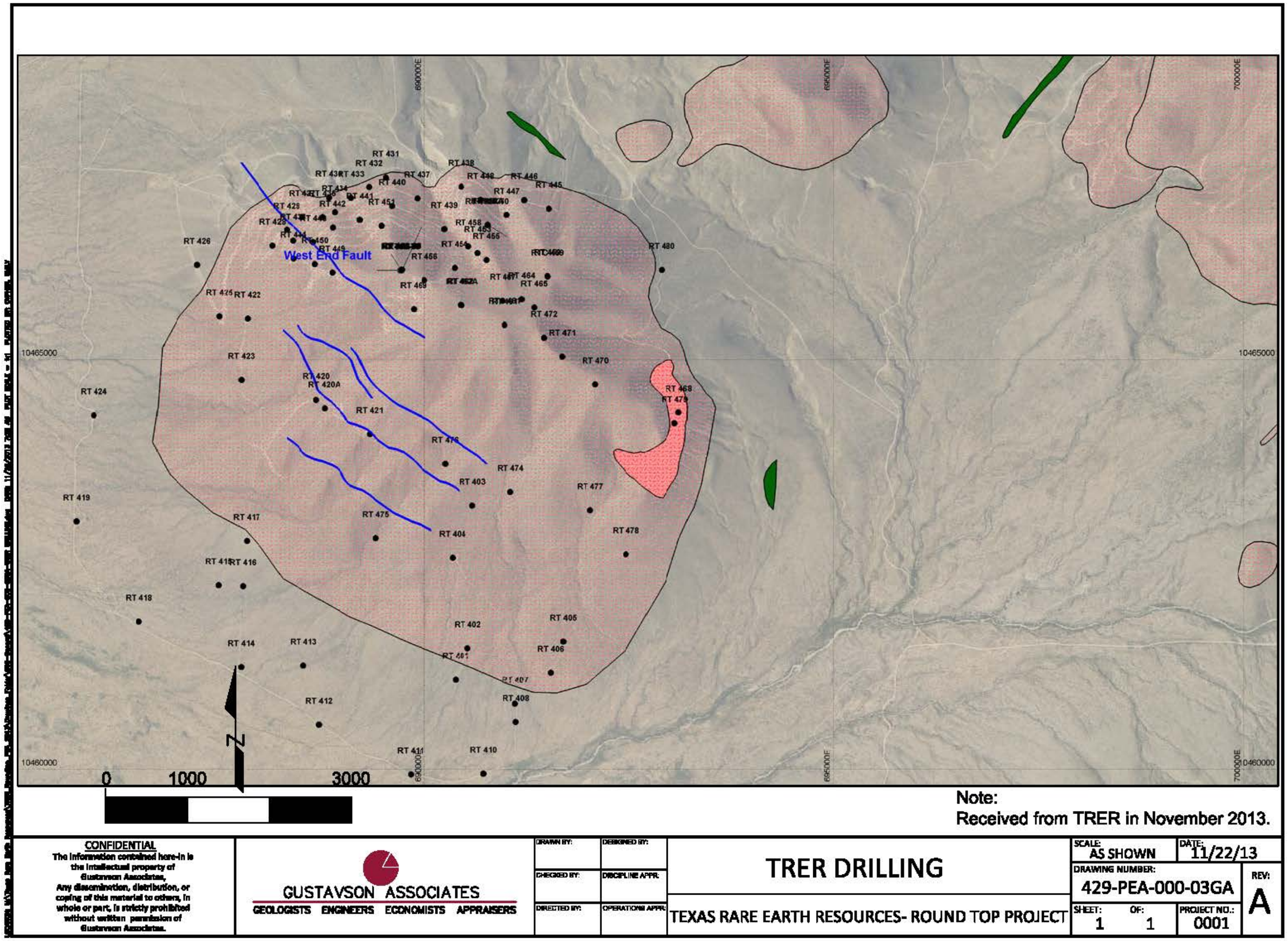


Figure 10-2 TRER Drill Holes

10.3 Drill Hole Collar Surveys

Location information of Cabot drill holes is not available. Cyprus drill holes were plotted on maps and many have been located and surveyed in with GPS. All TRER drill hole collars have been surveyed with a Trimble GeoExplorer 6000 series GeoXH model hand-held GPS unit capable of submeter horizontal accuracy. Elevations are commonly taken from topographic maps or digital elevation models. Coordinates are converted for database entry to Texas Central State Plane system in feet using NAD 83 datum.

10.4 Drill Hole Logging

RC chips were logged on site in field notebooks as the hole was drilled, with field notes later entered into Microsoft Excel. A representative split from each sample run was kept in a chip tray; trays were labeled with the drill hole number and interval, and are stored at the Sierra Blanca field office. An additional 100 drill holes, or portions thereof, from previous drilling campaigns were relogged to be consistent with terminology used by TRER.

Core geotechnical logging, RQD analysis and recovery determination are performed at the drill site. Then the core is transported to a core warehouse in Sierra Blanca, where it is logged by depth for color, textures, structures and mineralogy by TRER geologists.

10.5 Downhole Survey

All currently drilled RC and core holes are surveyed for downhole deviation using a reflex gyro instrument (RT 452-A, -A60, -A70). The instrument reports accuracy within +/- 0.2 degrees and can survey vertical holes. Cyprus's drilling campaign used vertical holes which were not downhole surveyed.

10.6 Extent and Results of Drilling

Drill hole spacing at ground surface is more closely spaced on the north side and flank of the mountain, ranging from 200 – 800 ft and averaging 400 – 500 ft, with drill hole spacing spreading out to over 2,500 ft on the alluvial fan. Little rhyolite was encountered on the alluvial fan and future drilling in this area of the Project, at its current density, should be considered for reconnaissance purposes.

Drill data show that the rhyolite was extensively faulted and displaced by normal faults with up to 100 ft displacements. A number of these faults have been mineralized by fluorite and chalcedony. Thickness of the rhyolite increases to the south and east and extends into the sedimentary rocks beyond the surface expression of the rhyolite.

Historical Cyprus drill holes that were twinned by TRER and resulted in identical lithologic logs were included in the resource model. Historical holes that did not correlate with the twinned holes were rejected from the model.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Reverse Circulation Procedures

11.1.1 RC Handling Procedures

RC cuttings were collected from the splitter by the geologist and/or geologic technician for every 5 ft interval. Cuttings were collected in buckets that were lined with sample bags. Both sample bags and buckets were labeled with the hole number and with the start and finish of each sample interval. The number of buckets for each sample interval was logged and each sample was marked with a bucket number.

Buckets were closed and sealed on-site by the geologist, geologic technician or drill helper. Buckets were transported to the sample processing/storage facility, a warehouse in El Paso, Texas. The warehouse is posted restricting no unauthorized personnel in the storage/processing area, and employees are aware of this policy. The warehouse was locked and bolted at all times when not occupied.

Hole number(s) and footages on each bucket label are checked against the contained samples. Each bucket's samples are lined up in rows by hole and drill run. The drill site log for the number of buckets per interval is checked to verify all samples were transported to the warehouse.

Wet sample bags were placed on drying racks located outside the warehouse in a locked gated enclosure adjacent to the warehouse. In the summer months, the samples are air dried without added heat. In the winter months, heaters were placed under the racks, which were covered with plastic tarps.

The dry sample bags were put back in the buckets and stored at the warehouse facility in El Paso. Overflow from the storage space in El Paso was transported to Sierra Blanca and stored in a large metal building near the Round Top Project. Security at the property is provided by a watchman at the property entrance or, on inactive days, a locked gate.

11.1.2 RC Sample Preparation Procedures

Dried samples are weighed and the total weights for each sample interval are entered into a spreadsheet, from which percentage recovery is determined.

Initially, each sample representing five feet of drilling was made into a single sample. Where there were multiple buckets for a sample interval, the buckets were combined into a single sample, which was split using a Jones riffle splitter into a one kg sample and placed in a plastic bag.

Later in the program, when uniform concentrations of REEs had been confirmed, five foot sample intervals were composited in 10 to 30 foot intervals based on lithologic characteristics determined by the geologic logging. For a single lithology, up to six samples were split and composited into approximately a 2 kg sample.

The bags were weighed and labeled with a sample number, without footage being indicated, and these data were entered into a spreadsheet. Blanks, duplicates and standards were inserted at various intervals and receive a sample number in sequence.

All samples were prepared by ALS Chemex in Reno, Nevada, and analyzed by ALS Chemex, a certified laboratory in Vancouver, B.C., Canada, by inductively-coupled plasma mass spectrometry (ICP-MS).

11.2 QA/QC Procedures

For control purposes, one or two blank samples of barren material were included with each batch of 10 to 20 samples. At least one blank sample was included per hole. The blank samples comprise limestone or shale cuttings from the bottom of RC holes.

One standard was put in the sample stream every 20 samples to independently assess laboratory performance. Standards were made from the composited samples of one RC drill hole and prepared by Shea Clark Smith, Minerals Exploration & Environmental Geochemistry.

Duplicate samples were put in the sample stream at a rate of one per 10 to 20 samples to assess the reliability of the grade determination. ALS Chemex also included in-house blanks, standards, and duplicates in each batch of samples. TRER's inserted blanks, duplicates and standards were statistically compared with ALS Chemex's internal QC procedures. No variations were detected between the two procedures. Duplicate samples have been analyzed by ICP-MS by AcmeLabs, a certified laboratory in Vancouver, B.C., Canada and Actlabs, a certified laboratory in Ancaster, Ontario, Canada.

11.3 Sample Shipment and Security

Samples were securely bagged and packed in cardboard shipping boxes, with each box containing 10 to 15 samples. Each box contained a list of its contents and was numbered on the outside as one of the total number of boxes in that shipment. The outside of each box was labeled with the laboratory's and TRER's addresses. An analytical request form was submitted with each batch of samples.

Boxes were shipped by a commercial carrier to ALS Chemex in Reno, Nevada, for sample preparation and analysis. When the boxes arrived at the lab, a work order number for the batch was assigned and sample numbers recorded. Sample receipt verification was sent back to TRER.

11.4 Core Handling Procedures

TRER uses the following core handling, logging, and sampling procedures:

Core was placed by the drill helper in a labeled 4 ft long cardboard core boxes, from left to right, with the start and finish of each run labeled on a wooden block. After geotechnical logging, TRER personnel transport the core to the core logging facility, and lay it out in order of increasing hole depth.

The core logging facility was a secured building located four blocks from the field office in Sierra Blanca, Texas. Only authorized personnel were permitted to enter the facility. The building was locked and bolted at all times when not occupied.

Core box labels were checked for accuracy, and aluminum labels recording hole number, box number and depth interval were affixed to the boxes. All core was stored inside the logging facility in Sierra Blanca.

11.4.1 Core Logging Procedures

Paper forms, including location, date drilled, diameter, azimuth, dip, fracture counts, density, and recovery, were used for logging. These data were entered into spreadsheets designed for each data set. These include spreadsheets for geology, recovery, density, sample numbers, and engineering data.

Core was washed and logged for lithology, textures, structures, mineralogy and color by TRER geologists. All cores were photographed in the box after the drilling mud and fluids have been washed from the core.

11.4.2 Core Sampling Procedures

At the TRER core facility the drill holes were continuously sampled on five foot intervals.

Sample intervals were marked on the core and boxes with a lumber crayon by a TRER geologist. A labeled aluminum sample tag was stapled to the interior of the sample tray at the beginning of each sample interval. The core was cut in half with a water-cooled diamond-bladed saw. Once sawed, one half was returned to the core tray and the other half was placed in a labeled sample bag. Before the sawed half was placed in the sample bag, the sample interval was checked against the sample interval recorded on the sample bag.

Some samples were additionally used for metallurgical tests, which required that one of the sawn halves be halved again to create quarters. Quarter core was submitted for the metallurgical tests while the remaining quarter was retained for the geologic record.

11.4.3 Core Sampling QA/QC Procedures

QA/QC procedures for core samples are the same as RC cuttings, with blanks, standards and duplicates submitted about every 20 samples.

11.4.4 Core Sample Shipment and Security

Securely bagged samples were placed in boxes, with approximately 10-15 samples per box. Each box contains a list of its contents and was numbered on the outside as one of the total number of boxes in that shipment. The outside of each box was labeled with the laboratory's and TRER's addresses. An analytical request form was submitted with each batch of samples.

Boxes were shipped by a commercial carrier to ALS Chemex in Reno, Nevada, for sample preparation and analysis. When the boxes arrived at the lab, a work order number for the batch was assigned and sample numbers recorded. Sample receipt verification was sent back to TRER.

11.5 Specific Gravity Measurements

Specific gravity measurements were taken from the core at the core logging facility in Sierra Blanca. Since there are no core drying facilities available, the measurements being taken were for wet core. It was recommended that these measurements be confirmed and competed for dry core at an independent laboratory. The average wet density, as established at the core facility, is 2.7 grams per cubic centimeter (g/cm^3). An independent laboratory determined the dry density for the crushed rock quarry on Sierra Blanca Peak to be 2.53 g/cm^3.

11.6 Historic Drill Holes

No information is available concerning the sampling and assaying methods used in the historical drilling conducted by Cabot and Cyprus. When the property was shut down, the cuttings from the Cyprus RC drilling program were stored in barrels in the exploration decline. The samples are in plastic bags that were placed in sealed barrels, covered with plastic sheets and strapped to wooden pallets.

Since no accurate logs of the historical drill holes or assay results can be located, it was decided to make detailed logs of the historical drill holes. During the detailed logging, certain drill holes and isolated intervals were selected for assay. To facilitate the logging, the pallets were removed from the mine and broken down. The individual barrels were returned to the mine and lined up along the right rib.

The barrels were systematically opened and the individual sample bags removed. Most of the individual samples were in plastic bags and represented a few pounds of cuttings. Some intervals were much larger and contained up to 20 pounds or more material. In some barrels, the top layer of samples was poorly preserved and the bags were deteriorated from sun damage. Other barrels were filled with water from being left open in the rain before they were placed in the decline. Most of these samples were salvaged and placed in new plastic bags and labeled with the proper hole number and interval. Some samples were lost due to the deteriorated nature of the sample bags and others could not be identified.

When the samples were removed from the decline, they were transported to a motor home near the property gate that was converted to a logging facility. At the logging facility a portion of the sample was washed in a screen and placed in a chip tray labeled with the hole number and interval. The chips were allowed to dry and were examined with a binocular microscope. The sample bags were checked for radioactivity and intervals with over three times (3X) the background level was noted. Geologic data was entered into a spreadsheet.

Holes and intervals were selected for assay based on the known location of the hole and observed mineralization in the RC chips. Hole intervals with elevated radioactivity and intervals with suspected beryllium mineralization were selected for assay. Larger samples were split into two parts one part for assay and the other part was returned to the decline. In some cases there were not enough chips to take a split and the entire sample was submitted for assay. The sample split for assay was placed in a properly labeled bag with the sample number and interval. A tag with the sample number was placed in each individual bag. Sample numbers and corresponding intervals were entered into a spreadsheet. The sample bags were placed in shipping boxes and a label identifying the contents was placed in each box. An analytical request form was placed in one of the boxes for each batch of samples submitted to the laboratory. Samples were transported to ALS Chemex by a commercial carrier. When the samples arrived at the laboratory the sample numbers were recorded and assigned a work order number. Sample receipt verification was emailed to TRER. It the qualified person's opinion that the historical samples were prepared and handled in a manner consistent with industry best-practice standards and that the historical data used in the current Round Top Project resource model is valid.

A total of 1,227 historical drill samples from 67 drill holes, were reanalyzed.

It is the qualified person's opinion that the sampling, sample preparation and QA/QC procedures followed by TRER are consistent with best-practice industry standards.

12 DATA VERIFICATION

Dr. M. C. Newton, the qualified person for this Section of the report, has made six visits to the Project site during the 2011 and 2012 drilling programs. Mr. Newton made four two-week long trips to the site in 2011, a two-week long visit in March of 2012 and his most recent visit was for a week in May of 2012. Mr. Newton offered recommendations on QA/QC sampling procedures and observed and supervised both RC and drill core sampling from drill to courier.

As part of Mr. Newton's data verification procedure, he oversaw the review and comparison by employees of Gustavson of the certified laboratory reports from ALS Chemex with entries in the TRER database. It is the qualified person's opinion that the sampling, sample preparation and QA/QC procedures followed by TRER are consistent with best-practice industry standards.

Gustavson compared assay data provided by TRER with PDF assay certificates by ALS Minerals for all holes drilled by TRER, which were the 400 series holes (RT 401 – RT 480). There was no discrepancy between these data sources. The assay data for historical drill holes (200-300 series drill holes) were generated by TRER through reassaying and these data were similarly verified by cross-checking TRER delivered data with laboratory assay certificates. No discrepancies were found. Of the 173 historical drill holes, 95 were not used in the resource estimation due to incomplete assay or geological information.

12.1 Verification of the Quality Control Program

During the 2011 drilling program, for the RC sampling, all water was saved and no fines were lost as two-eight bag-lined buckets were used to capture all material from one of two ports on a rotary splitter. The qualified person took samples at the drill rig, transported samples to the warehouse in El Paso, placed sample bags to dry, split samples and supervised their boxing up for shipment and delivered them to the courier office.

Two standards were developed by an independent laboratory, Minerals Exploration Geochemistry of Washoe Valley, Nevada, by compositing 80 and 100 ft intervals of rhyolite from a single Round Top RC drill hole. The standards were well homogenized, not pulverized and split to 0.75 grams and placed in a plastic bag like the other RC samples. Multiple aliquots of the two standards were analyzed by three different laboratories by ICP-MS to determine a range of acceptable values.

Blanks are derived from limestone and shale RC samples that have been analyzed and are known to be barren of REEs. Duplicates of RC and core samples are taken periodically and inserted at random in the sample stream at some distance from the duplicated sample. All samples, standards, blanks and duplicates are given only a sequential sample number and all look like RC samples and are therefore blind to the laboratory.

It is Mr. Newton's opinion that the sample database used in the current Round Top Project resource model is valid for inclusion in resource estimation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

TRER has completed five stages of scoping level metallurgical testwork for the Round Top Project in Texas. The primary objective for the scoping level studies was to evaluate the various processing options for recovery of Rare Earth Oxides (REO) values contained in the resource.

Five sets of testwork were performed on various samples from the property at different metallurgical laboratories. They were:

1. Phase I – Preliminary Metallurgical Test Program on Round Mountain Project, MSRDI Report dated September 7, 2011 (Phase I Study).
2. Phase II - Progress Report No. 2 – Round Top, MSRDI Report dated January 5, 2012 (Phase II Study).
3. Phase III (a) - Beneficiation Study of Round Top, Texas, Rare Earth Element plus Yttrium Ore, Hazen Research, Inc. Report dated October 15, 2013.
4. Phase III (b) – Preliminary Data Package for a Hydrometallurgical Laboratory Process Development Study for the Round Top, Texas Rare Earth-Yttrium Ore, Hazen Research, Inc., Dated October 31, 2013.
5. Phase IV – Heap Leach Characteristics Studies, Resource Development Inc. Report "Results of Scoping Bucket Static Leach Tests" dated July 16, 2013 and Resource Development Inc. Report "Results of Preliminary Column Leach Tests" dated September 24, 2013.
6. Phase V – TRER Progress Summary, Tusaar Corp, Extraction of rare earth elements and separation of uranium and thorium from rare earth elements, report received at RDi November 2013.

These reports were reviewed and the findings are summarized and presented in this section.

13.1 Phase I Characterization

This phase consisted of characterization of several classes of material from the Round Top deposit. Five RC drill samples of rhyolite designated "red", "pink", "grey", "tan" and "brown" were examined analytically for rare earth oxides (REO) and mineralogically for bulk minerals. Preliminary attrition scrubbing tests were also run in this phase.

The results are summarized as follows:

1. Yttrium and dysprosium oxide values in the heads varied from 84 parts per million (ppm) to 199 ppm and from 26.5 to 38.2 ppm, respectively. Total Rare Earth Oxides (TREO) varied from 512 to 672 ppm.
2. The main gangue mineral was potassium feldspar, while the REO is contained variously in bastnaesite, yttrofluorite, yttrocerite, columbite, changbaiite and kasolite.
3. All of the composites were of similar grade and mineralogy.

13.2 Phase II Study

This phase evaluated several methods of potentially upgrading a composite sample (all five lithologies combined). These included gravity, magnetic and flotation methods. Two series of diagnostic leach tests were also performed on whole ore samples at different particle size suites.

The test results indicated the following:

1. Magnetic and gravity methods did not preferentially upgrade the material.
2. Flotation tests indicated that sulfonate collector gave better overall results than the fatty acids and amines. The best results indicated REO recovery of about 77% with 36% of the weight.
3. Leaching tests were run to evaluate hydrochloric, nitric and sulfuric acids, alkaline lixiviant and effects of temperature. The results for all of the acids were better than with alkaline conditions. The kinetics of leaching with acids was relatively fast and acid consumption was relatively low.

13.3 Phase III Study

The objective of this phase of study was to investigate Rare Earth Element plus Yttrium (REE+Y) recoveries and particularly Heavy REE (HREE) recoveries utilizing flotation, magnetic separation, and attritioning and gravity separation methods. The goal was to make a 10:1 concentration ratio at 75% recovery of the Total REE (TREE). Mineralogical characterization and comminution studies were also performed. Limited tests were also performed to evaluate leaching extraction of REE+Y.

The highlights of the test results indicated the following:

1. The head analyses of the four composites were from 0.029% to 0.031% TREE, 0.014% to 0.016% HREE and 0.22% Y.
2. Ball mill work index tests were conducted with a closing size of 75 microns (200 mesh) rather than the customary 150 microns (100 mesh). The BWi values varied from 14.6 to 17.6 kWh/t for the composites. Abrasion index tests were performed on two of the composites and were 0.9863 and 0.9070 grams.
3. Mineralogical examination identified the main mineral as a yttrium-rich fluorite with xenotime, bastnaesite and monazite as minor minerals. Minerals were closely associated all the way down to about ten microns, with some silica and zircon encapsulation observed in a leach residue.
4. Dispersion and attrition did not have positive effects with the material.
5. Gravity tests did not produce desired results.

6. Magnetic separation was marginally successful in removing 25% of the iron while rejecting only about 3% to 5% of the REE+Y.

7. Extensive flotation testwork was performed on the Barrel #10 and 53460-1 samples. General flotation conditions were established with a 270 mesh (51 microns) grind, two stage depressant (sodium silicate) and collector (oleic acid) conditioning and three stage rougher flotation. The results of that test were recoveries of 73% and 71% and upgrading ratios of 9.1 and 8.1 for yttrium and dysprosium, respectively.

13.4 Phase III (b) Study

The objective of this phase of the study was to investigate hydrometallurgical processes for extraction of REEs. These included acid bake-water leaches, acid leaches of whole ore and flotation concentrates, solid-liquid separation and treatment of leach solutions.

Highlights of the leaching part of the program are as follows:

1. The acid bake was optimized with a three hour bake at 325ºC and acid ratio of 0.22, resulting in a yttrium extraction of 94%.

2. The best sulfuric acid agitated leach tests were run at a 61 micron grind for 4 hours at 90-95ºC. The acid to ore ratio was 0.16. Extractions were 76% to 83% and 82% to 94% for dysprosium and yttrium, respectively.

3. Static leach tests were performed on minus one half inch crushed material with various sulfuric acid strengths. Yttrium extractions were the highest (up to 45%) with the highest acid strength.

4. Acid consumptions were evaluated for various agitated leach tests on whole ore and flotation concentrates. The results showed higher acid consumptions for flotation concentrates and finely ground and not deslimed whole ore samples.

Additional tests were performed to evaluate chemical treatment methods for pregnant leach solutions.

The highlights are as follows:

1. The resins, including strong cation and chelating types, were contacted with whole ore PLS. The results were inconclusive.

2. One test was performed contacting neutralized PLS solution with DEHPA. The results were inconclusive.

3. Aluminum precipitation from PLS was performed by neutralization at Ph of around 3 to 3.5 to form goethites and jarosites. A considerable amount of REE's were co-precipitated in the tests.

13.5 Phase IV Study

The primary objective of this phase of the study was to determine the amenability of heap leaching for extraction of REE's. The program included static leach tests (bucket leach tests) to evaluate the relative leachability with sulfuric acid of various size fractions of the material as well as with various acid strengths. Two open-circuit column tests were run at two different acid strengths to generate heap leaching design data.

The highlights of the leaching test results were as follows:

1. The sulfuric acid strength for the 63 day static bucket tests was 10 g/l. The best extractions occurred with the ½ inch by 1 inch crush size. Yttrium, dysprosium HREE+Y and TREE+Y extractions averaged from 42% to 49%. Yttrium and dysprosium extractions from the ½ inch by 1 inch fraction were 61.1% and 57.5%, respectively.
2. The second series of static bucket tests used a ½ inch crush size and tested various acid strengths from 5 g/l to 100 g/l. A summary of the test results is shown in Table 13-1. Higher acid strengths resulted in higher extractions for all metals in every case. The acid consumption was not linear with the acid strength. Extractions were higher than any recoveries in previous flotation work.

Table 13-1 Summary of Bucket Static Leach Tests

Test No.	Acid Strength g/l	Extraction, %					Acid Consumption
		Y	Dy	U	TREE+Y	HREE+Y	Kg/mt
SL-10	5	24.6	21.4	4.8	24.8	27.3	9.2
SL-6	10	47.4	42.8	13.3	43.3	47.5	13.1
SL-7	30	70.5	64.9	21.2	62.2	68.4	19.4
SL-8	50	77.4	74.8	28.4	67.4	74.1	21.6
SL-9	100	84.0	79.4	30.7	73.4	79.9	29.6

3. Two open-circuit columns were run to generate data for preliminary heap leach design and to compare two different acid strengths (35 g/l vs. 75 g/l). A summary of the data from the columns is shown in Table 13-2. The extractions were higher for the 75 g/l acid strength, being 82.8% and 79.9% for HREE+Y and TREE+Y, respectively. Yttrium and dysprosium extractions were 91.3% and 87.2%, respectively. Acid consumptions were 22.3 and 26.2 kg/mt for the 35 g/l and 75 g/l cases, respectively. Kinetics were relatively fast in each case.

Table 13-2 Summary of Percent Extractions for Selected Elements

Element	Column 1, Days (Low Acid)			Column 2, Days (High Acid)		
	20	40	60 (1.)	20	40	60 (1.)
HREE + Y	63.0	69.6	73.2	78.7	81.3	82.8
TREE +Y	62.5	68.8	72.4	74.5	78.0	79.9
Y	79.0	87.4	89.6	86.0	90.0	91.3
Dy	74.4	81.2	83.3	83.0	86.2	87.2
U	21.6	24.9	26.2	26.4	29.6	31.0
Th	81.4	86.9	89.2	85.5	89.1	90.8
Lu	56.5	62.9	65.0	61.6	65.6	67.0
Ho	73.6	80.2	82.2	82.6	85.5	86.4
Er	69.9	76.4	78.6	79.2	82.2	83.3
Tm	62.7	69.0	71.1	73.7	76.7	77.7
Yb	59.8	65.9	68.0	69.7	73.2	74.4
Tb	76.6	83.1	85.3	82.7	85.9	87.0
Be	2.3	4.3	5.6	4.9	8.0	9.7
Li	10.1	22.0	30.3	26.8	45.4	58.5

13.6 Phase V Study

The objective for this phase of the work was to gather basic information regarding removal of iron, aluminum, uranium and thorium from pregnant leach solution followed by selective removal of REE's. The program included pH adjustments to drop out iron followed by contact with Column 1 media which is designed specifically for uranium and thorium removal. The remaining solution was contacted with Column 2 media which is specific for removal of REE's.

The highlights of the test results are summarized below:

1. The program was preliminary in nature but did indicate that the uranium and thorium could be partially removed with little or no REE removal in the first stage contact. Additional experimentation is ongoing to improve the uranium and thorium removal metrics.

2. In the second stage contact, much of the uranium and thorium not removed in the first stage was recovered. The REE removal is low, but encouraging that it will work.

3. More experiments are required to understand the chemistry of the unique solutions from leaching the Round Top ore. The Tusaar technology will be evaluated in a semi-continuous circuit when performing additional larger column testwork.

13.7 Conceptual Process Flowsheet

Based on the evaluation of several processing options, the TRER management, along with consultants, concluded that the heap leaching option would be the best techno-economic approach to recovering REE's.

The conceptual process flowsheet developed for this study included the following:

1. Heap leaching of P_{100} of ½ inch crushed ore.
2. Tusaar developed process of first separating iron and then uranium and thorium from the pregnant solution followed by selective recovery of combined REE's from the remaining solution.
3. Conventional Chinese designed technology to further separate eight of the individual HREE's as single, one-element, products. A mixed LREE product will also be made as a salable product.

The overall simplified flowsheet is given as Figure 13.1.

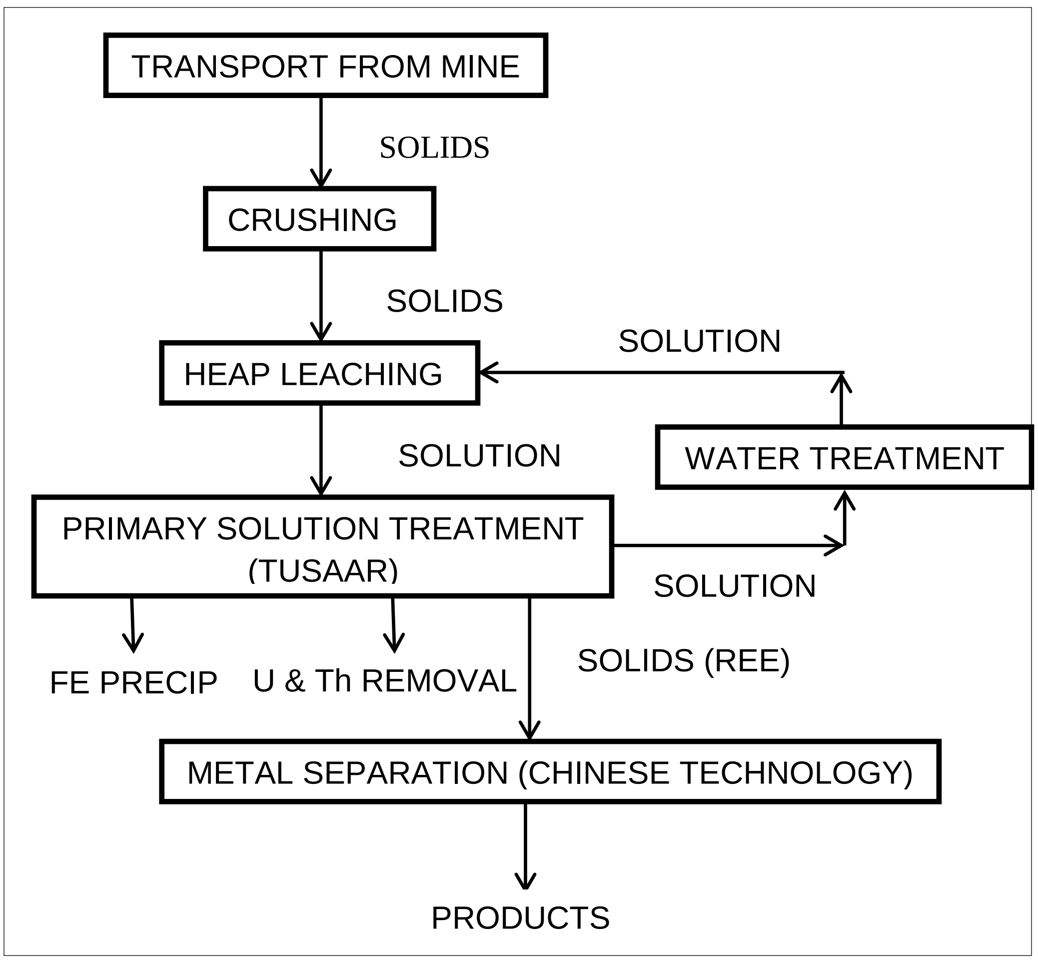


Figure 13-1 Simplified Process Flowsheet

Factors that could potentially affect the economics of the project include the possibility of build-up of metals or compounds in the process solutions. The ones that are being actively addressed include iron and aluminum which tend to have high levels in the PLS. Others that will need to be addressed include uranium and thorium. These will probably require removal or sequestering. The resulting products would either be sold or disposed of by environmentally acceptable methods. The long-term effect of sulfates in the system is another unknown at this time.

14 MINERAL RESOURCE ESTIMATE

The effective date of the mineral resource estimate for the Round Top Project is January 2013 and was completed by Richard Schwering, Associate Gustavson Geologist and M. Claiborne Newton, Gustavson Chief Geologist and qualified person. This mineral resource estimate has been prepared in accordance with NI 43-101 and CIM. Gustavson generated this resource for the Round Top Project.

14.1 Data Used for REE Grade Estimation

Gustavson created a 3-Dimensional (3-D) block model for estimating mineral resources at the Round Top Project. Drill hole data, including collar coordinates, down hole surveys, sample assay intervals, and geology logs, were provided by TRER as Microsoft Excel files. The Round Top Project drill hole database contains lithology, assay, and REE grades as individual elements. Exploration drilling at Round Top has been completed by three companies: Cabot, Cyprus, and TRER. In the 1980s a Cabot-Cyprus Joint Venture began exploration drilling for beryllium mineralization associated with massive fluorite outcrops at the contact of the rhyolite and the underlying limestone. A portion of the RC drill chips (43) were preserved and logged and assayed for REEs by TRER. At the effective date of this report, TRER had completed 86 drill holes with final assays and certificates for 85 drill holes with a total of 3,081 sample intervals. All assays were imported into the model, but only holes that cut rhyolite were used in the resource estimation. This amounted to 69 TRER drill holes with 1,880 samples, plus 33 historical holes with 550 samples, for a total of 102 drill holes with 2,430 samples.

14.2 Estimation Methodology

14.2.1 Geologic Model

Modeled elements within the Round Top project area are zoned by lithology. A geologic model was created from drill log data provided by TRER. The initial data contained 20 different lithologic classifications. These were grouped into 6 lithologies. Using these grouped lithologies, a lithologic model was created using Leapfrog^{TM} Mining Software. Figures 14-1 and 14-2 display the geologic model created in Leapfrog. The lithologic model was then imported into MicroModel^{TM} for resource estimation and is shown in cross-section in Figure 14-3. The final model included the lithologies; Red/Pink Rhyolite, Grey Rhyolite, Brown Rhyolite, Cover, Basal Sedimentary Rocks, and Little Round Top Rhyolite. The unit referred to as Basal Sedimentary Rocks includes Cretaceous marine limestones and black shales and pre-rhyolite Tertiary diorite.

The final lithologic model was then tied back into the drill hole database as modeled lithologies. In most cases, the REEs and other elements modeled in this study are normally distributed throughout the rhyolite body. While there was some evidence of Eu enrichment at the top of the basal sedimentary rocks, the resource was calculated for the Round Top Rhyolites only. Table 14-1 summarizes the categorization of the lithologic model.

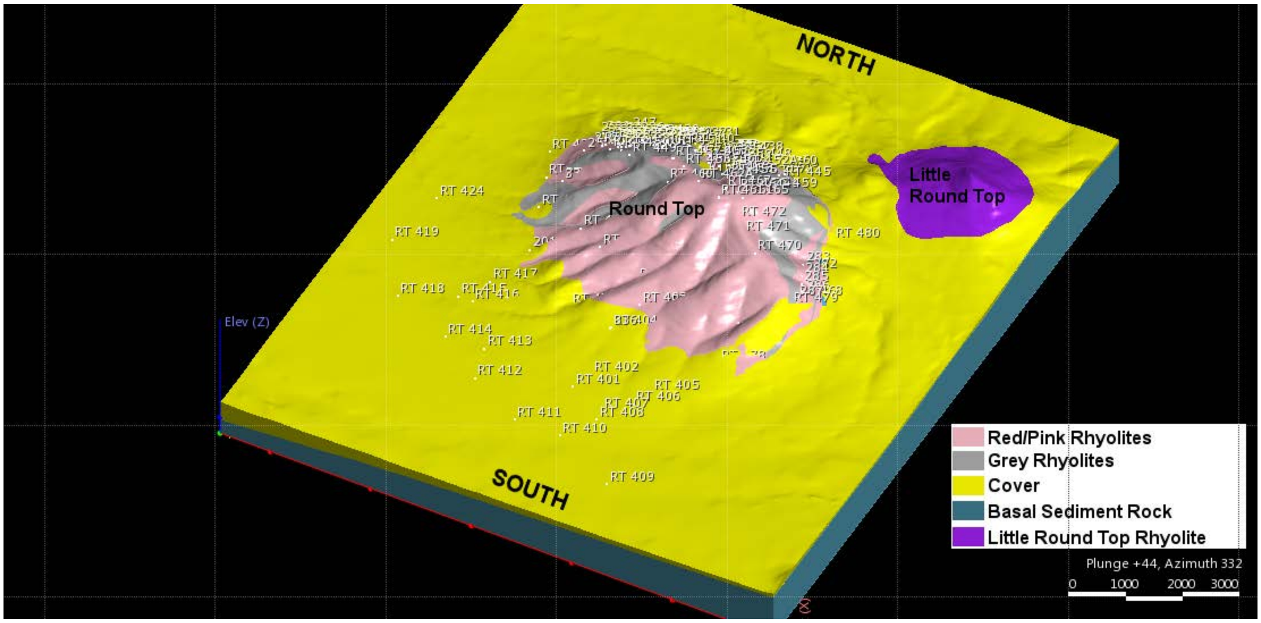


Figure 14-1 Aspect View of 3-D Lithologic Model Created in Leapfrog Including Drill Collar Locations

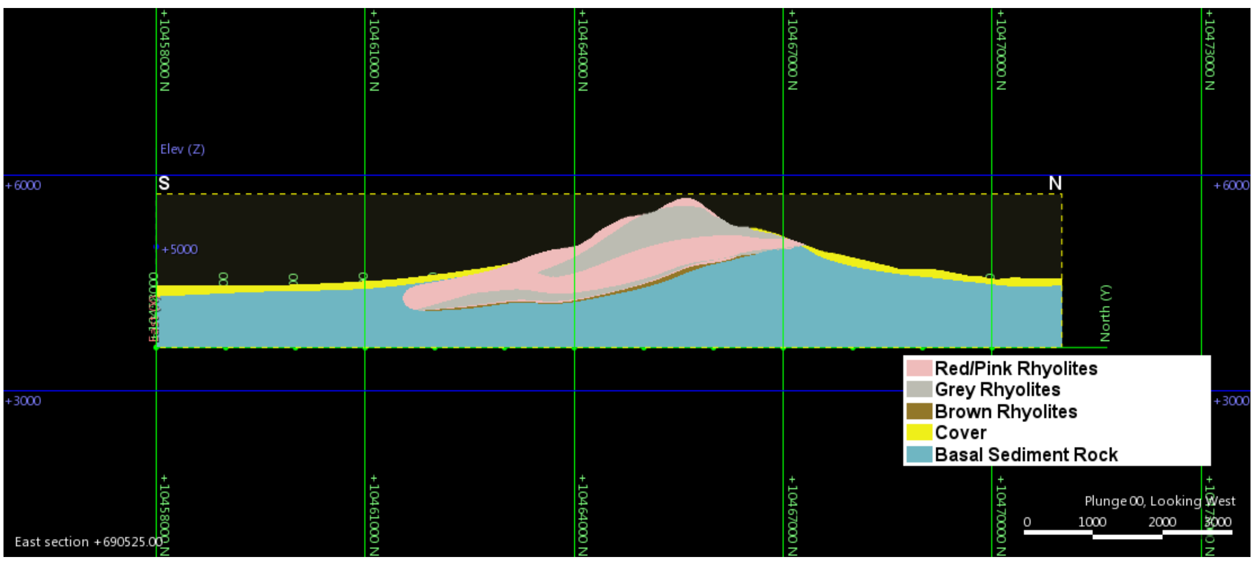


Figure 14-2 North/South Cross Section of Lithologic Model at 690525E with a 50’ Thickness from Leapfrog

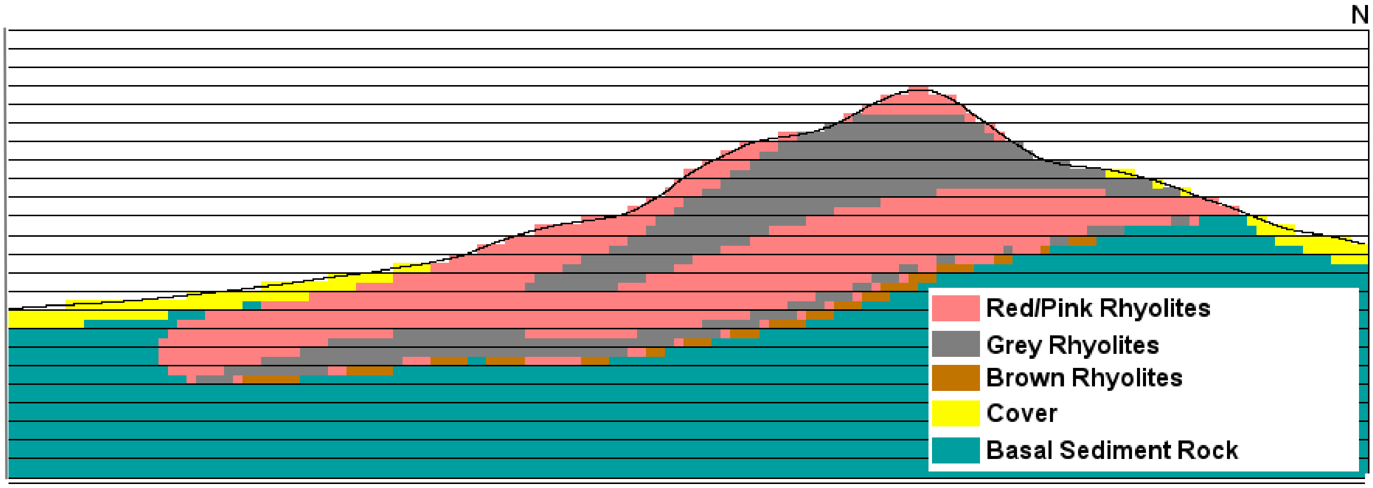


Figure 14-3 North/South Cross Section of Lithologic Model at 690525E After Import to Micro Model

Table 14-1 Geologic Model Summary

Original TRER DH Database		Leafrog Lithology		Micro Model Code	Backmarked Modeled Lithology		Block Model
Name	Instances	Layer Name	Description	Code	Code	Instances	Count
gry rhy	670	GR1, GR2	Grey Rhyolite	3, 5	3, 5	800	37,635
rd rhy	587	RP1, RP2, RP3	Red/Pink Rhyolite	2, 4, 6	2, 4, 6	1,579	88,325
pk rhy	485						
tan rhy	128	BrownRhy	Brown Rhyolite	7	7	51	3,687
brn rhy	2						
Rhy	428	N/A	Rhyolite with no color information split between Grey and Red/Pink Ryolite based on Leapfrog lithologic model		N/A	N/A	N/A
Qg	459	COVER	Cover	1	1	416	80,702
Qal	7						
LS	60	BASALSEDS	Basal Sediments	8	8	182	631,894
gry ls	43						
bk sh	32						
Sh	16						
gry sh	4						
bk slty ss	2						
bk ls	1						
Breccia	15		Ignored	Based on litholigic model	N/A	N/A	N/A
dio	8						
Diorite	4						
gry dio	2						
bk dio	1						
(blanks)	128						
nd	13						
			Little Round Top Rhyolite (from geologic map)	10	N/A	N/A	12,911

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14.2.2 Statistical Data

This resource estimate models 15 rare earth elements including Y, plus 6 other elements, totaling 21 elements. These elements are: Cerium (Ce), Dysprosium (Dy), Erbium (Er), Europium (Eu), Gadolinium (Gd), Hafnium (Hf), Holmium (Ho), Lanthanum (La), Lutetium (Lu), Niobium (Nb), Neodymium (Nd), Praseodymium (Pr), Samarium (Sm), Tin (Sn), Tantalum (Ta), Terbium (Tb), Thorium (Th), Thulium (Tm), Uranium (U), Yttrium (Y), and Ytterbium (Yb). Tungsten (W) was also considered for analysis, however, discrepancies between historical and TRER assay results for W made accurate resource estimation for this element impractical.

Within the rhyolite, an effort was made to model the “brown,” “grey,” and “red/pink” rhyolites separately, as it is believed they exhibit different alteration and metallurgic properties, and the brown rhyolite may be enriched in certain economic elements compared to the rest of the rhyolites.

The present model is considered by Gustavson to yield a reasonable approximation of the mineral resource available within the rhyolite body. However, it is important to note that a mineral resource is not a mineral reserve and does not have demonstrated economic viability.

Histograms and cumulative frequency plots, examples of which can be seen in Figures 14-4 and 14-5, were generated in order to evaluate and describe the distribution of the REEs with regard to rhyolite. Table 14-2 below summarizes the relevant descriptive statistics.

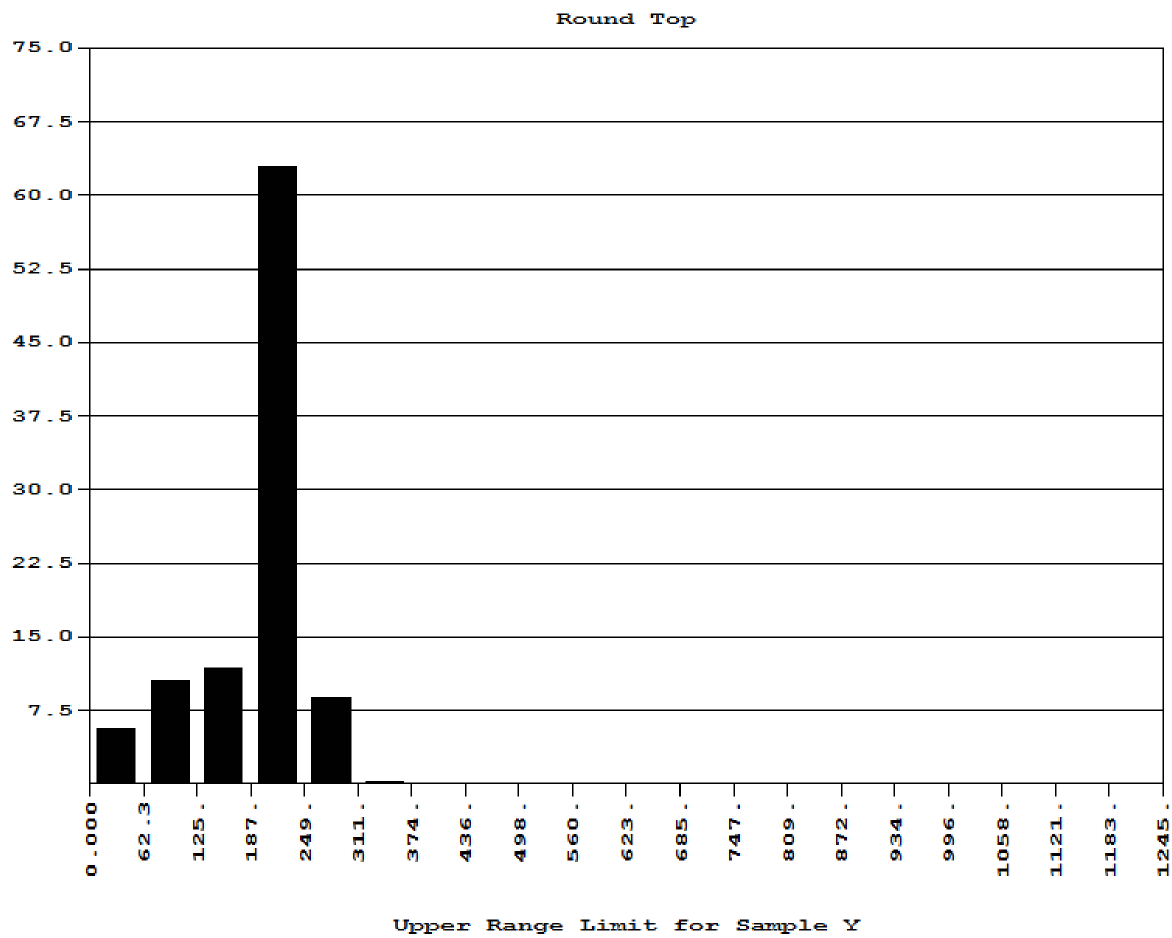

Figure 14-4 Yttrium Histogram Showing Sample Statistics

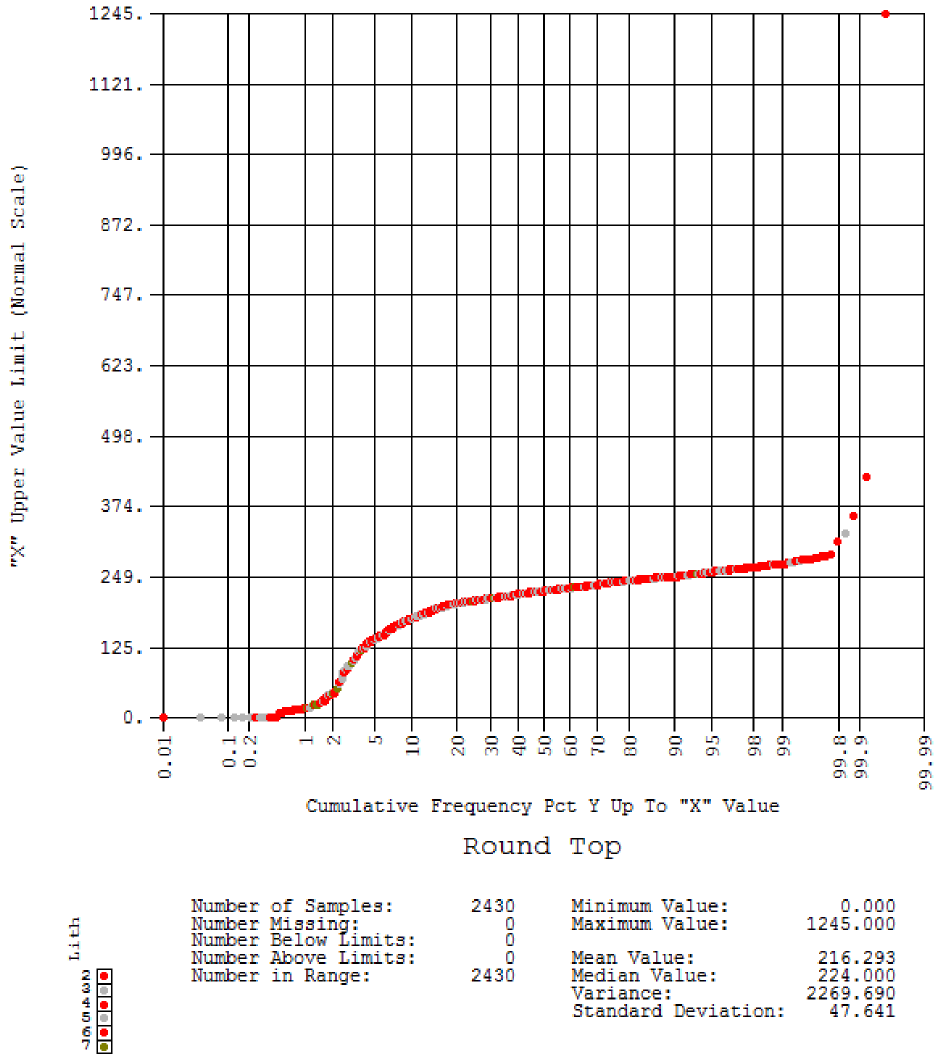

Figure 14-5 Cumulative Frequency Plot of Yttrium Sample Statistics by Rhyolite Types Red=Red/Pink, Grey=Grey Rhyolites, and Brown=Brown Rhyolites.

Table 14-2 Descriptive Statistics of REE's within the Rhyolite

	Count	Minimum (ppm)	Maximum (ppm)	Mean (ppm)	Median (ppm)	Standard Deviation (ppm)	% Difference
Ce	2430	15.7	1100.0	79.8	80.7	23.5	1.2
Dy	2430	1.54	199.00	30.98	32.00	6.48	3.29
Er	2430	1.02	143.50	32.35	33.50	6.08	3.54
Eu	2430	0.04	8.97	0.17	0.12	0.22	28.57
Gd	2430	1.39	134.00	10.26	10.45	3.00	1.84
Hf	2430	1.5	463.0	85.1	87.1	15.2	2.3
Ho	2430	0.31	45.00	7.83	8.13	1.58	3.90
La	2430	7.5	457.0	20.3	20.1	9.3	0.7
Lu	2430	0.17	18.65	8.80	9.08	1.46	3.16
Nb	2430	4.80	1800.00	375.65	384.00	65.69	2.22
Nd	2430	7.300	510.000	28.544	28.600	10.541	0.196
Pr	2430	2.00	138.00	10.37	10.50	2.92	1.27
Sm	2430	1.56	138.50	10.35	10.50	3.01	1.47
Sn	2430	1	381	137	141	24	3
Ta	2430	0.4	143.5	65.9	67.7	10.8	2.7
Tb	2430	0.23	28.10	3.53	3.64	0.78	3.00
Th	2430	3.59	314.00	175.99	181.00	27.84	2.85
Tm	2430	0.15	24.30	7.08	7.30	1.27	3.17
U	2430	2.52	1000.00	49.65	43.00	40.47	13.39
Y	2430	10.1	1245.0	217.4	225.0	45.3	3.5
Yb	2430	1.03	140.00	56.38	58.20	9.54	3.22

The relative closeness of values represented by the mean and the median, the median usually within 5% of the mean, as well as the histogram distributions, suggest that the elements are normally distributed throughout the rhyolite body. Eu and U are the only exceptions. The cumulative frequency plots for Eu and U show enrichment in the brown rhyolite.

14.2.3 Capping

Log transformed cumulative frequency plots based on sample data demonstrated that there were some values well above the trend line. Capping limits were set by determining the point at which the data deviated from the trend line. Capping limits were set before compositing. Table 14-3 summarizes the cap limits.

Table 14-3 Sample Capping

	Cap Limit (ppm)	# Capped		Cap Limit (ppm)	# Capped
Ce	120	8	Pr	15	11
Dy	48	3	Sm	17	7
Er	50	3	Sn	190	4
Eu	0.6	125	Ta	90	4
Gd	17	3	Tb	5.1	5
Hf	110	4	Th	230	3
Ho	11	5	Tm	10	4
La	33	41	U	250	23
Lu	11	8	Y	275	24
Nb	500	4	Yb	80	4
Nd	43	11			

14.2.4 Compositing

A 50 ft composite was used for resource estimation based on a planned bench height of 50 ft. Composite length had little to no influence on the grades of REEs. After compositing, histogram analysis and log transformed cumulative frequency plots were generated, and examples can be seen in Figures 14-6 and 14-7. Compositing resulted in cumulative frequency plots with established trends and histograms with well-defined normal distributions. Table 14-4 summarizes composite statistics.

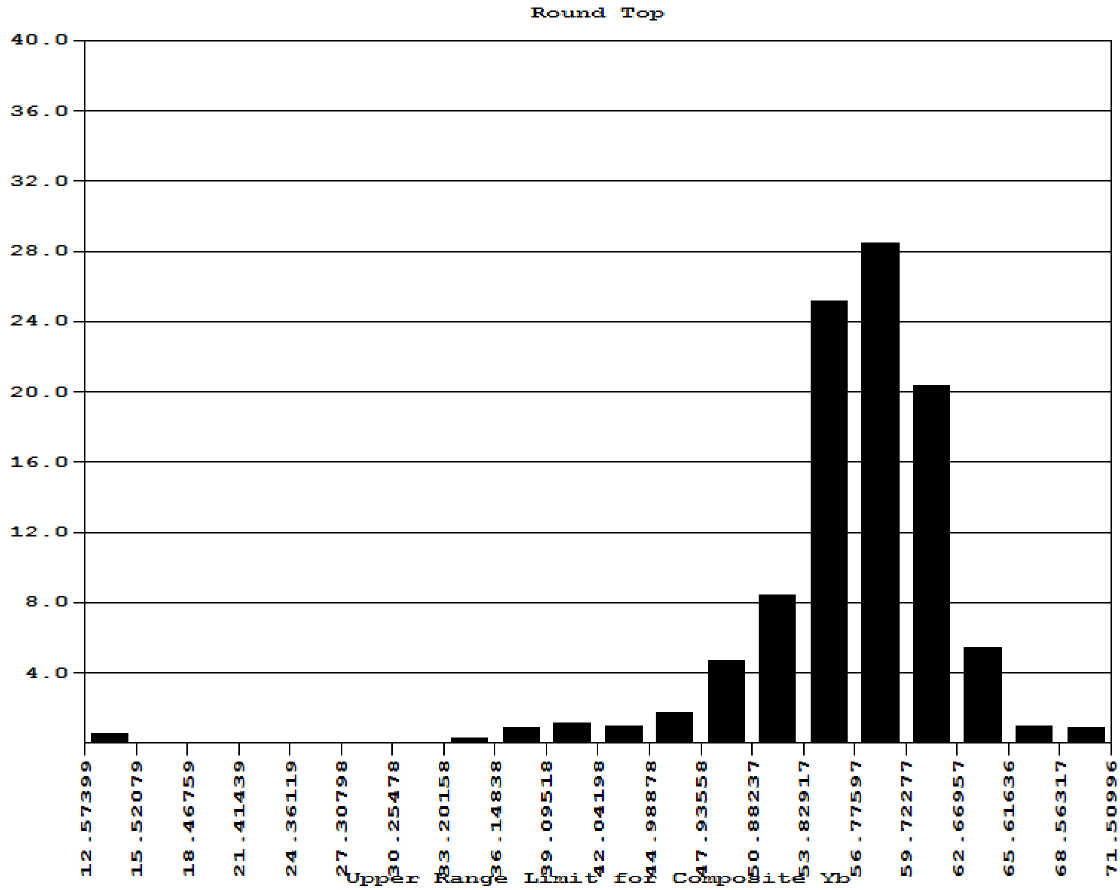

Figure 14-6 Composite Histogram for Yttrium

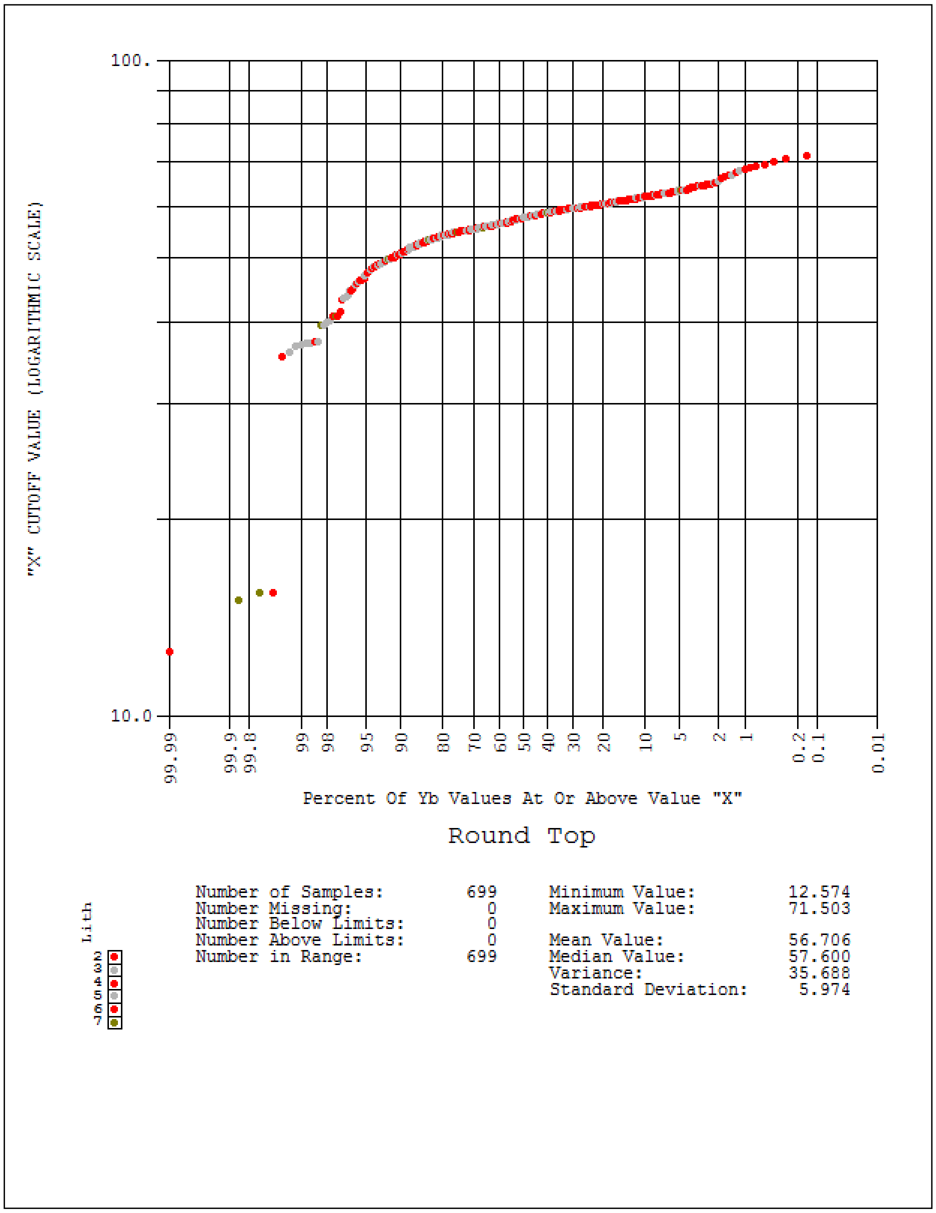

Figure 14-7 Composite Cumulative Frequency Plot for Yttrium by Rhyolite Types Red=Red/Pink Rhyolites, Grey=Grey Rhyolites, and Brown=Brown Rhyolites.

Table 14-4 Composite Descriptive Statistics

	Count	Minimum (ppm)	Maximum (ppm)	Mean (ppm)	Median (ppm)	Variance (ppm)	Standard Deviation (ppm)
Ce	699	37.0	98.8	78.3	79.2	66.7	8.2
Dy	699	8.79	42.91	30.79	31.49	16.48	4.06
Er	699	8.35	44.74	32.45	33.02	15.50	3.94
Eu	699	0.06	0.60	0.14	0.12	0.00	0.06
Gd	699	4.27	15.28	10.12	10.27	1.72	1.31
Hf	699	20.5	97.8	86.3	87.2	54.7	7.4
Ho	699	2.04	9.88	7.80	8.02	1.00	1.00
La	699	10.5	33.0	19.9	20.0	3.1	1.8
Lu	699	1.95	10.80	8.85	9.01	0.83	0.91
Nb	699	83.31	447.88	381.49	384.90	1193.77	34.55
Nd	699	13.350	38.216	28.118	28.360	7.846	2.801
Pr	699	4.76	12.73	10.27	10.38	0.90	0.95
Sm	699	4.42	14.35	10.19	10.35	1.30	1.14
Sn	699	29	162	138	141	203	14
Ta	699	14.5	80.0	66.7	67.7	36.9	6.1
Tb	699	1.08	4.32	3.50	3.59	0.19	0.44
Th	699	40.16	213.73	178.29	180.59	283.84	16.85
Tm	699	1.57	8.53	7.07	7.21	0.62	0.79
U	699	10.09	145.17	45.04	42.48	202.76	14.24
Y	699	57.2	272.5	217.7	222.3	818.7	28.6
Yb	699	12.57	71.50	56.71	57.60	35.69	5.97

14.2.5 Variography

Geostatistical analysis, the method of investigating the spatial relationship of data, was used in order to set the foundation for grade model interpolation. The primary tool used for geostatistical calculation is the variogram, a graphical representation of the difference between any two samples separated by a given distance in a given direction.

General relative variograms were calculated for each of the modeled elements. Variography was fit with a spherical model. Given the normal distribution of the data, omnidirectional variograms were used to calculate the ranges and sills of the variogram. Down hole variograms were used to determine the nugget. An example of an omnidirectional variogram can be seen in Figure 14-8. Drill hole spacing is more clustered in the north and dispersed to the south. As a result, all omnidirectional variograms required two ranges and sills to accurately describe the spatial relationship of the data. The first range, $Range_1$, represents the more clustered drilling. These values range between 50 ft to 250 ft with an average 114 ft. The second range, $Range_2$, was determined to be 400ft for all elements, and represents the more dispersed drilling data to the south. After the variograms were calculated, the variograms were normalized to reduce the variance in the data to 1, and sets the nugget and sills to a ratio of 1 for all modeled elements.

The ranges are unaffected by normalization. Table 14-5 displays the original variogram and the normalized equivalent.

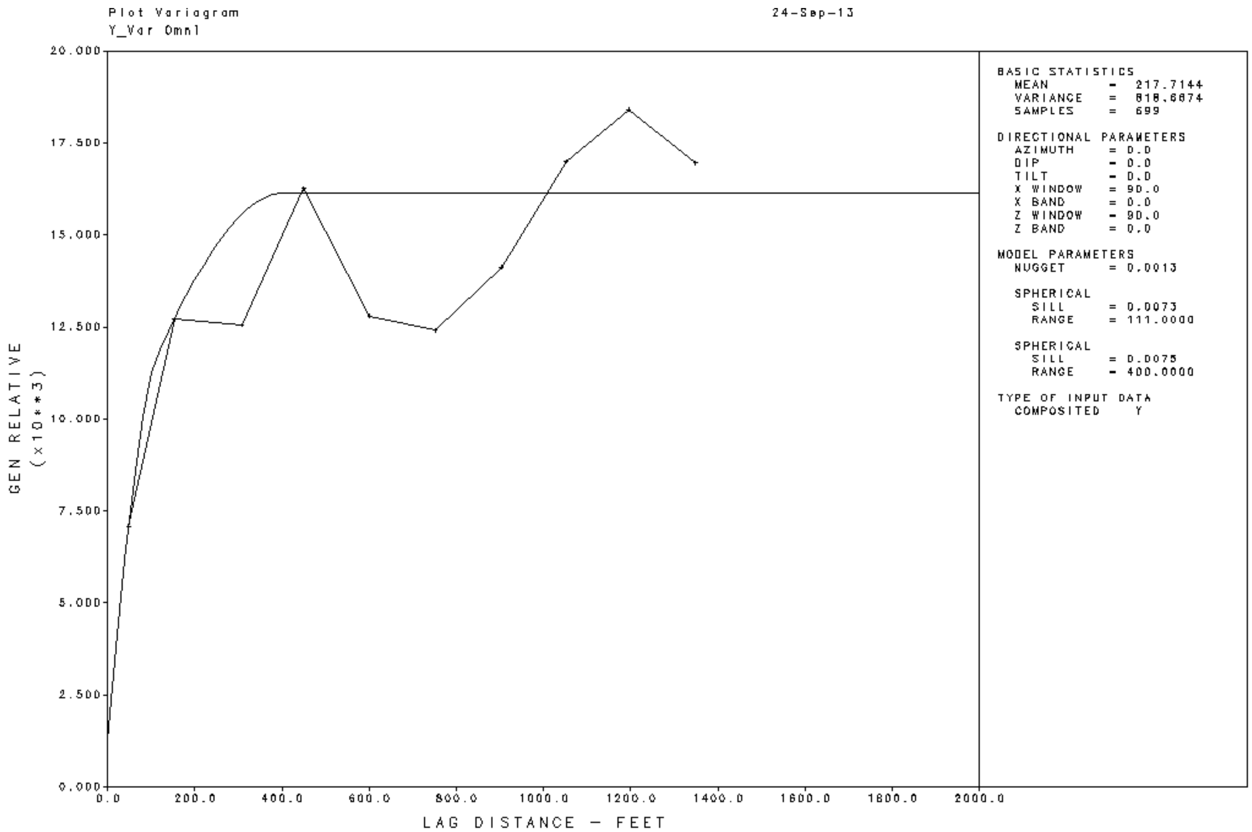

Figure 14-8 Spherical Variogram of Yttrium with Model Parameters

Table 14-5 Normalized Variograms

	Ce	Normalized	Dy	Normalized	Er	Normalized
Nugget	0.0006	0.0800	0.0013	0.0760	0.0001	0.0068
$Sill_1$	0.0035	0.4667	0.0081	0.4737	0.0070	0.4795
$Sill_2$	0.0034	0.4533	0.0077	0.4503	0.0075	0.5137
Total	0.0075	1.0000	0.0171	1.0000	0.0146	1.0000
$Range_1$	62.9065	62.9065	151.9308	151.9308	95.841	95.841
$Range_2$	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000

	Eu	Normalized	Gd	Normalized	Hf	Normalized
Nugget	0.0235	0.2164	0.0015	0.0838	0.0010	0.1818
$Sill_1$	0.0323	0.2974	0.0124	0.6927	0.0026	0.4727
$Sill_2$	0.0528	0.4862	0.0040	0.2235	0.0019	0.3455
Total	0.1086	1.0000	0.0179	1.0000	0.0055	1.0000
$Range_1$	64.9324	64.9324	190.0000	190.0000	70.1487	70.1487
$Range_2$	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000

	Ho	Normalized	La	Normalized	Lu	Normalized
Nugget	0.0010	0.0625	0.0010	0.1316	0.0012	0.1463
$Sill_1$	0.0077	0.4813	0.0047	0.6184	0.0050	0.6098
$Sill_2$	0.0073	0.4563	0.0019	0.2500	0.0020	0.2439
Total	0.0160	1.0000	0.0076	1.0000	0.0082	1.0000
$Range_1$	112.4076	112.4076	69.3316	69.3316	107.6307	107.6307
$Range_2$	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000

	Nb	Normalized	Nd	Normalized	Pr	Normalized
Nugget	0.0011	0.1774	0.0004	0.0417	0.0080	0.5128
$Sill_1$	0.0021	0.3387	0.0037	0.3854	0.0046	0.2949
$Sill_2$	0.0030	0.4839	0.0055	0.5729	0.0030	0.1923
Total	0.0062	1.0000	0.0096	1.0000	0.0156	1.0000
$Range_1$	69.0000	69.0000	60.0000	60.0000	70.0000	70.0000
$Range_2$	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000

	Sm	Normalized	Sn	Normalized	Ta	Normalized
Nugget	0.0031	0.1615	0.0013	0.1429	0.0012	0.2000
$Sill_1$	0.0115	0.5990	0.0032	0.3516	0.0029	0.4833
$Sill_2$	0.0046	0.2396	0.0046	0.5055	0.0019	0.3167
Total	0.0192	1.0000	0.0091	1.0000	0.0060	1.0000
$Range_1$	217.3569	217.3569	152.3153	152.3153	85.0000	85.0000
$Range_2$	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000

	Tb	Normalized	Th	Normalized	Tm	Normalized
Nugget	0.0013	0.0850	0.0013	0.1646	0.0013	0.1226
$Sill_1$	0.0121	0.7908	0.0040	0.5063	0.0067	0.6321
$Sill_2$	0.0019	0.1242	0.0026	0.3291	0.0026	0.2453
Total	0.0153	1.0000	0.0079	1.0000	0.0106	1.0000
$Range_1$	165.0000	165.0000	88.0000	88.0000	125.0000	125.0000
$Range_2$	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000

	U	Normalized	Y	Normalized	Yb	Normalized
Nugget	0.0117	0.1334	0.0013	0.0807	0.0008	0.0870
$Sill_1$	0.0695	0.7925	0.0073	0.4534	0.0044	0.4783
$Sill_2$	0.0065	0.0741	0.0075	0.4658	0.0040	0.4348
Total	0.0877	1.0000	0.0161	1.0000	0.0092	1.0000
$Range_1$	250.0000	250.0000	111.0000	111.0000	81.4558	81.4558
$Range_2$	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000

14.3 Mineral Grade Estimation

14.3.1 Estimation Method

Ordinary kriging is the estimation method used in this resource model. Kriging is a weighted average estimator which uses variograms to take geologic controls into account. An inverse distance squared estimation method could have been used, since the boundary of the rhyolite is the only geologic control taken into account. However, kriging handles the declustering of data more effectively than the inverse distance squared method. Declustering was necessary because of the higher density of drill holes in the northern part of the project area compared to the southern part.

14.3.2 Search Parameters

Grade estimations were done for the 21 modeled elements. Due to the normal distribution of the data, an isotropic model was used with a search range of 1,000 ft. Before a block could be given an estimated value, 3 points had to be found with only 2 points from the same drill hole. This ensures that grade estimations are not coming from a single hole. Eu exhibited statistics which differed from the other elements. As a result, slightly different modeling parameters were used for this element. Specifically the search range was left at 1,000 ft, and 5 points had to be found with only 2 points coming from the same drill hole before a block could be estimated. Finally, the normalized variogram was entered for each element. An example of a histogram and cumulative frequency plot can be seen in Figures 14-9 and 14-10.

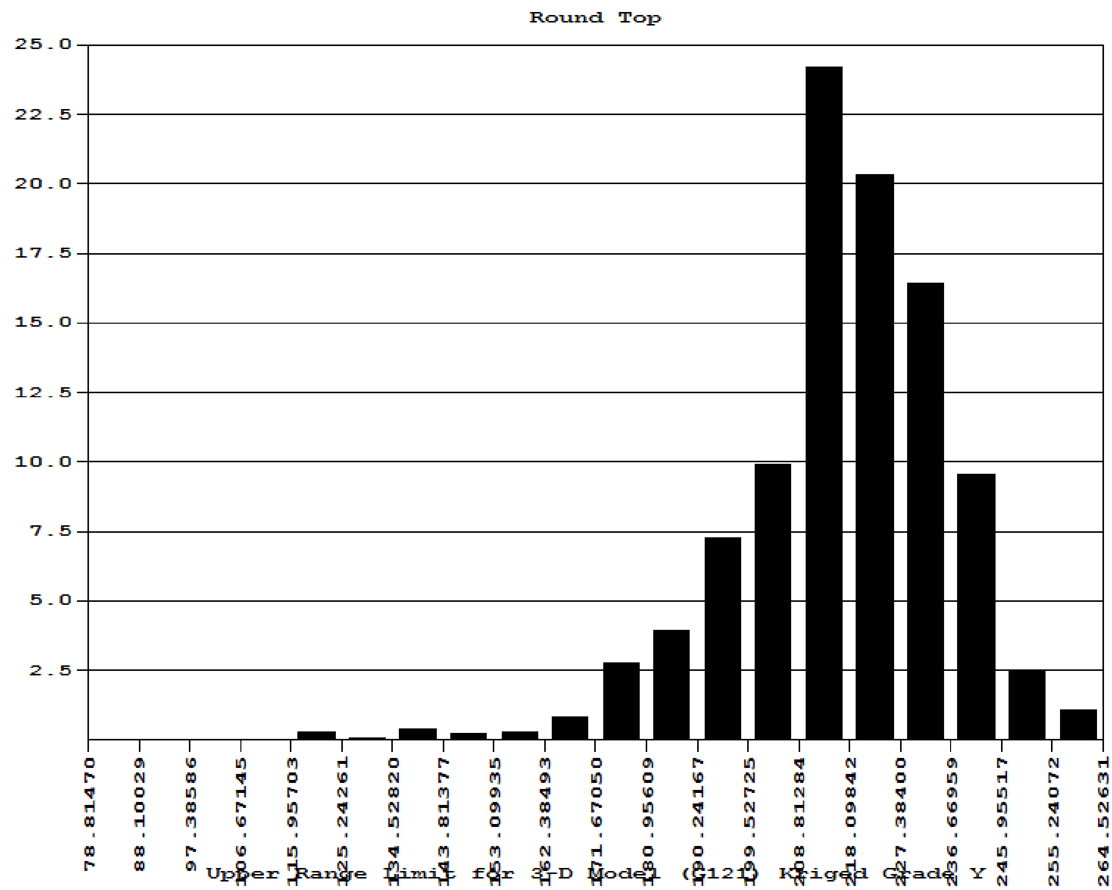

Figure 14-9 Yittrium Histogram Showing Block Model Statistics

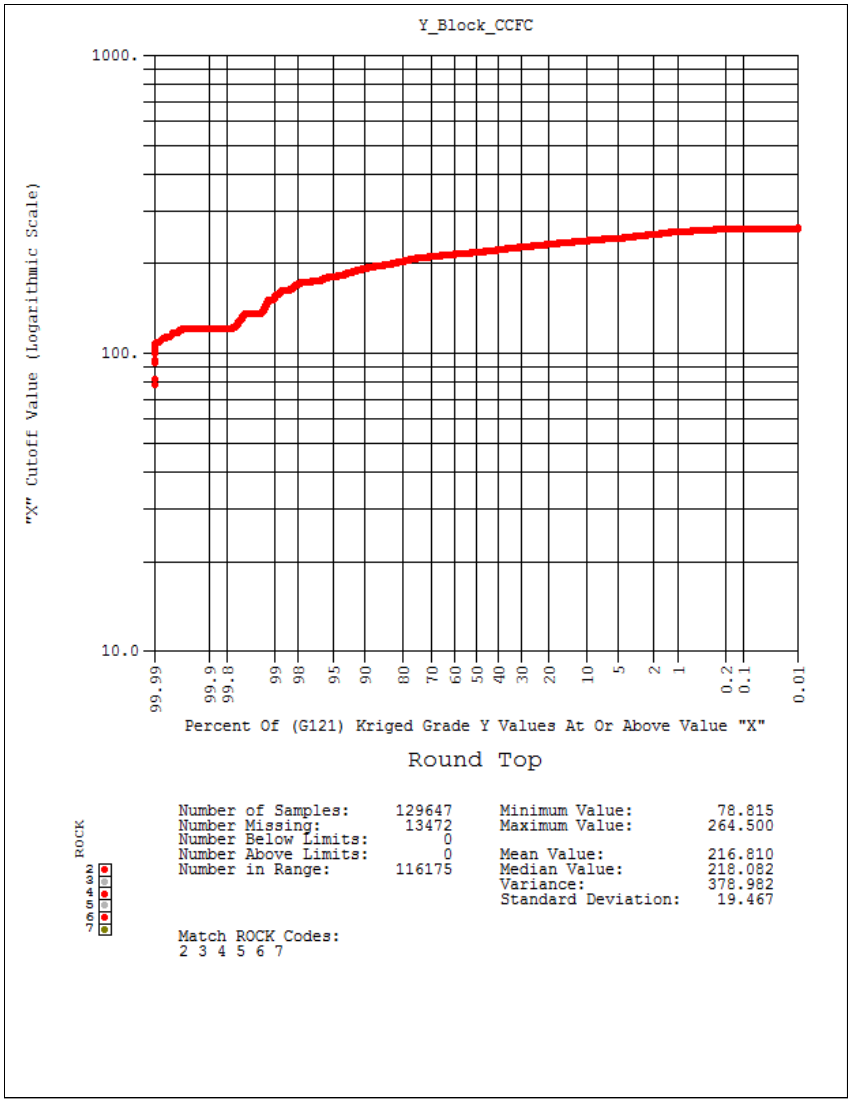

Figure 14-10 Block Model Cumulative Frequency Plot for Yittrium by Rhyolite Types Red=Red/Pink Rhyolites, Grey=Grey Rhyolites, and Brown=Brown Rhyolites. Due to high number of blocks, only red can be seen.

14.3.3 Model Validation

The model was checked primarily by statistical methods as well as a visual inspection of the model. The visual checks were completed on bench levels. Visual inspections confirmed grade estimates were only being done inside the rhyolite boundaries, and there were no model blowouts affecting the resource estimate. The statistical checks are valid for the entire model.

The mean, median, and maximum from the composites were compared with the block model. Ideally, the mean, median and maximum in the block model will be slightly lower than the composited data. While this held true for the majority of the elements modeled, there were six instances where the mean and median rose in the block model and one instance where only the mean rose. There were no instances where the maximum rose. Generally these increases were all less than or equal to 1.5%, consistent with the normalized distribution of the data. Eu shows a 16.5% increase in the median. The reasons for this increase could be linked to Eu's enrichment in brown rhyolite. U also exhibits a 3% increase in the median. This could also be a result of the U enrichment in the brown rhyolite. Because the impact of these elements on the overall model is low, the model is still considered by Gustavson to be accurate. Table 14-6 displays this statistical check.

Table 14-6 Model Validation by Statistics

	Composite and Capped			Block Model			% Difference		
	Mean (ppm)	Median (ppm)	Maximum (ppm)	Mean (ppm)	Median (ppm)	Maximum (ppm)	Mean	Median	Maximum
Ce	78.3	79.2	98.9	79.5	80.4	92.6	1.53	1.52	-6.37
Dy	30.79	31.49	42.91	30.75	31.05	40.30	-0.13	-1.40	-6.08
Er	32.45	33.02	44.74	32.23	32.55	42.42	-0.68	-1.42	-5.19
Eu	0.14	0.12	0.60	0.15	0.14	0.40	7.14	16.67	-33.33
Gd	10.12	10.27	15.28	10.22	10.31	14.52	0.99	0.39	-4.97
Hf	86.3	87.2	97.8	85.6	86.5	95.0	-0.81	-0.80	-2.90
Ho	7.80	8.02	9.88	7.80	7.88	9.37	0.00	-1.72	-5.16
La	19.9	20.0	33.0	20.2	20.2	28.1	1.30	0.77	-14.85
Lu	8.83	9.01	10.80	8.79	8.87	10.14	-0.45	-1.58	-6.11
Nb	381.49	384.90	447.88	376.78	379.78	431.09	-1.23	-1.33	-3.75
Nd	28.118	28.360	38.216	28.415	28.570	36.218	1.06	0.74	-5.23
Pr	10.27	10.38	12.73	10.36	10.41	11.77	0.88	0.29	-7.54
Sm	10.19	10.35	14.35	10.29	10.34	13.50	0.98	-0.10	-5.92
Sn	138	141	162	138	140	158	0.00	-0.71	-2.47
Ta	66.7	67.7	80.0	66.5	67.1	77.2	-0.30	-0.89	-3.50
Tb	3.50	3.59	4.32	3.52	3.55	4.20	0.57	-1.11	-2.78
Th	178.29	180.59	213.73	176.91	177.99	202.04	-0.77	-1.44	-5.47
Tm	7.07	7.21	8.53	7.06	7.16	8.31	-0.14	-0.69	-2.58
U	45.04	42.48	145.17	45.37	44.05	123.70	0.73	3.70	-14.79
Y	217.7	222.3	272.5	216.8	218.1	264.5	-0.41	-1.89	-2.94
Yb	56.71	57.60	71.50	56.49	57.04	68.01	-0.39	-0.97	-4.88

14.4 Mineral Resource Classification

The mineral resource has been classified for the Round Top project as measured, indicated, and inferred. The classification of mineral resources is based on the distance of a block from a rhyolite sample point.. Measured resources occur within 200 ft. or half the typical variogram model distance. Indicated resources occur between a distance of 200 ft. and 400ft. the full variogram model distance. Inferred mineral resources occur at a distance greater than 400ft, but less than 1,000 ft, for the search radius for all modeled elements.

14.5 Mineral Resource Tabulation

The mineral resource estimate contains all data as of January 2013. The resource is reported on a yttrium cutoff equivalent. The mineral resource estimate is reported with a yttrium equivalent cutoff of 428 ppm, and is tabulated for all rhyolite, including unaltered and altered varieties. The equations below were used to calculate the Yttrium equivalent cutoff grade.

$$Yeq = Y(1.269) + Dy(1.148)\left(\frac{\$900.00}{\$50.00}\right) + Nd(1.166)\left(\frac{\$100.00}{\$50.00}\right) + Tb(1.151)\left(\frac{\$1{,}100.00}{\$50.00}\right) + Eu(*\,1.158)\left(\frac{\$1{,}100.00}{\$50.00}\right)$$

$$\text{Cutoff (Y)} = \frac{\text{(Process Cost + G\&A + Mining Cost)}}{\text{Price(Y)*Recovery}}$$

$$\text{Cutoff (Y)} = \frac{(12.65 + 0.85 + 1.94)}{\$50.00*72\%} = 428\text{ppm*}$$

*** This formula is used to simplify the calculation of the cutoff grade, it is not used in any of the economic calculations.**

Table 14-7 below shows the measured, indicated, and inferred mineral resources estimated within the Round Top Project, with an effective date of January 2013. The mineral resources are reported using a 428 ppm Yttrium equivalent cutoff. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted to Mineral Reserves.

Table 14-7 Estimated Resource of All Rhyolites with a Y (eq) 428 gpt Cutoff

All Rhyolites with 428 gpt Cutoff

	Element Symbol	Conversion Factor (wt %)		Measured		Indicated		Measured + Indicated		Inferred	
			Short Tons	(x 1000)	230,984	(x 1000)	297,960	(x 1000)	528,944	(x 1000)	376,955
			Kilotonnes		209,502		270,250		479,752		341,898
			Element Oxide	gpt (elem.)	oxide (kg)*	gpt (elem.)	oxide (kg)	gpt (elem.)	oxide (kg)	gpt (elem.)	oxide (kg)
Lanthanum	La	1.1728	La_2O_3	19.9	4,889,520	20.1	6,370,672	20.0	11,260,192	20.3	8,139,857
Cerium	Ce	1.1713	Ce_2O_3	78.7	19,312,214	79.8	25,260,171	79.3	44,572,385	79.9	31,997,181
Praseodymium	Pr	1.1703	Pr_2O_3	10.32	2,530,265	10.4	3,289,242	10.37	5,819,507	10.43	4,173,288
Neodymium	Nd	1.1664	Nd_2O_3	28.203	6,891,789	28.482	8,978,075	28.360	15,869,864	28.613	11,410,579
Samarium	Sm	1.1596	Sm_2O_3	10.23	2,485,267	10.32	3,234,098	10.28	5,719,365	10.35	4,103,414
				Total LREO	**36,109,055**	**Total LREO**	**47,132,258**	**Total LREO**	**83,241,313**	**Total LREO**	**59,824,319**
Europium	Eu	1.1579	Eu_2O_3	0.13	31,536	0.14	43,809	0.14	75,345	0.14	55,424
Gadolinium	Gd	1.1526	Gd_2O_3	10.19	2,460,605	10.27	3,199,001	10.24	5,659,606	10.27	4,047,118
Terbium	Tb	1.151	Tb_2O_3	3.52	848,804	3.54	1,101,143	3.53	1,949,947	3.55	1,397,013
Dysprosium	Dy	1.1477	Dy_2O_3	30.93	7,436,995	30.96	9,602,727	30.95	17,039,722	30.83	12,097,586
Holmium	Ho	1.1455	Ho_2O_3	7.84	1,881,483	7.87	2,436,324	7.86	4,317,807	7.82	3,062,659
Erbium	Er	1.1435	Er_2O_3	32.63	7,817,042	32.55	10,058,945	32.58	17,875,987	32.28	12,620,207
Thulium	Tm	1.1421	Tm_2O_3	7.13	1,706,015	7.14	2,203,777	7.14	3,909,792	7.09	2,768,517
Ytterbium	Yb	1.1387	Yb_2O_3	56.99	13,595,562	56.91	17,513,105	56.94	31,108,667	56.52	22,004,336
Lutetium	Lu	1.1371	Lu_2O_3	8.89	2,117,823	8.89	2,731,906	8.89	4,849,729	8.79	3,417,310
Yttrium	Y	1.2699	Y_2O_3	219.2	58,317,548	219.5	75,330,231	219.4	133,647,779	217.3	94,346,555
				Total HREO	**96,213,413**	**Total HREO**	**124,220,968**	**Total HREO**	**220,434,381**	**Total HREO**	**155,816,725**
				Total REO	**132,322,468**	**Total REO**	**171,353,226**	**Total REO**	**303,675,694**	**Total REO**	**215,641,044**
Niobium	Nb	1.4305	Nb_2O_5	383.29	114,869,448	381.12	147,338,029	382.07	262,207,477	376.44	184,111,291
Hafnium	Hf	1.1793	HfO_2	86.7	21,420,647	86.3	27,504,284	86.5	48,924,931	85.6	34,513,965
Tantalum	Ta	1.2211	Ta_2O_5	67.3	17,216,921	67.1	22,143,130	67.2	39,360,051	66.4	27,721,460
Tin	Sn	1.2696	SnO_2	138	36,705,842	139	47,692,157	139	84,397,999	138.4	60,075,833
Uranium	U	1.1792	U_3O_8	45.43	11,223,270	45.03	14,350,091	45.20	25,573,361	45.15	18,202,960
Thorium	Th	1.1379	ThO_2	179.13	42,703,317	178.29	54,827,234	178.66	97,530,551	176.13	68,522,662

* To calculate oxide kilograms: convert gpt to wt%, multiply wt% element by conversion factor to get wt% oxide, divide that by 100 and multiply by kilotonnes times 1,000,000.

14.6 Potential Risks in Developing the Mineral Resource

At the date of this PEA, there are some risks that could materially affect the potential development of the Mineral Resources. These are two classes of risk, both currently considered minimal.

Processed Material Disposal

The enriched material and adjacent rock contain trace values of radioactive elements. It is not yet known whether the resulting material from processed material will be classified as treated rock or as a contaminated mineral material. Although there seems to be no doubt that the project can be permitted, the classification of the processed material could change the costs for disposing of or treating this material. These costs could have an adverse impact on the project economics including, but not limited to, the results of the PEA described herein.

15 MINERAL RESERVE ESTIMATE

There are no mineral reserves on the Round Top Project at this time.

16 MINING METHODS

This PEA, including the Round Top mine plan within this PEA, includes inferred mineral resource. Inferred mineral resources are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. No mineral resources in this PEA have been converted to reserves. Mineral resources that are not mineral reserves have no demonstrated economic viability. There is no certainty that the results of this PEA will be realized.

The Round Top mine plan is based on using loaders and trucks to transport material to an in pit crusher and then will be conveyed to the leach pad. An initial road will be pioneered up the mountain, with two phases developed to increase available working faces. The nature of the mineralization within the rhyolite laccolith creates a low stripping project with very simple bulk mining parameters.

The rhyolite will be mined in two 25 foot lifts on 50 ft. benches. This gives a good match of medium sized equipment (70 ton trucks and wheel loaders with an 11 yd. bucket) with an assumed daily production rate of 20,000 metric tons or 22,000 short tons. The material will be trucked to the in pit crusher and transported via overland conveyor to the leach pad located approximately 2 miles away near the processing facility. This method of using trucks to haul the material a short distance to be crushed and conveyed is the most economical method at this point due to the long distance it is from the pit to the leach pads.

The minimal waste material is mostly unconsolidated colluvium which will be used as construction to line the leach pad.

For purposes of the PEA, it has been assumed that mining and processing operations will operate 24-hours per day, 7-days per week.

TRER currently plans to own, operate, and maintain all equipment. The general site layout, including pits, waste dumps, infrastructure, ponds, and heap leach pads, is shown on Figure 16-1.

Detailed geotechnical and hydrological studies have not been performed yet on the project and will be done during the feasibility stage of the project.

16.1 Pit Design

The initial 20-year pit was designed based on the configuration of the rhyolite laccolith. The REE grades are nearly equal in all parts of the deposit with some small hot spots for yttrium. Based on the resource model, the grades of material fluctuate minimally throughout the mine plan.

The initial 20 year pit was designed to keep all the mining to the northwest portion of Round Top. It was decided to mine this area first due to the highest drilling density in this area and in order to minimize the visual impact of the mining from the Interstate. Additionally, all the crushing and leaching facilities will be located north of Round top so this will minimize haul distances at the beginning.

Pit slopes have been designed at 45° inter-ramp wall angle. Fracturing within the rhyolite is not yet completely understood and this may affect pit slopes, at least locally. Haul roads are designed at a width of 100 ft., which provides a safe ratio of running surface width to truck width (19 ft) of approximately 5:1. The maximum grade of the haul roads is 10%.

Due to the consistency of REE grades throughout the rhyolite, it is the qualified person's opinion that traditional economic analyses of the pit limit are not meaningful as every block in the model has essentially the same value. The overburden removal required for rhyolite production is minimal. The initial mine plan was developed to remove 20 years of rhyolite from the northwest portion of the hill

The preliminary pit design is shown in Figure 16-2. A more detailed pit design will be done in future studies.

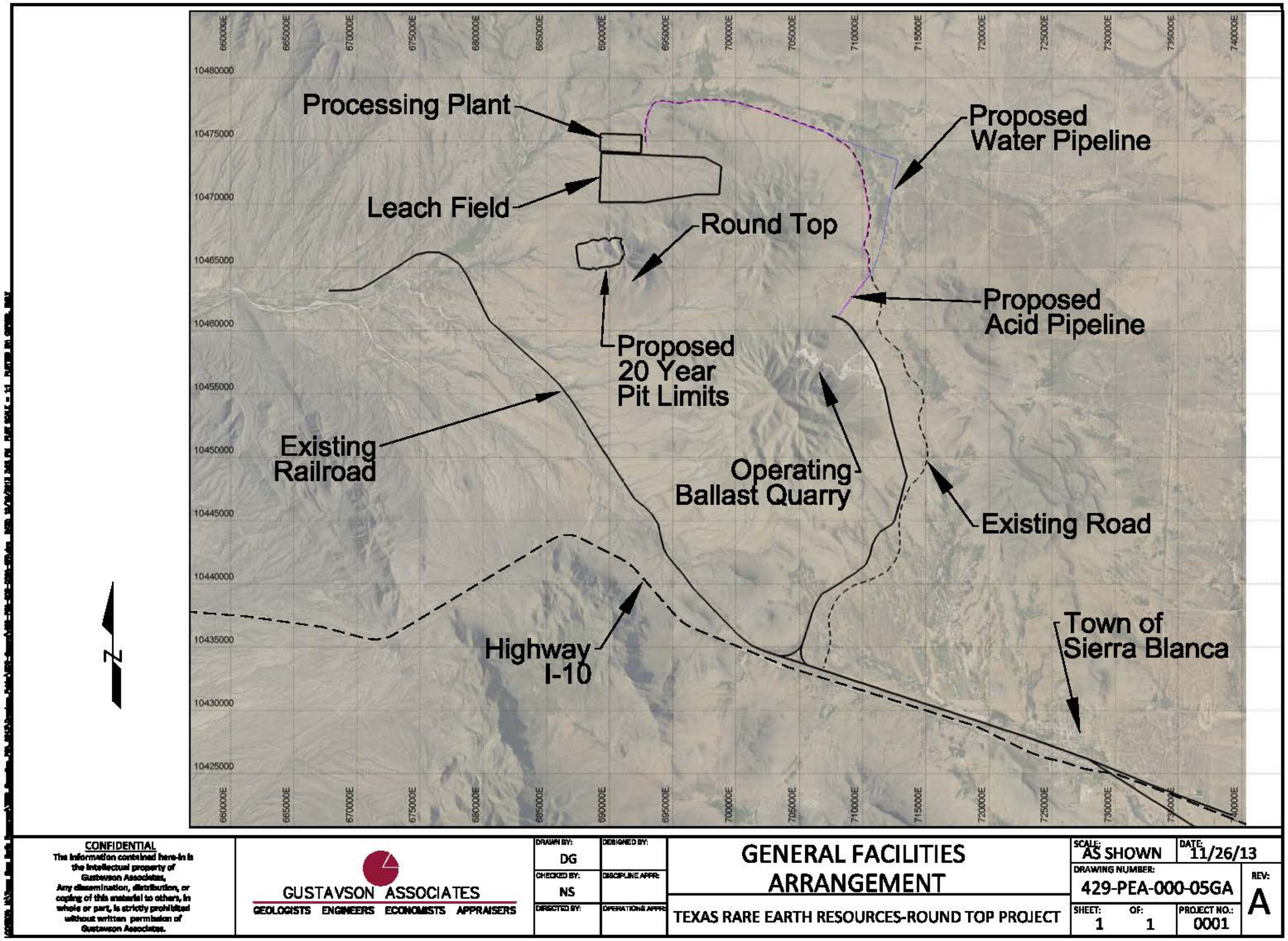

Figure 16-1 General Arrangement

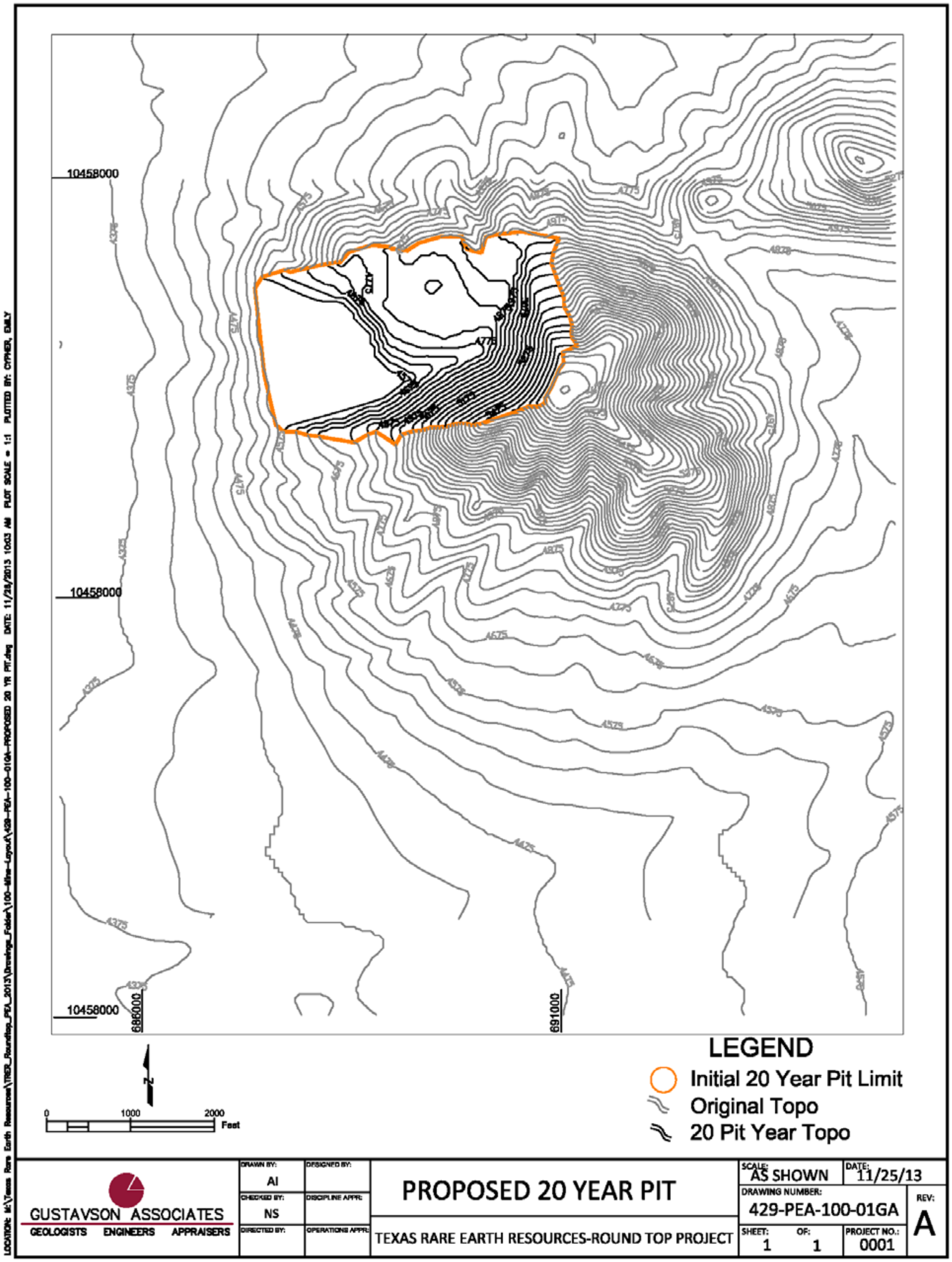

Figure 16-2 Preliminary Pit Design

Table 16-1 below shows the material that the mine plan in the PEA assumes will be mined. .

Table 16-1 Summary of Material included in the Mine Plan*

Round Top – Material included in the Mine Plan Summary										
	Classification		Measured		Indicated		Measured & Indicated		Inferred	
Conversion Factor	Metric ton (x1000)		75,225		46,349		121,574		26,290	
	Symbol	Oxide	Grade REE (ppm)	REO Content (metric tons)	Grade REE (ppm)	REO Content (metric tons)	Grade REE (ppm)	REO Content (metric tons)	Grade REE (ppm)	REO Content (metric tons)
1.1728	La	La_2O_3	19.77	1,744	19.79	1,076	19.78	2,820	20.10	620
1.1713	Ce	Ce_2O_3	77.21	6,803	77.84	4,226	77.45	11,029	79.59	2,451
1.1703	Pr	Pr_2O_3	10.27	904	10.28	558	10.27	1,462	10.37	319
1.1664	Nd	Nd_2O_3	28.13	2,468	28.34	1,532	28.21	4,000	28.86	885
1.1596	Sm	Sm_2O_3	10.20	890	10.26	551	10.22	1,441	10.58	323
1.1579	Eu	Eu_2O_3	0.13	11	0.13	7	0.13	18	0.13	4
1.1526	Gd	Gd_2O_3	10.05	871	10.11	540	10.07	1,411	10.42	316
1.151	Tb	Tb_2O_3	3.47	301	3.50	187	3.48	487	3.62	109
1.1477	Dy	Dy_2O_3	31.06	2,682	31.01	1,650	31.04	4,332	31.58	953
1.1455	Ho	Ho_2O_3	7.88	679	7.91	420	7.89	1,099	8.07	243
1.1435	Er	Er_2O_3	33.02	2,840	33.05	1,752	33.03	4,592	33.50	1,007
1.1421	Tm	Tm_2O_3	7.12	612	7.16	379	7.13	991	7.27	218
1.1387	Yb	Yb_2O_3	57.48	4,924	57.32	3,025	57.42	7,949	57.35	1,717
1.1371	Lu	Lu_2O_3	9.00	770	9.00	474	9.00	1,244	9.03	270
1.2699	Y	Y_2O_3	220.84	21,096	221.42	13,032	221.06	34,128	225.84	7,540
	Total REO			47,595		29,408		77,003		16,974

*** Readers are cautioned that this is not a mineral resource estimate. The mineral resources estimate for the Round Top Project is shown in Table 14-7.**

16.1.1 Mining Equipment

The mine production equipment will include an 11 cubic yard (yd^3) loader and three 70 ton trucks at full production. Two Sandvik D50KS drills will also be used. Table 16-2 list the estimated initial mine equipment requirements prior to production. Once production begins an additional 2 trucks, 1 explosive loader, and 1drill will be purchased in the first year.

Table 16-2 Initial Mine Capital Equipment List - Round Top Project

Model (Cat Equivalent)	Unit	Cost Capital	Units	# of Units	Total Capital
Cat 990H	Wheel loader*	$1,474	$(000)	1	$1,474
Cat 775	Haul Truck*	$1,025	$(000)	1	$1,025
Cat D7	Dozer	$630	$(000)	1	$630
Cat 16M	Motorgrader	$787	$(000)	1	$787
Cat 972K	Wheel Loader	$305	$(000)	1	$305
Sandvik D50KS	Blasthole Drill*	$817	$(000)	1	$817
	Powder Truck	$86	$(000)	1	$86
	Crane	$415	$(000)	1	$415
	Fork Lift	$46	$(000)	1	$46
Cat	Mechanics Trucks	$85	$(000)	1	$85
Ford	Pickups	$39	$(000)	4	$156
	Water Truck	$253	$(000)	1	$253
Total					**$6,079**
	Contingency	25%			$1,520
Grand Total					**$7,598**

*2 trucks, 1 explosive loader, and 1 drill will be purchased when mining commences in year 1.

16.1.2 Support Equipment

Support equipment will consist of a Cat 972 wheel loader and a Cat D7 bulldozer as the rock moving units. A Cat 16M grader will allow flexibility on the haul roads. A variety of other equipment is considered supplementary equipment to the production fleet.

16.1.3 Estimated Mining Costs

For the PEA, mining costs were estimated based on average annual usage numbers for the equipment. Hourly operating costs were based on information from the InfoMine, Mining Cost Service. The operations were assumed to be three 8-hour shifts per day, operated by four crews of 38 men. Average mine operating cost is estimated to be $1.90 per metric tonne. The breakdown is shown in Table 16-3.

Table 16-3 Mine Operating Expenditures

Description	LoM ($000)	Units	$Tonne RoM
Production			
Drilling & Blasting	$121,832	$(000)	$0.83
Loading & Hauling	$82,585	$(000)	$0.57
Total Production	**$204,417**	**$(000)**	**$1.40**
G&A			
Mine Support	$53,097	$(000)	$0.36
Mine Administrative	$20,491	$(000)	$0.14
Total G&A	**$73,589**	**$(000)**	**$0.50**
Total Mine Operating Expenditures	**$278,006**	**$(000)**	**$1.90**

17 RECOVERY METHODS

17.1 Process Description

There are several unit processing steps involved in the processing of REE containing ores. These include crushing, heap leaching, impurities removal, REE removal and separation of individual REE's. The crushing, heap leaching and final separation systems are based on conventional, proven technology. The removal of impurities and mixed REE's from the pregnant leach solution (PLS) is technology that is under development by an independent third party (Tusaar Corp).

The conceptual process flowsheet is shown in Figure 17.1. Limited testwork has been undertaken to date to validate heap leach process and produce PLS. Some of the PLS was provided to Tusaar Corp. for removal of impurities and production of REE product. The tests were partially successful and need further optimization in the next phase of the study. No testwork has been undertaken so far on metal separations. However, the technology is commercially used by the Chinese companies. It will also be evaluated in the next phase of testing.

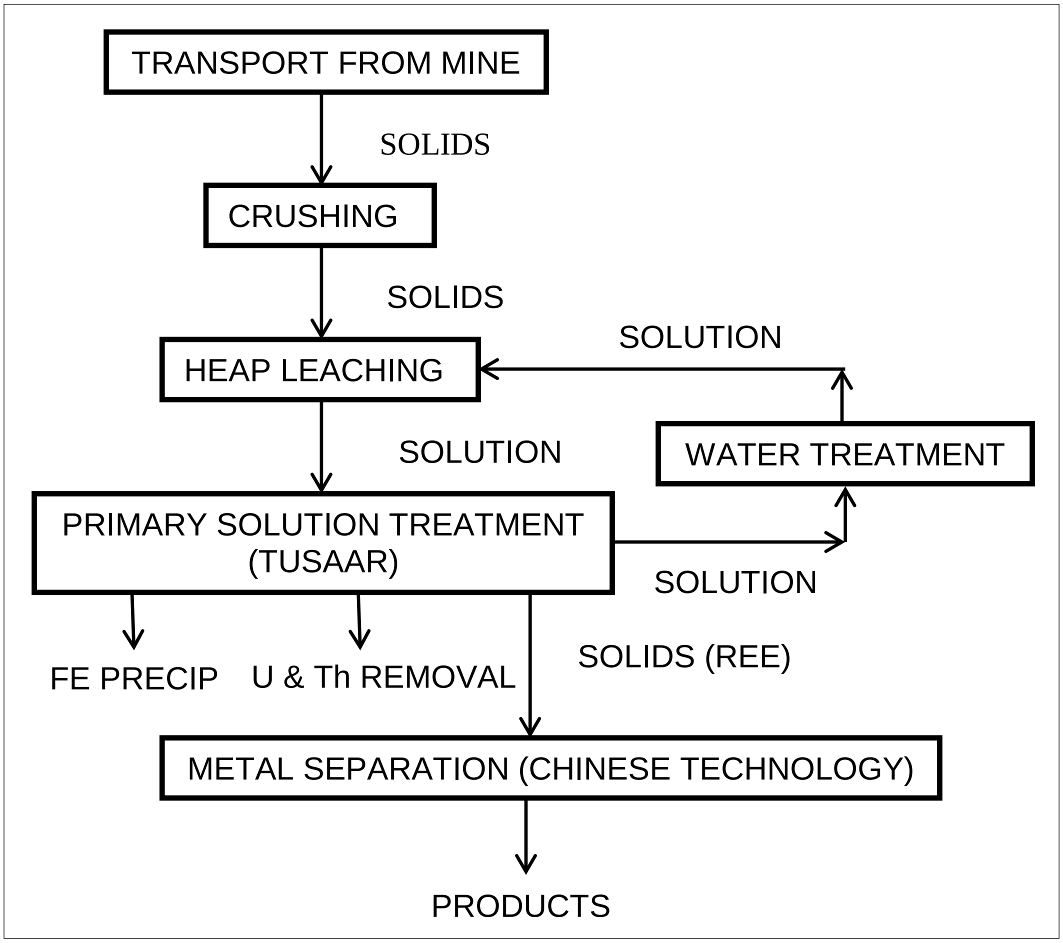

Figure 17-1 Simplified Process Flowsheet

17.2 Production Rate

The design parameters for capacity are shown below:

1. The Round Top Project is sized to process 20,000 metric tons per day of mined material going to the crusher and heap leach pads.
2. The crude mixed REE product stripped from the PLS using Tusaar technology will be about 8 to 10 metric tons per day and will be further processed by conventional Chinese designed technology to produce the separate REE's.
3. The plant will operate 24 hours per day, 365 days per year, with 95% availability.

17.3 Crushing Plant

The process design for the crusher will have the material reduced in size to 100% passing one half inch. The crusher is designed to process the entire daily production in two shifts.

The highlights of the crusher design are as follows:

1. The primary crusher will be a jaw crusher that will be located "in-pit" or close to the pit. The crushed material will be transported to the main crushing plant by overland conveyor.
2. The secondary and tertiary crushers will be closed with screens to remove "product" as it is made and also to ensure that the finished product is 100% passing one half inch.
3. The one half inch crushed material will be delivered to the heap leach stacking system by overland conveyor.

17.4 Leaching Facility

The leach pad will be initially built to handle two years of production. In the second year, the third year leach pad will be built to take year three product and so on. The annual expansion will be carried as sustaining capital in the economics section.

The highlights of the leaching facility design and operation follow:

1. The facility will be built to Texas Environmental Standards with an impermeable synthetic primary liner and a secondary liner with leak detection capability.
2. The primary liner will be covered with a crushed rock bedding layer to allow for stacking equipment to work on the heap surface.
3. The crushed material will be placed by conventional automated heap stacking equipment such as the Rahco system.
4. The pad is designed to take multiple lifts to take advantage of the high cost per square foot of completed liner system. The ability to raise multiple lifts will also have a positive impact on the annual sustaining capital to build the pad capacity for the next year.

5. Solution collection piping and associated pregnant ponds, barren pond and safety ponds will also be at least double lined with leak detection capability and conform to environmental requirements.
6. Sulfuric acid will be the lixiviant in use for the leaching of the valuable constituents from the material.
7. The resulting product of leaching will be a pregnant leach Solution (PLS) that will contain the REE’s as well as other elements including iron, aluminum, uranium and thorium. The PLS would then be further processed as described in section 17.5.

17.5 Primary Recovery System (Pre-Treatment)

This processing facility will remove impurities from the PLS, remove REE’s from the PLS and then return barren solution to the leach system for re-use.

Highlights of the processing system are summarized below:

1. Processing of the solution will start with adjusting the pH upwards with a base to allow for the precipitation and removal of iron.
2. The purified solution will then be passed through an activated carbon based media to selectively remove the actinides uranium and thorium. Either the saturated media itself or a stripped product will be disposed of in an environmentally acceptable fashion.
3. The third stage of removal will be a pass through a second activated carbon based media that will selectively remove all of the REE’s. The product of stripping the media will be the crude combined REE carbonate product that will advance to the elemental separation plant described in section 17.6.
4. Water treatment, if necessary, on the resulting barren solution and re-fortifying with sulfuric acid will be performed in ancillary equipment associated with this stage of processing. Aluminum will probably be the primary impurity remaining in the spent PLS. At the present time, the aluminum would be allowed to stabilize in the solution. A portion of the spent PLS would be bled off (removed) and separately processed through a selective water treatment plant that will probably employ Reverse Osmosis (RO) technology. This process will remove enough impurities from part of the flow to allow the recombined spent PLS (Barren solution) to be effective in leaching REE’s during the subsequent leach cycle.

17.6 Elemental Separation

Solvent extraction (SX) technology, currently designated and commercially used by the Chinese companies, will be utilized to separate, purify, and concentrate a number of metals including rare earth elements (REEs). The low capital and operating costs of SX plants in combination with ease of operation and production of concentrated metals near the mining operation make the SX type operation highly attractive from an economic view point.

A conceptual process flowsheet for separation of metals is shown in Figure 17.2. A brief description of the process is discussed in this section.

17.6.1 Elemental Separation-Process Description

The clean rare earth element carbonate precipitate filter cake will be rinsed with fresh water to remove any soluble impurities and then transferred to the Elemental Separation Process (ESP). There the solids will be dissolved in hydrochloric acid (HCl). The chloride rich solution will be subjected to multiple stages of separation via a SX process.

17.6.2 Solvent Extraction Concept

The separation of rare earths by solvent extraction depends upon the preferential distribution of individual rare earths between two immiscible liquid phases that are in contact with each other. One of the liquid phases is an aqueous solution and the other is a non-aqueous solution in the organic phase (solvent dissolved in an organic carrier). The two liquids are combined in a mixing stage, followed by a settling stage where the two liquid phases separate, with the organic constituent on top and the aqueous solution beneath. The organic and aqueous solutions are then directed independently to the next stage of separation.

There are many advantages to using SX as the process for rare earth separation, the principal of which is that he rare earth loading in the solvent/extractant can be very high (~180 gr. REO/liter), thereby allowing for processing highly purified feed solutions.

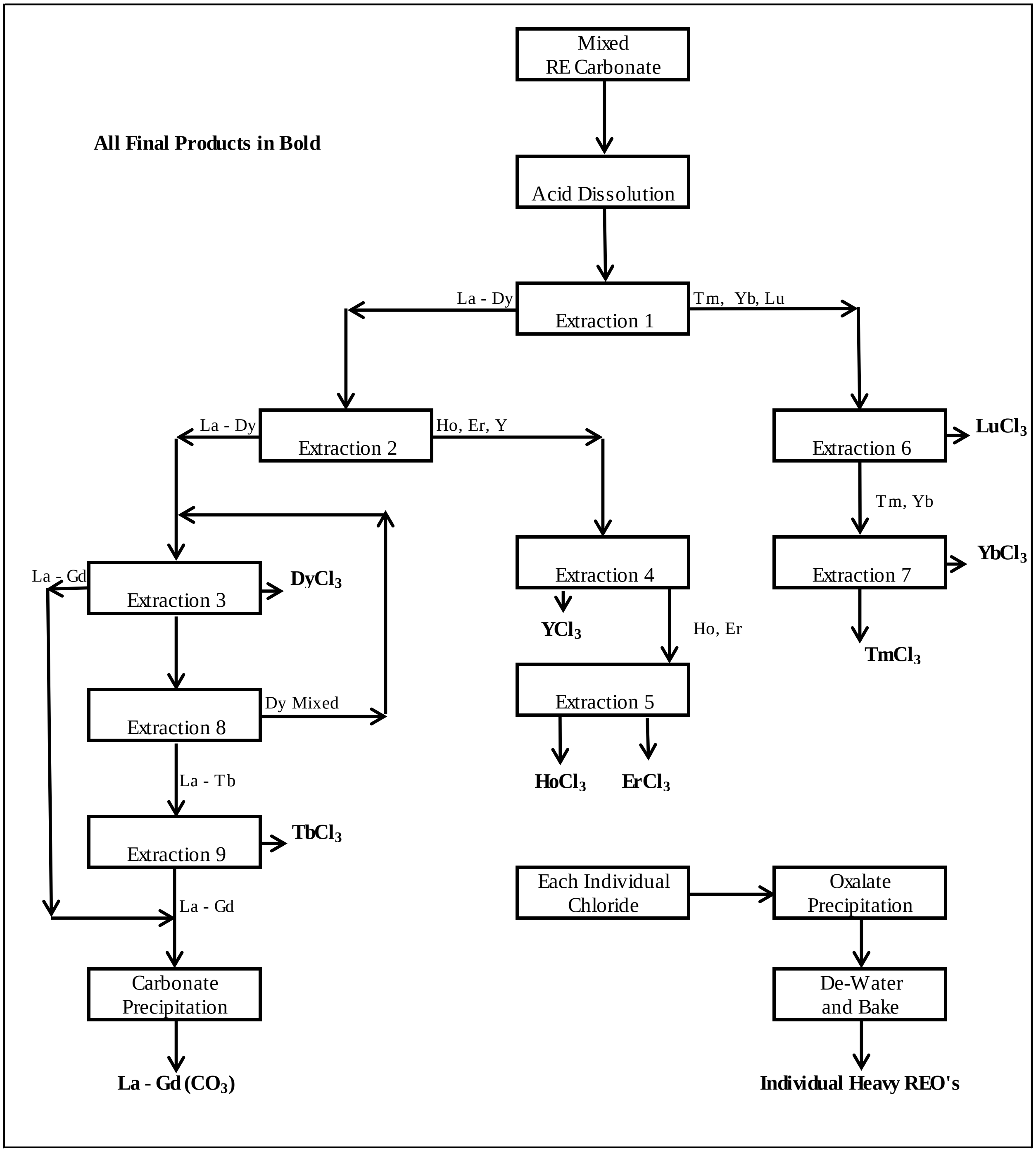

Figure 17-2 Heavy Rare Earth Separation Plant Flowsheet

Nine extraction lines (SX separation trains), employing over 530 individual vessels, would be required to produce: 1) a mixed light rare earth carbonate and 2) eight heavy rare earth oxide (REO) products with high purity. Based on current commercial element separation technologies, the eight REO products are projected to have a purity of greater than or equal to 99.9%.

The recoveries of the various REEs were calculated as follows:

1. For the heavy REEs, the 60 day leach extractions that were realized from the column leach test with the 75 g/l acid strength (Column 2) were used directly.
2. For the light REEs, the leach extractions were factored from the 75 g/l static leach test values adjusted by the ratio of Y and Dy extractions between the static leach test and the column 2 results.
3. The leach extraction values were then adjusted to account for recovery of 90% of the REEs in the purification process and 98% in the separation process.

The mixed light rare earth carbonate concentrate will be precipitated with the use of sodium carbonate (Na_2CO_3) and will contain the light rare earth elements of La, Ce, Pr, Nd, Sm, Eu and Gd as carbonate solids. The mixed carbonate product will be dewatered (but not dried), and will be marketed to others for final separation.

The eight heavy REO products will be precipitated from the final aqueous streams utilizing oxalic acid ($H_2C_2O_4$). The REOs will then be dewatered (centrifuged), and batch calcined at 800°C to 900°C, in individual static ovens, to produce the final oxide products.

The calcined REO products will be allowed to cool, and then screened and packaged in suitable containers, with plastic liners, for shipment to market. The individual REO products produced will be: Tb_4O_7, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3, Lu_2O_3, and Y_2O_3.

The spent solutions, recovered from the precipitation and de-watering of the oxalate rare earth products, will contain a mixture of rare earth chlorides (projected losses) along with losses of the organic solvent and high concentrations of sodium chloride. These water waste streams will be treated in a separate process to recover the organic solvent and a mixed rare earth solid precipitate that will be recycled back into the ESP to reduce overall losses.

The final organic-free aqueous solution, recovered from the precipitation of the rare earth oxalates, will contain primarily sodium chloride. This aqueous liquid will be treated by reverse osmosis (RO) to recover clean water for recycle to the ESP facility. The waste from this RO purification stage will be sent to lined evaporation ponds for disposal.

18 PROJECT INFRASTRUCTURE

The proposed mine and process plant site locations are presented in Figure 18-1. All skilled and unskilled staff will be sourced from local towns, principally El Paso where they will reside and be transported by bus from El Paso on a daily basis and consequently no provision has been made for on-site housing facilities, although TRER's ownership of fee acreage in the area will leave the option open for on-site housing for key personnel.

The mine and process plant will operate on either a two-12 hour or three-8 hour shifts per day, 24 hours per day, seven days per week.

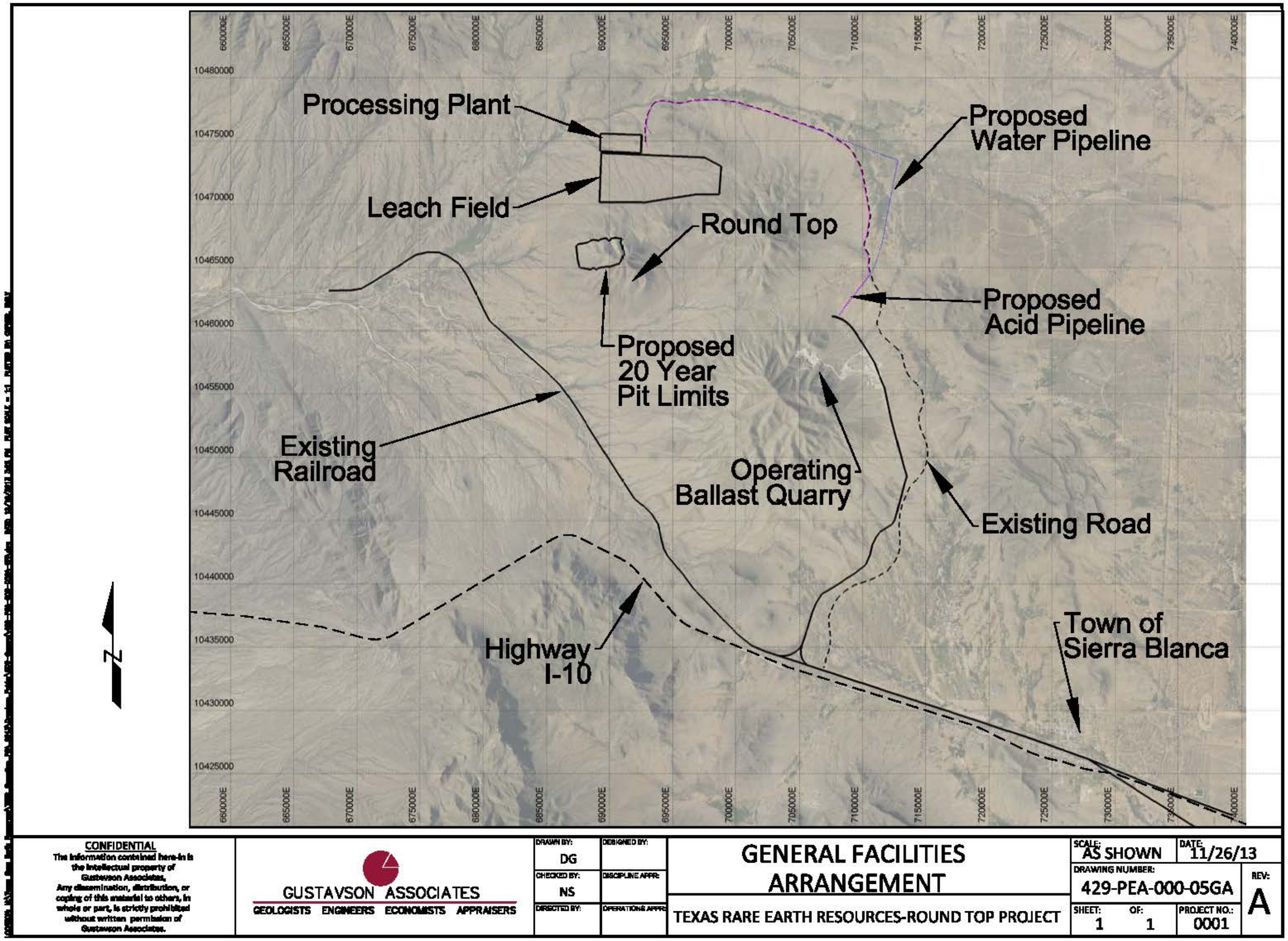

Figure 18-1 General Facilities Arrangement

18.1 Facilities

18.1.1 Administration/Office Building

There will be one administration building which will house management and staff and serve as the change house to service the mine and processing facility. The office and administrative buildings will include offices, toilet facilities, and lunch room etc. The office will also have adequate rooms for training of personnel.

18.1.2 Warehouse and Laboratory

One warehouse and one laboratory are planned for the project. The warehouse and laboratory will be located at the process facility. The laboratory will contain adequate equipment for ore control and management of processing.

18.1.3 Truck Shop and Maintenance

The truck shop will consist of three large bays and a single wash bay with sufficient work space to conduct maintenance on the mine truck, loaders and semi-trailer trucks. Maintenance on the hydraulic or electric shovels will be external. The truck maintenance shop will likely be located adjacent to the processing facility site.

18.1.1 Processing Facility

A Processing facility will be constructed. The processing facility will consist of heap leach pads, solution ponds and equipment for the treatment of pregnant solutions in order to recover rare earth elements. Purification and separation facilities will be housed in the same processing facility.

18.2 Roads

Temporary and permanent roads will be constructed to support the Round Top Project. Temporary access roads will be constructed with an average 50 ft wide running surface and a total average road disturbance width of 70 ft. Roads will be constructed using standard construction practices and to minimize surface disturbance, erosion, and visual contrast, and to facilitate reclamation. Roads will be constructed following Best Management Practices (BMP). Temporary access roads will be reclaimed as soon as they are no longer needed. Temporary road reclamation will include re-grading and reseeding the road area with an appropriate seed mix.

Access roads during operation will be 2-way, 2 lane gravel roads. Each lane will be 20 ft wide for a total of 40 ft running surface. Road shoulders will be between three and five ft wide.

Cattle guards will be installed on gravel and other access roads, where necessary. Cattle guards will be constructed to a load rating appropriate for anticipated truck traffic. Culverts would be placed to allow pre-existing drainage patterns to prevail. Topsoil will be re-spread over the borrow ditch areas up to the running surface after completion of grading.

18.3 Security

The guard house at the main gate to the mine site will be manned around the clock. Standard security measures and operating procedures will be followed to ensure the security of the site.

The perimeter of the mine site and leach facility will be fenced to keep grazing cattle out.

18.4 Septic Systems

Currently the process plant, administration building, laboratory warehouse and maintenance facility will likely use septic systems. Portable toilets will be placed at the mining areas, crushing areas and others where necessary.

18.5 Water

Surface water management facilities will be constructed to minimize potential adverse impacts of runoff from the Round Top Project site to downstream receiving areas. Controls will ensure that non-point sources of suspended solids and other potential surface water contaminants are contained and not released from the project area.

There is a single perennial drainage that runs through the property that will need to be rerouted. Rainfall runoff and run-on will be managed by constructing protective berms around all disturbed areas and surface facilities at the mine site, process facilities and roads and rail locations. Collection ponds will be constructed immediately as required and will be identified during the Pre-feasibility study. We have assumed the Project will have to provide containment of the 100-year, 24-hour storm event. To further minimize runoff and mass movement of sediments, stockpiles (except the waste rock from mine excavation) will be revegetated and lined as appropriate.

Process water for the project is planned to be supplied by a well-field located some 3 miles east of the plant site. There are four existing wells in this area. Data obtained to date suggests that this water supply is adequate to supply the proposed heap leach operation. TRER is currently negotiating an option with the Texas General Land Office to develop this area. The principal aquifer in this area is the Cretaceous Cox sandstone. The prolific Permian carbonate rocks at depth have not yet been tested. Figure 5-1 shows the location of the existing wells and the area to de developed. The quality of the water is expected to be adequate for process water needs and the water will require treatment to be potable.

It is anticipated a reverse osmosis water treatment system will be installed to deliver potable water to the office, warehouse, and process plant.

Fire water will be supplied to the office, warehouse/laboratory, truck shop, and process plant from a water storage tank located adjacent to the processing facility. Diesel driven pumps will deliver fire water via underground piping to fire hydrants located next to the various buildings.

18.6 Power

Power is currently supplied to Sierra Blanca by El Paso Electric Company. El Paso Electric has approximately 1,643 megawatts of generating capacity. The existing line into Sierra Blanca is scheduled to be upgraded by El Paso Electric. For this study, it is assumed that TRER will be responsible for building a line that can carry adequate power from Sierra Blanca to the proposed site.

18.7 Fuel

Diesel will be purchased in bulk and stored on site at a refueling station. Delivery of diesel by rail in leased tank cars is anticipated. Diesel will be stored in tanks with adequate capacity and fuel trucks will be used to refill the support equipment. Most vehicles on the mine site will run on diesel; eliminating the need for gasoline, which will be purchased at gas stations in Sierra Blanca. Light duty diesel trucks will refill at the fuel station. All buildings will be heated with electricity or propane delivered from and stored in tanks located on the project site.

18.8 Communications

Communications will be comprised of separate systems including: optical fiber, telephone, and radio. Systems will run independently. In the instance one system of communication is lost, other systems will be available.

18.9 Product Storage and Loading Facilities

Each of the products will be stored separately in appropriate containers in a secure location. The storage facility will be climate controlled. The material can be shipped to customer via vehicle transport or rail.

18.10 Heap Leach Facility

The Heap Leach Facility will be sized to process and contain all material from the mine. The Heap leach facility will be lined and have a leak detection system. The Run of Mine material is currently assumed to be non-hazardous. The Heap Leach Facility is only conceptual at this point and further detailed design including a geotechnical investigation will be undertaken during the pre-feasibility study.

18.11 Waste Facilities

Due to the geology of the Round Top Project there is not expected to be any material waste to dispose of for this project. Any material taken from the mine is expected to be clay, which will be used to line the Heap Leach Facility. All topsoil will be stored and used for reclaim at the end of the project.

19 MARKET STUDIES AND CONTRACTS

Throughout this section, "Roskill, 2011 Rare Earth & Yttrium: Market Outlook to 2015," is referenced to support the metal pricing used for this PEA. The Roskill report is a standard industry reference and the Mr. Donald E. Hulse, a qualified person, considers the use of this information within the PEA to be reasonable. Mr. Hulse compared the results of the Roskill report with contracts in the public domain and with published prices for some of the elements and is of the opinion that the pricing presented herein is within industry norms and suitable for use in the economic analysis.

Evaluating the markets for the rare earth elements is both difficult and complicated because there are 15 individual elements including yttrium all with different properties and applications. The fact that most are found in the same deposits in varying proportions is their principal similarity. Analysts tend to divide them into two groups, the light rare earth elements (LREE) and the heavy rare earth elements (HREE). This subdivision is made based on the atomic weights, which increase from lanthanum to lutetium with the dividing point being between gadolinium and terbium. Yttrium technically is not a rare earth but owing to its many chemical similarities is included in the heavy rare earth classification. Other subdivisions are made such as listing the critical rare earth elements (CREO), which include some of both heavy and light, and some writers also further add a mid-range category called the SEGs, samarium, europium, and gadolinium. There has been much confusion in the market and among analysts over the last four years in dealing with the differences and similarities of these elements but there now is a growing understanding of the necessity of analyzing these elements individually rather than treating them as one commodity or basket of commodities.

Four major sources and several minor sources are used in this evaluation. The Roskill 2011 report on the rare earth elements, J. P Morgan's 11 July 2013 market study, the Goldman Sachs 24 July report and research by the Industrial Minerals Company of Australia (IMCOA) in conjunction with the Center for Research for Energy and Minerals Economics of Curtin University, Western Australia are our major sources. Minor sources include references on laser and optical technology, various defense technology journals and information on hybrid electric over the road trucking development. The most recent Roskill report was issued during the peak of REE prices in 2011 but is, in our opinion the most comprehensive of the reviews. The J.P. Morgan, Goldman Sachs and IMCOA reports differ marginally but agree that the REE supply/demand and pricing trends have resumed the growth patterns that were in effect prior to the dislocation of 2011-2012

19.1 Geopolitical Factors

The conditions affecting the rare earth market at this time are the result of a long-term strategic policy by the Chinese government to develop their REE technology and to enhance their economic influence internationally. The growth of their internal demand is an outgrowth of this policy. Consumer products for export and domestic use, telecommunications and computer equipment, power drives for electric bicycles and permanent magnet motors for the automotive and other industries and increasingly their own defense industry needs are thought to be the principal areas of growth internally. The Rest of World (ROW) consumption of REEs declined by nearly 4% per year between 2005 and 2010, partly as a consequence of the global economic slowdown, the increase in China’s downstream processing, and the tightening of China’s REE export quotas. China's policy is to influence their ROW REE consumers to move their downstream processing facilities to China. This policy has caused an erosion of REE technology capabilities in the ROW and is causing concern in the effected countries, particularly the United States, Japan and Korea. The strong reliance on these elements by present and future defense technology is a large part of this "concern". China's development of technologically advanced military capability, heavily dependent on rare earth technology, is introducing further instability into the strategic Rare Earth equation.

19.2 Substitution

There has been discussion among analysts and others as to the degree of substitution that may occur as usage increases and as prices appreciate. There is some evidence that substitution did occur during the price run up of 2011-12. Substitution appears to have mostly affected the lanthanum and cerium market. The refining and polishing industries were the sectors most affected by the price spike. Whether or not end users will return to using these metals now that prices have returned to normal growth levels will remain to be seen.

There is a study the National Academy of Sciences recently released (2 December 2013) that analyzes the potential of sixty-two important metals for substitution for their various applications. This study ranks these metals from 0, complete substation possible, to 100, no possible substation. Among the REE's yttrium, europium and dysprosium rank 100, no substitution. Thulium and ytterbium rank 88 and lanthanum 75. Cerium, gadolinium, terbium, holmium, erbium and lutetium rank 63. Only Praseodymium, neodymium and samarium show any degree of substitutability scoring 41, 41 and 38. This study strongly suggests that at current prices there is not a great likelihood that any of the REE's will suffer substitution.

19.3 Supply and Demand by Element

The supply of cerium is expected to exceed demand starting in 2013, due to its relative abundance in most deposits and the limited uses for cerium in mass-produced technologies. Some experts feel that the use of lanthanum has growth potential due to its use for batteries, catalysts and in optical glass, however, even though these demands are forecasted to grow, supply appears to be adequate.

The demand for REEs used in magnets is expected to require new mine supply to meet demand forecasts. The Table 19-1 calls for an 11% annual increase in demand for the magnet metals. The forecast demand growth for neodymium and praseodymium is expected to be 11% to 13%

per year while estimated supply rates are projected to grow by 10% to 11% per year. The supply of dysprosium is forecasted to grow by 3% to 4% per year through 2015. While there is some indication that the use of dysprosium in magnet alloys is being reduced the growth of overall dysprosium demand is expected to be larger than any savings from reducing its demand in individual applications.

Five REEs, neodymium, europium, terbium, yttrium and dysprosium have been termed "critical" (CREO's) by the United States Department of Energy in their 2011 Critical Materials Report on the basis of future supply/demand dynamics and their importance to developing technologies. They forecast a shortfall of the CREO's neodymium, europium, terbium, dysprosium, and yttrium. According to Roskill, rare earth production capacity of CREOs will not increase prior to 2015. The demand sector for these CREOs is in magnets, where praseodymium, neodymium dysprosium and terbium are important and in phosphors, where Europium, terbium and yttrium are all critical components Yttrium is also an element used in lasers.

The US Navy's recent decision to build hybrid electric drive power trains in all future large warships based on permanent magnet direct drive motors and the Army's shift to hybrid electric drive in future combat vehicles can only be accomplished if the DoD can acquire a secure supply of neodymium, praseodymium, terbium, dysprosium, and/or holmium.

A number of the currently little used heavy rare earth elements, holmium, erbium, thulium, ytterbium and lutetium are known to have important and unique qualities. The Rosskill report notes that the commercial development of these HREE's has been retarded by the lack of reliable supply. Holmium, for example can be used in addition to or in place of dysprosium and terbium to modify the behavior of rare earth permanent magnets. Therefore, if an adequate supply were available, holmium has potential to be of a value as high as are terbium and dysprosium today. Erbium and ytterbium in particular are vital in production of high powered lasers. Publicized intent of the Defense Department to shift to laser weapons for the Navy and Air force may be dependent on a secure supply of these HREE's. Holmium and thulium likewise have laser applications that have been retarded by lack of dependable supply.

Because of their importance to the economics of the Round Top Operation, we will cite the J. P Morgan 11 July 2013 report on the potential future uses of these elements:

19.3.1 Holmium

Holmium is one of the least abundant of the rare earth elements, which is unfortunate, since it has the strongest magnetic moment (attraction) of any element. It is found in mineable quantities in relatively few rare earth element ore bodies. In those cases where it is most abundant, it still makes up, typically, less than 2 percent of the ore mass. While expanded mining and recapture from waste may increase available quantities of this material, it is likely to remain scarce. Small quantities of Holmium, however, can be used with other elements, to significantly increase the strength of magnets.

Holmium finds modest employment in the production of very powerful magnets and in nuclear control rods (due to its ability to absorb large quantities of stray neutrons). Other, more common, elements are probably more appropriate to nuclear applications, due to the scarcity of this element and its other potential applications. Holmium lasers are used as surgical lasers in the medical and dental fields, as well as in fiber optic communications. Holmium is also used in several analytic instruments, as a colorant in glass, and as a dichloric colorant in cubic zirconia for jewelry. The commercial potential of this element has not been fully explored, and may expand radically with increased supply.

19.3.2 Erbium

Erbium is a relatively scarce REE, completely lacking in some rare earth ore bodies, and representing up to 5% of the recoverable metal in others. Erbium is used in the production of amplifying lasers for fiber optic cable communications. Erbium in glass cables reduces signal loss substantially. Lasers made with this element are widely used in medical, dental and dermatological applications. Strong lasers, combining erbium and ytterbium, are used in metal cutting and welding. This element is also used as a pink colorant in glass, ceramics and cubic zirconia. It is a uniquely stable colorant in certain applications. As with many other REE's, erbium absorbs free neutrons effectively, and thus is used in control and limitation of nuclear reactions in nuclear power generation facilities.

19.3.3 Thulium

Thulium is an exceedingly scarce metal. It is the rarest of the rare earth elements. Thulium is found only in very small quantities (up to 1/2 of 1% of oxides) in some rare earth ores. Like promethium, thulium is currently so rare that it has little influence on supply/demand dynamics in the world of rare earth element mining, distribution, or in the manufacturing of end-use products.

The price of thulium limits its utility, but, unlike promethium, which will never be mined on this planet in commercially important quantities, thulium availability will change with expanded production. The element can be used in medical (and other) lasers, as well as to make safer X-ray equipment. The element also shows potential in the development of superconductive materials. Applications (and thus demand) for thulium may well expand with greater research and material availability.

19.3.4 Ytterbium

Very few rare earth ores contain appreciable concentrations of ytterbium. Notable among these, are locations in Malaysia and Canada, as well as the Chinese REE bearing laterites. Chinese laterites produce, essentially, all ytterbium used in the world today (about 50 metric tons), though other deposits are richer in this scarce REE, and could potentially produce larger quantities. Supply limitations strongly inhibit many known applications of this element. Rapidly expanding potential applications far exceed even the most robust estimates of future increase in supply.

Ytterbium is an astoundingly useful element employed in technologies such as solar electric cells, high performance steel alloys, high-powered lasers, anti-forgery inks, night vision technology, and stress measuring instruments. Its potential market demand for applications as an alloy component, as fiber optic amplifier, and in solar electric generation, as well as others, may expand substantially with greater availability of the resource.

19.3.5 Lutetium

Lutetium is astoundingly scarce, even in the richest REE ores. It ranges from 0% to 1% of recoverable metal in most ores, but most commonly represents 0.1% or less. World production is only around 10 metric tons per year, and the prices of the metal and its oxides are correspondingly high.

Lutetium has been used, on a small scale, as a chemical catalyst and in the petroleum refining process. It also has current medical applications, including use in cancer treatment and as a sensor material in PET scans. If price and availability change, lutetium shows substantial promise in a variety of applications in analytic tools, advanced computer memory, manufacturing, the nuclear industry, in phosphors, and in both medical diagnosis and treatment. Supply limitations and high prices constitute substantial limitations on use of this element.

19.4 Rare Earth Demand by Application

A summary of the global demand for REE by application is presented in Table 19-1 including 2016 projections of demand and the primary growth drivers for each application.

Table 19-1 Global Rare Earth growth by Application

Application	2011 Demand (metric tons)	2016 Demand (metric tons)	CAGR (2011-2016)	Growth Drivers
Magnets	21,000	36,000	11%	Automotive, Hybrid/Electric Vehicles, Other applications requiring small, efficient high powered electric motors.
Metal Alloys	21,000	30,000	7%	NiMH Batteries, Metallurgy
Catalysts	20,000	25,000	5%	Petroleum Refining, Emission Control in Vehicles
Polishing	14,000	18,000	5%	Flat Panel Displays, Consumer Electronics
Glass	8,000	10,000	5%	Consumer Electronics, Specialty Glass
Phosphors	8,000	12,000	8%	Energy Efficient Lighting
Ceramics	7,000	10,000	7%	Electrical/Engineering Applications
Other	6,000	19,000	26%	Lasers, Weapons Systems, Optics, New Applications
TOTAL	105,000	160,000	9%	

Source: Prof. Dudley Kingsnorth, IMCOA/Curtin University, TRER Market Research

Table 19-1 has been compiled from data presented by Prof. Dudley Kingsnorth in conjunction with the Industrial Minerals Company of Australia and the Center for Research for Energy and Minerals Economics of Curtin University, Western Australia at Berlin, 16 April 2012.

19.4.1 Magnets

The largest use of REE is in magnets. The 2011 consumption was approximately 21,000 tonnes oxide per year. The elements now used in magnets are neodymium, praseodymium, gadolinium terbium and dysprosium. Roskill projects a 11-13% growth per annum through 2015 and J. P. Morgan 7% per annum through 2020. There are a number of factors that could decrease these growth projections such as the failure of wind energy to live up to its hype and reduced content in magnets. This downside risk is mitigated by factors that could lead to a substantial increase in magnet demand such as expanded use of hybrid electric propulsion in marine and in the automotive industry, particularly the trucking industry.

19.4.2 Metallurgy

Alloying used approximately 21,000 tons of oxide in 2011. REE's used principally in Nickel-Metal-Hydride batteries. Some of this demand will be lost as Li-ion batteries gain market share. Lanthanum, cerium, praseodymium, neodymium, and samarium are the REE's used in metallurgical applications. Roskill projects a demand growth of 10 to 15% to 2015 but falling after that while J. P. Morgan calls for a demand growth of 4% through 2020.

19.4.3 Catalysts

Catalysts, both auto catalytic converters and other uses, used an estimated 20,000 tonnes in 2011. The 2012 consumption was significantly down from 2011. The spike in prices It is thought that the price spike has promoted substitution of other materials for REE in the refining industry but it is likely that usage will recover now that prices have stabilized. Lanthanum, cerium, praseodymium and neodymium are the REE's used in Catalysts. J. P. Morgan projects demand growth of 3% through 2020.

19.4.4 Polishing

Polishing used 14,000 tons in 2011. It is thought that REE consumption in the polishing sector was significantly reduced by the price spike in 2012. It will remain to be seen if REE will resume its past use in the polishing sector. Lanthanum, cerium and praseodymium are the REE's used in this sector.

19.4.5 Glass

The glass industry used some 8,000 tons of REE 2011. The REE used in this sector are lanthanum, cerium, praseodymium and neodymium.

19.4.6 Phosphors

Phosphor demand was some 8,000 tonnes in 2011. The REE's used are lanthanum, cerium, europium, gadolinium, terbium and yttrium. There will be a change in the dynamic of this sector as traditional use gives way to LED displays and lighting. There is some disagreement among analysts of the effect of this transition with some believing there will be a decline of REE use in this sector while others believe expanded uses and increased size of the equipment the LED's are used in, TV, computers etc., will lead to a net gain. J. P Morgan projects a 6% decrease per annum through 2020 while IMCOA projects an 8% increase through 2016.

19.4.7 Ceramics

Ceramics accounted for 7,000 tonnes in 2011. REE's needed are lanthanum, cerium, praseodymium, neodymium, and yttrium. IMCOA predicts a 7% increase in consumption through 2016.

19.4.8 Other

This category accounted for 6,000 tonnes in 2011. The dramatic projected growth of this sector shown in Table 19-1 will, in our opinion, be driven by laser and optical technology and their defense applications. It is likely that this sector will see an increase in use of the "rare" REE's, holmium-lutetium if a dependable supply is created.

19.5 Round Top Supply

It is unclear whether or not these various analyses take into account the planned output from the many developing REE deposits worldwide or how the failure of many of them get into production would affect the supply/demand equation. Many of these deposits would be able to supply significant amounts of the high value HREE's but cannot be economically viable without a market for the LREE's. Round Top is in the fortunate position of being to operate profitably without having to market any of the LREE's. Regardless of the fate of these developing deposits, Round Top promises to be an important source of the strategically vital HREE's outside of China.

19.6 Rare Earth Pricing

Forecasting REE prices is difficult given the wide range of applications and the uncertainty regarding both China supply and the supply from new projects. Concern over Chinese supply caused an irrational run up of all REO prices during the 2011 with a resulting precipitous decline during 2012. This decline persisted through the first half of 2013 but appears to have stabilized and prices have resumed a growth rate based upon supply and demand. Figure 19-2 illustrates the recent volatility for rare earths

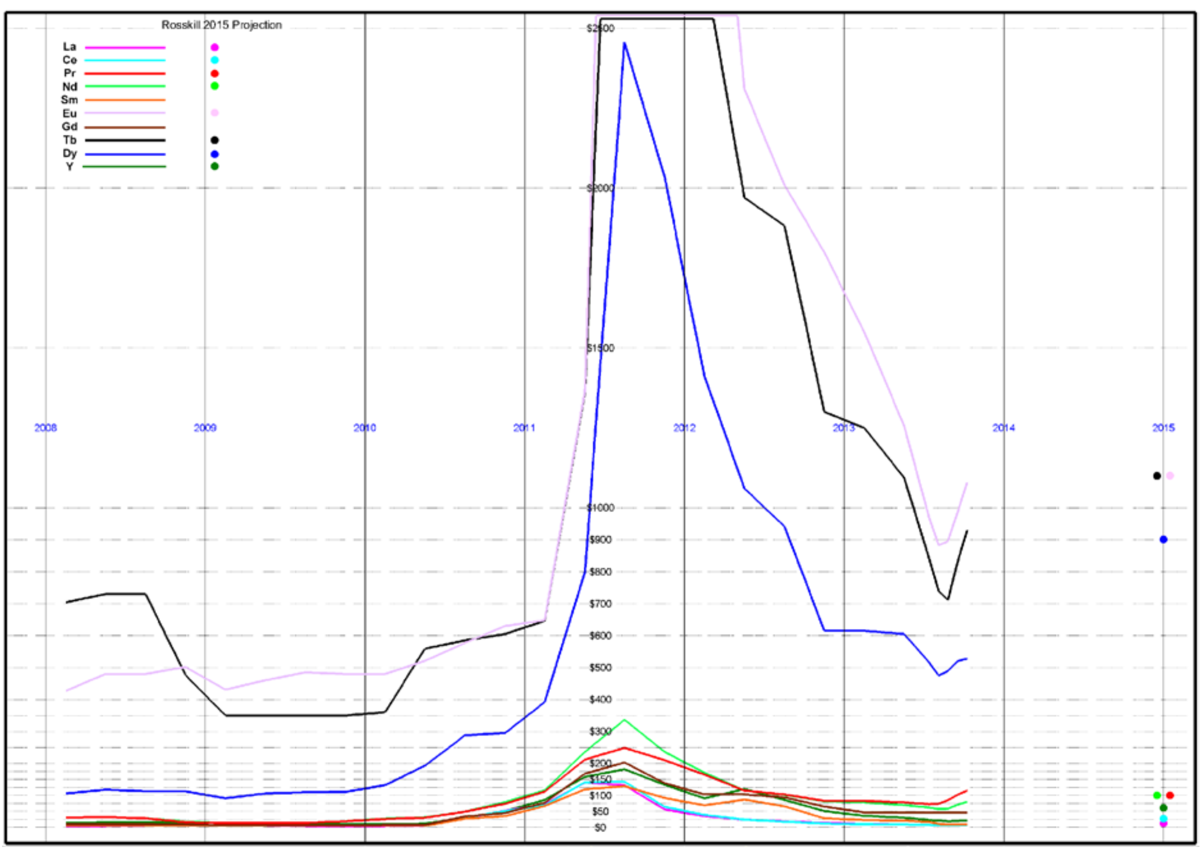

Figure 19-1 Historical Prices

Owing to the difficulty of forecasting prices and the uncertainties of supply in the future, this analysis is based on the spot prices of the various REE's. Table 19-2 shows the prices used and the sources. The LREE's are discounted 50% and will be sold as a carbonate concentrate.

Table 19-2 Economic Analysis Prices

Rare Earth Metal Pricing ($/Kg)				
Element	**Metal Pages Price Sept. 2013**	**HEFA Direct Quote Nov. 2013**	**Discount Factor**	**Price Used in Economic Model**
Y	$ 22.00			$ 22.00
La	$ 6.00		50%	$ 3.00
Ce	$ 7.00		50%	$ 3.50
Pr	$ 115.00		50%	$ 57.50
Nd	$ 80.00		50%	$ 40.00
Sm	$ 9.00		50%	$ 4.50
Eu	$ 1,080.00		50%	$ 540.00
Gd	$ 47.00		50%	$ 23.50
Tb	$ 930.00			$ 930.00
Dy	$ 528.00			$ 528.00
Ho		$ 350.00		$ 350.00
Er		$ 125.00		$ 125.00
Tm		$ 1,025.00		$ 1,025.00
Yb		$ 190.00		$ 190.00
Lu		$ 1,400.00		$ 1,400.00

19.7 Rare Earth Carbonate Pricing

The conventional processing circuit used in this analysis is planned to produce a mixed carbonate concentrate for the LREE's (lanthanum, cerium, praseodymium, neodymium samarium europium and gadolinium). REE carbonates are not typically sold on the open market, but are usually sold to separation facilities in China for further processing. The pricing structure for carbonates is not reliable. The economic analysis assumes the pricing as 50% of the oxide value provided by Metal-pages.

19.8 Contracts Sales

TRER will have to develop sufficient product samples from bench scales tests of REE material for sale in order to be in a position to enter into memorandum of understanding (MOU) or letter of intent (LOI) agreements with intended end users prior to advancing beyond pre-feasibility. The major focus of the MOU/LOI's will be toward the sale of potential CREEs that will be in demand past 2015. TRER will also have to enter into MOU or LOI agreements with downstream REE refiners to increase potential value of the carbonates. Although the **[Roskill]** market study shows a solid projected demand accompanying the increasing use of electronics, securing these agreements in advance will provide a measure of protection to the Project revenue.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental

20.1.1 Preliminary Evaluation of Potential Environmental Impacts

At this stage of project planning, the anticipated environmental impacts can be categorized into the following main categories:

- Potential impacts to the environment resulting from the storage of mine waste including:
    - Additional potential that the waste may be considered hazardous, and
    - Additional potential that the waste may contain naturally occurring radioactive material,
- Potential impacts to water quality resulting from mine operations and the storage of mine waste;
- Potential impacts to air quality resulting from particulate matter and emissions;
- Site reclamation following completion of mining activities;
- Potential impacts to known and/or unknown archeological or cultural artifacts; and
- Potential impacts to threatened, endangered, or sensitive species of vegetation and/or wildlife.

These broad categories will be thoroughly analyzed through the environmental impact analysis process, which will occur with oversight and review by federal, state, and local regulatory agencies. The following section on permitting will provide a summary of the major federal and state environmental permits that may be applicable to the Round Top Project. Permitting will be reviewed in greater detail as part of the pre-feasibility study.

20.1.2 Currently Held Permits for Exploration activities

All exploration drilling has been complete and TRER does not currently hold any exploration permits. If bulk samples are needed then TRER will obtain the necessary permits from the GLO. For all future geotech drilling, the permits will need to be obtained through the GLO. The GLO is the only agency that TRER will need to deal with to obtain exploration permits.

20.1.3 Expected Future Permits

The permitting process will most likely occur cooperatively and concurrently with the applicable state and federal agencies. Steps needed to obtain state and federal permission to operate this Project will be refined as the project details develop. The following paragraphs will highlight the main areas of consideration, as well as a brief description of the permits which may be required. It is currently understood from discussions with the Texas agencies, that the main areas of concern will be waste handling and storage, water quality and management, and air quality.

Also, permitting efforts will likely have to consider the project's potential impacts to environmental considerations like wildlife, vegetation, and cultural resources.

Texas Commission on Environmental Quality (TCEQ) does not have a sector specifically charged with hard rock mining, nor does it require an operating permit specific to mining. Because Texas has a very limited hard rock mining industry, TRER has an opportunity to work collaboratively with the agencies to walk through the permitting process in an efficient and comprehensive manner.

The largest permitting issues will be for the leach facility and air quality permit for the Project. In addition, protection of water resources will also be an important factor, as it is with any mining project. TRER will have to be pro-active in their approach to ensure statutory boundaries are maintained and demonstrate that the proposed Project, and all associated plans and mitigations, will meet or exceed regulatory requirements.

20.1.4 Current Permitting Efforts

TRER has initiated preliminary discussions with TCEQ concerning the permitting process. TRER also has engaged a team of experienced advisors and is developing its strategy for the permitting process.

20.2 Permit Requirements

20.2.1 List of Permits and Registrations

Table 20-1 includes major federal and state environmental permits that may be applicable to construction and operation of the Project

Table 20-1 Preliminary Permit Summary

Media	Permit	Agency	When Required
Air	New Source Review Permit to Construct	State TCEQ	Must be obtained prior to the start of construction.
	Title V Federal Operating Permit	US EPA	Application for permit must be filed prior to operating
Water	Construction Storm Water General Permit	State TCEQ	In advance of commencement of construction
	Industrial Storm Water Multi-Sector General Permit (MSGP)	State TCEQ	Prior to start of operation
	Public Water System Authorization	State TCEQ	Approval must be obtained prior to use of non-municipal water as drinking water source
	Water Rights Permit	State TCEQ	Must be obtained prior to using surface water
Operations	Petroleum Storage	TCEQ	Prior to storage of petroleum products on site
	Explosives permit	US Bureau of Alcohol, Tobacco, Firearms, and Explosives	Required prior to storage and use of explosives
Waste	Hazardous or Industrial Waste Management, Waste Streams, and Waste Management Units Registration	State TCEQ	Registration number must be obtained prior to engaging in regulated activity
	EPA ID Number for Hazardous Waste Activity Hazardous Waste Permit RCRA	U.S. EPA through the State TCEQ	ID number must be obtained prior to engaging in regulated activity
	Hazardous Waste Permit (including financial assurance)	State TCEQ	Must be obtained prior to commencement of hazardous waste treatment, storage, or disposal activities.
	Radioactive Material License	State TCEQ	Must be obtained prior to possession of materials containing NORM waste, as defined by THSC 401.003(26)

401 Permit, Certification of Texas State Water Quality Standards

The proposed operation will be a zero discharge operation so it is unlikely that this permit will be needed. If so, TCEQ will also be required to provide certification that the discharges from the project area meets state water quality standards, also known as the 401 certification. To make this determination, detailed technical information will be needed for things such as avoidance of or minimization of impacts to WUS, characterization of waste material, design aspects of the processing plant and tailings storage facility, as well as an understanding of the hydrogeologic setting of the impoundment site. Because of the size and scope of the Round Top Project, it's likely that the joint federal and state review required to issue 401 and 404 permits will be the most likely means of initiating the NEPA (EA or EIS development) process.

Texas Pollution Discharge Elimination Permit

If there are plans to discharge industrial waste waters into jurisdictional waters, TRER will be required to obtain an Individual Industrial Waste Water Permit from the TCEQ and the Texas

Pollution Discharge Elimination System (TPDES). The TDPES permit will require that industrial waste water meets the State's water quality standards prior to entering jurisdictional waters, which may require water treatment before discharging. At this point, a discharge is not anticipated for the Round Top Project.

Industrial and Hazardous Waste Permit

If the waste that is to be stored at tailings facility is classified as hazardous materials, an Industrial and Hazardous Waste Permit (IHW) will be required from the TCEQ. As mentioned earlier, the Bevill Amendment of the RCRA excludes certain mine wastes as being categorized as hazardous that result after the beneficiation process TRER will most likely go through an extensive review of the anticipated waste material in order to properly identify and categorize the waste material that will be produced. The tailings produced from the flotation circuit, which is the vast majority of the waste generated, will likely be Bevill excluded as discussed earlier.

Radioactive Waste Handling and Storage Permit

If the waste material is considered radioactive, TRER may have to obtain a Radioactive Materials License from TCEQ. This license is required for a variety of reasons such as having an operation that recovers source material that contains uranium, or having an operation that disposes of waste that has naturally occurring low-levels of radioactive material. Naturally Occurring Radioactive Material (NORM) is material that naturally contains one or more radioactive isotopes, called radionuclides. If the waste material generated by the Round Top Project is categorized as containing NORM, proper handling procedures will need to be followed to store the waste. Typically, the NORM is in very low concentrations of a high volume of mining waste material. TCEQ has jurisdiction over the disposal of most NORM wastes, but the Texas Department of State Health Services may also be consulted to address potential concerns to human health.

Industrial Multi-Sector General Permit

The Round Top Project will also be required to obtain coverage for discharging stormwater from the mine site via the TCEQ's Industrial Multi-Sector General Permit (MSGP). The process for obtaining this permit dictates that the company will follow best management practices needed to ensure that any stormwater discharging from the mine site has not come into contact with any industrial or hazardous materials and will not diminish the water quality of the surrounding environment. The arid environmental lends to a simple design of holding precipitation run-off and evaporating it versus having a discharge from a non-point source.

Air Quality - Federal Operating Permit

Because the Round Top Project will be using a variety of equipment that will have fossil fuel, particulate matter, and other regulated emissions at the site, an Air Operating Permit will be required. This permit will not only provide an inventory of the types of equipment to be used, but will ensure that the equipment is operating under Best Available Control Technology (BACT) in order to comply with the protections of the Clean Air Act. TRER will work with TCEQ's Air Protection Division to obtain a Federal Operating Permit (FOP). Air modeling will be required for point sources and fugitive dust emissions generated from the Round Top Project. The model will have to demonstrate compliance with ambient air quality standards.

The air program can be broken into two categories, major and minor source classification. Once a major source determination has been completed, which is based on the total amount of point source emissions, it could drive a Potentially Significant Deterioration (PSD) program. It is likely the project can avoid the PSD approach for the first major operating phase but that should be determined. The PSD process adds a few more steps and action levels to the air quality permitting effort.

Currently, Hudspeth County, Texas meets the national ambient air quality standards for criteria monitored by the EPA. In order to obtain the FOP, TRER will have to monitor the baseline air quality area near the project site and assess the potential impact of project emissions to the area. Several months of data collection may be required.

Petroleum Storage Tank Regulation

The project site will most likely have to provide space to store a variety of fuels at the site for equipment use. The TCEQ has procedural requirements for the storage, handling, and reporting of fuel or other petroleum substances. The Round Top Project will be required to register their fuel storage tanks with the state's Petroleum Storage Tank Registration Program.

Water Rights

As mentioned above, due to the historical aspects of land grant rules and adoption of English law, Texas holds a very old approach to appropriation of surface water rights and ground water rights. Under Texas law, groundwater is a possession right held by the land owner. Water can be freely pumped for private use or sale for any purpose. This simplifies the water rights issue and TRER is actively assessing available water sources and has identified several sources that could be obtained.

Private Wells as Public Systems

There is a possibility that the project may have to follow the state rules that govern Public Water Systems, since the Round Top Project will most likely have to acquire water from a privately owned well to provide water to mine employees. If water is obtained from a private well that does not have sanitary control over their facility, and that water is supplied to at least 25 or more people for longer than six months a year, the system would be considered a Non-Transient Non-Community Water Supply (NTNC). TCEQ has rules and guidance for public water systems to ensure that potable water meets state standards.

20.3 Other Environmental Concerns

Because the Round Top Project will most likely go through a joint federal and state environmental analysis review, a variety of environmental concerns will need to be addressed to prepare the NEPA document. The project's anticipated effects to concerns such as threatened, endangered, or sensitive species of vegetation and wildlife will need to be reviewed. Potential effects to cultural or tribal interests may also be reviewed. Other environmental concerns may include topics like impacts to recreational use, scenery, or sound.

TRER will have to develop baseline data collection programs to support preparation of applications and provide characterization of the environmental conditions at the project site. The collection of baseline data may have to span several seasons to collect natural variability that may occur for specific species or conditions.

The Mine closure and reclamation capital for the project has not been estimated. A value of $10 million bond has been included at the initiation of the project in the economic analysis as a representative cost. The cost was estimated based on similar environmental liabilities associated with mines of this size and life span.

21 CAPITAL AND OPERATING COSTS

This PEA, including the mine plan, is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves and there is no certainty that the results of this PEA, including this mine plan, will be realized. Mineral resources that are not mineral reserves have no demonstrated economic viability.

Capital and operating costs for both the mine and processing facilities were developed based on factored and built up estimating techniques, benchmarking and conceptual scheduled production/equipment hours where available. These costs and requirements were determined from a variety of sources which include, estimates from vendors, Gustavson's and TRER's personnel' experience and cost estimates, InfoMine USA Mine and Mill Equipment Cost Estimators Guide. The qualified persons have reviewed these costs and concluded they are reasonable for inclusion in this PEA. Capital and operating costs are to be within +/- 50% at a Preliminary Economic Assessment level of accuracy and operating costs are typically within +/- 35 %. Gustavson has included a 25% contingency on all capital costs and 10% contingency on all operating costs.

21.1 Capital Cost Estimate

For this study, the first 20 years of the project were used. Due to the size of the resource, it is assumed that mining will continue past the first 20 years that were analyzed. Total capital costs are US$845million, which includes initial capital costs of US$292.1 million and sustaining capital costs of the 20 year plan of US$552.9 million. The LoM capital costs are presented in Table 21-1 Capital Cost Summary.

Table 21-1 Capital Cost Summary

Description	LoM Capital	Units	Initial Capital	Sustaining Capital
Mine Equipment	$36,161	$(000)	$6,079	$30,082
Mine Development	$13,475	$(000)	$3,475	$10,000
Process Equipment + Development	$603,145	$(000)	$203,145	$400,000
Preproduction Costs	$23,225	$(000)	$20,975	$2,250
Subtotal Capital	**$676,006**	**$(000)**	**$233,674**	**$442,332**
Contingency	$169,001	$(000)	$58,418	$110,583
Total Capital	**$845,007**	**$(000)**	**$292,092**	**$552,915**

21.1.1 Mine Capital Costs

The 20 year mine capital costs are estimated at $45.2 million. Initial mine equipment is estimated at $7.5million. Capital items are 11 yard loaders and 70 ton trucks. Sustaining mine equipment is $37.60 million for the 20 years used in this study. The sustaining equipment is estimated as either major rebuilds or new replacement equipment. A summary of the mine capital costs are shown in Table 21-2 and a list of the initial mining equipment is shown in Table 21-3.

Table 21-2 Mine Equipment Capital Expenditures

Description	LoM Capital	Units	Initial Capital	Sustaining Capital
Production Equip	$29,335	$(000)	$3,402	$25,933
Support & Misc Equip	$6,826	$(000)	$2,677	$4,149
Subtotal Capital	**$36,161**	**$(000)**	**$6,079**	**$30,082**
Contingency	$9,040	$(000)	$1,520	$7,520
Total Mine Equipment Capital	**$45,201**	**$(000)**	**$7,598**	**$37,602**

Table 21-3 Initial Mine Equipment

Model (Cat Equivalent)	Unit	Cost Capital	Units	# of Units	Total Capital
Cat 990H	Wheel loader*	$1,474	$(000)	1	$1,474
Cat 775	Haul Truck*	$1,025	$(000)	1	$1,025
Cat D7	Dozer	$630	$(000)	1	$630
Cat 16M	Motorgrader	$787	$(000)	1	$787
Cat 972K	Wheel Loader	$305	$(000)	1	$305
Sandvik D50KS	Blasthole Drill*	$817	$(000)	1	$817
	Powder Truck	$86	$(000)	1	$86
	Crane	$415	$(000)	1	$415
	Fork Lift	$46	$(000)	1	$46
Cat	Mechanics Trucks	$85	$(000)	1	$85
Ford	Pickups	$39	$(000)	4	$156
	Water Truck	$253	$(000)	1	$253
Total					**$6,079**
	Contingency	25%			$1,520
Grand Total					**$7,598**

***2 trucks, 1 explosive loader, and 1 drill will be purchased when mining commences in year 1.**

21.1.2 Mine Development Capital

The 20 year mine development capital costs are US$16.84 million. This is for development of roads, mine buildings, and mine development. Initial capital is $4.34 million and sustaining capital is $12.5 million. The mine development capital costs include a 25% contingency. The mine development capital costs are presented in Table 21-4 Mine Development Capital Expenditures below.

Table 21-4 Mine Development Capital Expenditures

Description	LoM Capital	Units	Initial Capital	Sustaining Capital
Haul Roads/Site Work	$700	$(000)	$700	$0
Mine Development Stripping	$1,000	$(000)	$1,000	$0
Buildings	$325	$(000)	$325	$0
Electrical	$850	$(000)	$850	$0
Engineering	$600	$(000)	$600	$0
Sustaining Capital	$10,000	$(000)	$0	$10,000
Subtotal Capital	**$13,475**	**$(000)**	**$3,475**	**$10,000**
Contingency	$3,369	$(000)	$869	$2,500
Total Mine Development Capital	**$16,844**	**$(000)**	**$4,344**	**$12,500**

21.1.3 Process Capital Costs

Equipment costs were estimated from experience with similar sized operations and the "InfoMine Mining Cost Service" estimating guide. Heap leach pad capital cost per square foot of liner was also extracted from the Mine Cost Service estimating guide.

Other direct costs were factored as shown in Table 21-5. These factors have been shown by experience to be valid for this level of cost estimate. Indirect costs were estimated by a 25% factor based on all direct costs. Contingency was estimated as 25% of Total Constructed Costs.

The 20 year process capital costs are estimated at $753.9 million. Initial process capital is estimated at $203.1 million. The initial capital is for building of the crushing plant, overland conveyors, initial heap leach facility, and for the processing plant. Sustaining capital is $500 million for the 20 year project. The sustaining capital includes expansion of the leach pad and the irrigation system for the leach pads. The plant capital costs are presented in Table 21-5 Plant Capital Costs below. The process capital costs include a 25% contingency.

Table 21-5 Process Plant Capital Expenditures

Description		LoM Capital	Units	Initial Capital	Sustaining Capital
Crushing Circuit		$10,859	$(000)	$10,859	$0
Conveying and Stacking		$9,440	$(000)	$9,440	$0
Heap Leach & Ponds		$374,500	$(000)	$34,500	$340,000
Solution Management		$67,000	$(000)	$7,000	$60,000
Tusaar Process Plant		$10,000	$(000)	$10,000	$0
Conventional Treatment		$5,258	$(000)	$5,258	$0
Water Treatment		$3,000	$(000)	$3,000	$0
Subtotal Physical Plant Costs			**$(000)**	**$80,057**	
Installation Costs	***43%***	$34,425	$(000)	$34,425	$0
Piping	***15%***	$12,009	$(000)	$12,009	$0
Instrumentation	***5%***	$4,003	$(000)	$4,003	$0
Building & Site Development	***25%***	$20,014	$(000)	$20,014	$0
Auxiliary, Electric & Utilities	***10%***	$8,006	$(000)	$8,006	$0
Outside Lines	***5%***	$4,003	$(000)	$4,003	$0
Total Direct Costs			**$(000)**	**$162,516**	
Engineering and Indirects	***25%***	$40,629	$(000)	$40,629	$0
Subtotal Process Plant		**$603,145**	**$(000)**	**$203,145**	**$400,000**
Contingency	***25%***	$150,786	$(000)	$50,786	$100,000
Total Process Plant		**$753,931**	**$(000)**	**$253,931**	**$500,000**

21.1.4 Preproduction Capital Costs

20 year owner costs are $29 million. These costs include a $10 million reclamation bond. The preproduction capital costs include a 25% contingency and are presented in Table 21-6 Preproduction Capital Expenditures below.

Table 21-6 Preproduction Capital Expenditures

Description	LoM Capital	Units	Initial Capital	Sustaining Capital
Corporate Services	$2,250	$(000)	$1,500	$750
POO, Environmental	$5,000	$(000)	$5,000	$0
Reclamation Cash Bond	$10,000	$(000)	$10,000	$0
Drill Program	$0	$(000)	$0	$0
PEA/PFS/FS	$3,500	$(000)	$3,500	$0
Community Relations	$200	$(000)	$200	$0
Legal Fees, Permits	$550	$(000)	$550	$0
Employee Training	$225	$(000)	$225	$0
Plant Spares	$1,250	$(000)	$0	$1,250
Mining Spares	$250	$(000)	$0	$250
Subtotal Capital	**$23,225**	**$(000)**	**$20,975**	**$2,250**
Contingency	$5,806	$(000)	$5,244	$563
Total Preproduction Capital	**$29,031**	**$(000)**	**$26,219**	**$2,813**

21.2 Basis of Estimate

Initial capital costs for the Round Top Project PEA were estimated based on the following:

- Crushing, grinding, screening, and leaching estimates based on factored estimated for actual costs from similar size gold and copper leaching facilities.
- Infrastructure estimated from experience with similar sized operations and the "InfoMine Mining Cost Service" estimating guide.
- The hydromet/separation plant was estimated based on conventional rare earth processing technology and was benchmarked to current published preliminary economic assessments and pre-feasibility study estimates.
- Equipment costs were estimated from experience with similar sized operations and the "InfoMine Mining Cost Service" estimating guide. Heap leach pad capital cost per square foot of liner was also extracted from the Mine Cost Service estimating guide.
- Other direct costs were factored. These factors have been shown by experience to be valid for this level of cost estimate. Indirect costs were estimated by a 25% factor based on all direct costs. Contingency was estimated as 25% of Total Constructed Costs.
- Various aspects of the Round Top Project were estimated based on published information by InfoMine USA, November 2013 Electronic Edition.

21.3 Operating Cost Estimate

21.3.1 Project Cost and Basis

Operating costs were developed based on benchmarking and conceptual scheduled production/equipment hours where available. These costs and requirements were determined from a variety of sources which include, estimates from vendors, Gustavson's and TRER's personnel' experience and cost estimates, InfoMine USA Mine and Mill Equipment Cost Estimators Guide. The qualified person has reviewed these costs and concluded they are reasonable for inclusion in this PEA.

The operating cost estimate for the Heap Leach and other processing facilities were based primarily on experience with previous estimates for facilities of similar size and complexity. The accuracy of the component costs are within the separate benchmarked operating costs, manpower requirements, power and reagent costs listed in the various applicable sections of the Mine Cost Service estimating guide.

Project operating costs an average $15.16/t-processed. Gustavson estimated the mining costs based on the 20,000 TPD mine plan discussed in Section 16. Operating costs for the project include labor, power, fuel, maintenance, supplies, parts, and material. A 10% contingency was included in the operating costs of the project. The Project operating cost summary is presented in Table 21-7 Operating Expenditures Summary.

Table 21-7 Operating Expenditures Summary

Description	LoM ($000)	Units	$/Tonne RoM
Mining Operating Costs			
Production	$204,417	$(000)	$1.40
Mine G&A	$73,589	$(000)	$0.50
Subtotal Mine	**$278,006**	**$(000)**	**$1.90**
Contingency	$27,801	$(000)	$0.19
Total Mine	**$305,806**	**$(000)**	**$2.09**
Process Operating Costs			
Operating Supplies	$255,500	$(000)	$1.75
Electric Power	$401,500	$(000)	$2.75
Subtotal Process	**$1,684,840**	**$(000)**	**$11.54**
Contingency	$168,484	$(000)	$1.15
Total Process	**$1,853,324**	**$(000)**	**$12.69**
G&A Operating Costs			
Operating Supplies	$12,810	$(000)	$0.09
Equip, Envir, Utility, Lab, Other	$9,135	$(000)	$0.06
Personnel	$27,648	$(000)	$0.19
Subtotal G&A	**$49,593**	**$(000)**	**$0.34**
Contingency	$4,959	$(000)	$0.03
Total G&A	**$54,552**	**$(000)**	**$0.37**
Total Operating Expenditures	**$2,213,683**	**$(000)**	**$15.16**

21.3.2 Project Manpower

Personnel requirements and wages were estimated based on bench marks with similar sized Gold and Copper concentrators. It was estimated direct TRER staff will be between 125 and 175 personnel.

The processing plant and mining operations will operate 24 hours per day with three-8 hour shifts.

21.3.3 Mine Operating Costs

The LoM project mining costs average $1.90/t-RoM. Table 21-8 Mining Operating Expenditures presents functional costs.

Table 21-8 Mine Operating Expenditures

Description	LoM ($000)	Units	$Tonne RoM
Production			
Drilling & Blasting	$121,832	$(000)	$0.83
Loading & Hauling	$82,585	$(000)	$0.57
Total Production	**$204,417**	**$(000)**	**$1.40**
G&A			
Mine Support	$53,097	$(000)	$0.36
Mine Administrative	$20,491	$(000)	$0.14
Total G&A	**$73,589**	**$(000)**	**$0.50**
Total Mine Operating Expenditures	**$278,006**	**$(000)**	**$1.90**

The mine operating costs are based on the Mine Operating Schedule shown in table 21-9 and the Mining Productivities shown in table 21-10.

Table 21-9 Mine Operating Schedules

Description	Value	Units
Surface Mine		
Max Daily RoM Production	20,000	Tonnes/day
Max Annual RoM Production	7,300	ktonnes/yr
Total RoM Production	146,000	ktonnes
Max Daily Material + Waste Prod	24,842	stpd
Max Annual Material + Waste Prod	9,067	ktonnes/yr
Total Material + Waste Production	159,001	ktonnes
Operating Days per year	365	d/yr
Operating Shifts per Day	3	sh/d
Operating Hours per Shift	8	hr/sh
Operating Efficiency	83.3	%
Mechanical Efficiency	85.0	%

Table 21-10 Mining Productivities

Description	Basis	Units	Production Mining
Drill	per ea drill	tonne/hr	1,400.0
Blast	per ea expl ldr	tonne/hr	1,400.0
Load	per ea loader	tonne/hr	950.0
Haul	per ea truck	tonne/hr	400.0

Mine operating costs are estimated by Gustavson. The mining cost is derived from the required equipment production hours, based on mining productivities and annual mine tonnages.

Mine salaried and hourly labor staffing is presented in Table 21-11 Mining Salary Labor Rates.

Table 21-11 Mine Labor Rates

Description	Personnel	Base Rate 2000 hr/yr	Units	Benefits	Overtime + Shift Diff	Annual Wage ($/yr)	Total Wage ($000/yr)
Production Hourly	40						$2,732
Maintenance Hourly	20						$1,444
Salary	9						$1,025
Totals	**69**						**$5,200**
Production Hourly							
Production Drill Operator	4	$24.76	$/hr	44%	$2.18	$75,663	$303
Explosives Loader	4	$23.86	$/hr	44%	$2.11	$72,936	$292
Drill Helper	4	$19.39	$/hr	44%	$1.77	$59,392	$238
Loader Operator	4	$23.86	$/hr	44%	$2.11	$72,936	$292
Truck Driver	12	$22.41	$/hr	44%	$2.00	$68,542	$823
Helper	4	$19.39	$/hr	44%	$1.77	$59,392	$238
Production Support	8	$22.41	$/hr	44%	$2.00	$68,542	$548
Production Totals	**32**						**$2,732**
Maintenance Hourly							
Mechanic	4	$25.50	$/hr	44%	$2.23	$77,905	$312
Electrician	4	$28.29	$/hr	44%	$2.44	$86,359	$345
Mechanic Helper	4	$19.39	$/hr	44%	$1.77	$59,392	$238
Welder	4	$25.50	$/hr	44%	$2.23	$77,905	$312
Misc.	4	$19.39	$/hr	44%	$1.77	$59,392	$238
Maintenance Totals	**20**						**$1,444**
Salary							
Mine Superintendent	1	$125,000	$/yr	44%	$0.00	$180,000	$180
Maintenance General Foreman	1	$100,000	$/yr	44%	$0.00	$144,000	$144
Mine Foreman	3	$75,500	$/yr	44%	$0.00	$108,720	$326
Mine Engineer	1	$90,000	$/yr	44%	$0.00	$129,600	$130
Mine Geologist	1	$80,000	$/yr	44%	$0.00	$115,200	$115
Surveyor	1	$50,000	$/yr	44%	$0.00	$72,000	$72
Survey Helper	1	$40,000	$/yr	44%	$0.00	$57,600	$58
Salary Totals	**9**						**$1,025**

21.3.4 Plant Operating Costs

The LoM Project process operating costs average $11.54/t-milled. Table 21-12 Process Operating Costs presents component costs.

Table 21-12 Processing Operating Expenditures (all estimates include labor)

Description	LoM ($000)	Units	$/Tonne RoM
Crushing and Conveying			
Crushing and Conveying	$255,500	$(000)	$1.75
Other	$0	$(000)	$0.00
Total Crushing and Conveying	**$255,500**	**$(000)**	**$1.75**
Leaching			
Leaching	$401,500	$(000)	$2.75
Other	$0	$(000)	$0.00
Total Leaching	**$401,500**	**$(000)**	**$2.75**
Recover Mixed RE Carbonates			
Recover Mixed RE Carbonates	$255,500	$(000)	$1.75
Other	$0	$(000)	$0.00
Total Recover Mixed RE Carbonates	**$255,500**	**$(000)**	**$1.75**
Conversion to Oxides			
Conversion to Oxides	$509,540	$(000)	$3.49
Other	$0	$(000)	$0.00
Total Conversion to Oxides	**$509,540**	**$(000)**	**$3.49**
Water Treatment			
Water Treatment	$80,300	$(000)	$0.55
Other	$0	$(000)	$0.00
Total Water Treatment	**$80,300**	**$(000)**	**$0.55**
Environmental			
Environmental	$36,500	$(000)	$0.25
Other	$0	$(000)	$0.00
Total Environmental	**$36,500**	**$(000)**	**$0.25**
Marketing			
Marketing	$73,000	$(000)	$0.50
Other	$0	$(000)	$0.00
Total Marketing	**$73,000**	**$(000)**	**$0.50**
G & A			
G & A	$73,000	$(000)	$0.50
Other	$0	$(000)	$0.00
Total G&A	**$73,000**	**$(000)**	**$0.50**
Total Process Operating Expenditures	**$1,684,840**	**$(000)**	**$11.54**

Process operating costs were estimated by RDi and are inclusive of all costs including labor and power costs. Processing costs were based on Table 21-13 below Process Operating Schedule.

Table 21-13 Processing Operating Schedule

Description	Value	Units
Leach + Separation		
Max Daily RoM Production	20,000	stpd
Max Annual RoM Production	7,300	ktonnes/yr
Total RoM Production	146,000	ktonnes
Operating Days per year	365	d/yr
Operating Shifts per Day	3	sh/d
Operating Hours per Shift	8	hr/sh
Operating Efficiency	100.0	%
Mechanical Efficiency	90.0	%

21.3.5 General and Administration Costs

General and administrative labor costs include general management, safety, accounting, environmental, purchasing, sales, and plant management, insurance etc. at $0.34 per tonne. These costs are shown below in Table. 21-14 Project G&A Operating Expenditures.

Table 21-14 Project G&A Operating Expenditures

Description	LoM ($000)	Units	$Tonne RoM
Operating Supplies	$12,810	$(000)	$0.09
Equip, Envir, Utility, Lab, Other	$9,135	$(000)	$0.06
Personnel	$27,648	$(000)	$0.19
Total G&A	**$49,593**	**$(000)**	**$0.34**

22 ECONOMIC ANALYSIS

The financial results of this report are based upon work performed by Gustavson. The results are prepared on an annual basis. All costs are in Q4 2013 US constant dollars.

22.1 Model Parameters

The indicative economic model was prepared on an unleveraged, pre-tax basis and the results are presented in this section. Key criteria used in the analysis are discussed in detail throughout this report. Assumptions are summarized in the Table 22-1 below.

Table 22-1 Economic Assumptions

Description	Value	Comments
Project Equity	100%	100% project equity
Working Capital Requirement	20%	% of cash costs
Discount Rate	10.00%	
CapEx - Contingency Total	25.0%	
Mine Equipment	25.0%	
Mine Development	25.0%	
Process Equipment	25.0%	
Preproduction Costs	25.0%	
OpEx - Contingency Total	10%	
Mining	10%	
Process	10%	
G&A	10%	

The mine has sufficient material to operate for well over 20 years. The mine production model parameters are shown in Table 22-2 Mine Production Summary.

Table 22-2 Mine Production Summary

Description	Total	Units	Pre-Production	Production
Waste				
Waste	13,001	ktonnes	0	13,001
Subtotal Waste	13,001	ktonnes	0	13,001
ROM Material				
Material Mined From Pit	146,000	ktonnes	0	146,000
Subtotal Mine Material	146,000	ktonnes	0	146,000
Total Material Movement	**159,001**	**ktonnes**	**0**	**159,001**
RoM Grade Summary				
Yttrium	221.86	ppm	0.000	221.86
Lanthanum	19.83	ppm	0.000	19.83
Cerium	77.82	ppm	0.000	77.82
Praseodymium	10.29	ppm	0.000	10.29
Neodymium	28.32	ppm	0.000	28.32
Samarium	10.28	ppm	0.000	10.28
Europium	0.13	ppm	0.000	0.13
Gadolinium	10.13	ppm	0.000	10.13
Terbium	3.50	ppm	0.000	3.50
Dysprosium	31.13	ppm	0.000	31.13
Holmium	7.92	ppm	0.000	7.92
Erbium	33.11	ppm	0.000	33.11
Thulium	7.16	ppm	0.000	7.16
ytterbium	57.40	ppm	0.000	57.40
Lutetium	9.00	ppm	0.000	9.00
Contained Rare Earth Oxide				
Yttrium	41,133	tonnes	0	41,133
Lanthanum	3,396	tonnes	0	3,396
Cerium	13,308	tonnes	0	13,308
Praseodymium	1,758	tonnes	0	1,758
Neodymium	4,823	tonnes	0	4,823
Samarium	1,741	tonnes	0	1,741
Europium	22	tonnes	0	22
Gadolinium	1,704	tonnes	0	1,704
Terbium	589	tonnes	0	589
Dysprosium	5,216	tonnes	0	5,216
Holmium	1,325	tonnes	0	1,325
Erbium	5,527	tonnes	0	5,527
Thulium	1,193	tonnes	0	1,193
ytterbium	9,543	tonnes	0	9,543
Lutetium	1,495	tonnes	0	1,495

The processing facility will be located approximately 2 miles from the mine. This facility will be dedicated to treating material from the mine. The mill will operate 20 years based on the material removed from the mine. The mill production model parameters are shown in Table 22-3 Process Production Summary

Table 22-3 Process Production Summary

Description		Total	Units
RoM to Leach		146,000	ktonnes
Contained Rare Earth Oxides			
	Yttrium	41,133	tonnes
	Lanthanum	3,396	tonnes
	Cerium	13,308	tonnes
	Praseodymium	1,758	tonnes
	Neodymium	4,823	tonnes
	Samarium	1,741	tonnes
	Europium	22	tonnes
	Gadolinium	1,704	tonnes
	Terbium	589	tonnes
	Dysprosium	5,216	tonnes
	Holmium	1,325	tonnes
	Erbium	5,527	tonnes
	Thulium	1,193	tonnes
	ytterbium	9,543	tonnes
	Lutetium	1,495	tonnes
Metal Recovery			
	Yttrium	80%	-
	Lanthanum	57%	
	Cerium	55%	
	Praseodymium	66%	
	Neodymium	69%	
	Samarium	74%	
	Europium	44%	
	Gadolinium	62%	
	Terbium	76%	
	Dysprosium	76%	
	Holmium	75%	
	Erbium	79%	
	Thulium	68%	
	ytterbium	65%	
	Lutetium	65%	
Payable Rare Earth Oxides			
	Yttrium	32,907	tonnes
	Lanthanum	1,936	tonnes
	Cerium	7,319	tonnes
	Praseodymium	1,160	tonnes
	Neodymium	3,328	tonnes
	Samarium	1,288	tonnes
	Europium	10	tonnes
	Gadolinium	1,057	tonnes
	Terbium	448	tonnes
	Dysprosium	3,964	tonnes
	Holmium	993	tonnes
	Erbium	4,366	tonnes
	Thulium	812	tonnes
	ytterbium	6,203	tonnes
	Lutetium	972	tonnes

It is assumed that the final rare earth oxide will be a saleable product and therefore will not be sent to a smelter for further refining. All oxides are to be sold at the plant and will not incur additional shipping charges.

22.2 Project Economics

The indicative economic analysis results are shown in Table 22-4 Economic Analysis Summary. The analysis is based on August 2013 spot prices for the rare earth metals produced at the Round Top Project. The analysis indicates a NPV $_{10\%}$ of US$1.43 billion (pre-tax) with an IRR of 67%. With a positive initial cash flow in Year 1, payback will be in 1.5 years. The following provides the basis for the Gustavson LoM plan and economics:

- Initial Mine life of 20 years
- LoM mill recoveries vary by metal and shown in Table 22-3;
- Operating costs $15.16/t-RoM;
- Capital costs of $845 million, with initial capital costs of $292.2 million and sustaining capital over the LoM of $552.9 million;
- Initial reclamation bond of S10.0 million (incl. in initial capital); and
- No salvage value provisions at end of life (EOL).

Table 22-4 Indicative Economic Model Results

Description	Units	Value	Comments
Production			
RoM to Mill	ktonnes	146,000	
Yttrium Oxide Contained	tonnes	41,133	
Yttrium Oxide Recovered	tonnes	32,907	
Lanthanum Oxide Contained	tonnes	3,396	
Lanthanum Oxide Recovered	tonnes	1,936	
Cerium Oxide Contained	tonnes	13,308	
Cerium Oxide Recovered	tonnes	7,319	
Praseodymium Oxide Contained	tonnes	1,758	
Praseodymium Oxide Recovered	tonnes	1,160	
Neodymium Oxide Contained	tonnes	4,823	
Neodymium Oxide Recovered	tonnes	3,328	
Samarium Oxide Contained	tonnes	1,741	
Samarium Oxide Recovered	tonnes	1,288	
Europium Oxide Contained	tonnes	22	
Europium Oxide Recovered	tonnes	10	
Gadolinium Oxide Contained	tonnes	1,704	
Gadolinium Oxide Recovered	tonnes	1,057	
Terbium Oxide Contained	tonnes	589	
Terbium Oxide Recovered	tonnes	448	
Dysprosium Oxide Contained	tonnes	5,216	
Dysprosium Oxide Recovered	tonnes	3,964	
Holmium Oxide Contained	tonnes	1,325	
Holmium Oxide Recovered	tonnes	993	
Erbium Oxide Contained	tonnes	5,527	
Erbium Oxide Recovered	tonnes	4,366	
Thulium Oxide Contained	tonnes	1,193	
Thulium Oxide Recovered	tonnes	812	
Ytterbium Oxide Contained	tonnes	9,543	
Ytterbium Oxide Recovered	tonnes	6,203	
Lutetium Oxide Contained	tonnes	1,495	
Lutetium Oxide Recovered	tonnes	972	
Estimate of Cash Flow			
Yttrium Market Price	$/kg	$22	
Lanthanum Market Price	$/kg	$3	
Cerium Market Price	$/kg	$4	
Praseodymium Market Price	$/kg	$58	
Neodymium Market Price	$/kg	$40	
Samarium Market Price	$/kg	$5	
Europium Market Price	$/kg	$540	
Gadolinium Market Price	$/kg	$24	
Terbium Market Price	$/kg	$930	
Dysprosium Market Price	$/kg	$528	
Holmium Market Price	$/kg	$350	
Erbium Market Price	$/kg	$125	
Thulium Market Price	$/kg	$1,025	
Ytterbium Market Price	$/kg	$190	
Lutetium Market Price	$/kg	$1,400	
Gross Revenue	**$(000)**	**$7,764,424**	

Description	Units	Value	Comments
Refining & Transport	$(000)	$0	
Royalty	**$(000)**	**$7,764,424**	
Texas State Royalty	$(000)	($487,476)	
Gross Income	**$(000)**	**$7,276,947**	
Operating Costs			
Mining	$(000)	$278,006	
Process	$(000)	$1,684,840	
G&A	$(000)	$49,593	
Subtotal Operating Costs	**$(000)**	**$2,012,439**	
Contingency	$(000)	$201,244	
Total Operating Costs	**$(000)**	**$2,213,683**	
Operating Margin	**$(000)**	**$5,063,264**	
Capital			
Mine Equipment	$(000)	$36,161	
Mine Development	$(000)	$13,475	
Process Equipment	$(000)	$603,145	
Preproduction Costs	$(000)	$23,225	
Subtotal Capital	**$(000)**	**$676,006**	
Contingency	$(000)	$169,001	
Total Capital	**$(000)**	**$845,007**	
Income Tax	$(000)	$0	Pretax Model
Interest Expense	$(000)	$0	100% Equity Model
Cash Flow	**$(000)**	**$4,218,257**	
Present Value	10%	**$1,425,530**	
IRR	%	67%	
Payback	Years	1.5	

22.2.1 Business Factors

No research has been conducted to date on the local labor markets. Through observation it is apparent that a significant proportion of the staff to manage and operate the mine will be imported from El Paso, Arizona and New Mexico.

The above market research indicates that demand for critical rare earth elements will be available when Round Top production commences in 2018.

22.3 Contracts

The qualified person does not know of any contracts or agreements that TRER has that would adversely affect any information presented in this study.

22.4 Sale Price(s)

The economic analysis uses the prices discussed in in Section 19-6 of this PEA. It should be noted that lanthanum, cerium, praseodymium, samarium, gadolinium and terbium are being priced as carbonates as opposed to oxides and thus are discounted by 50%.

Table 22-5 Economic Analysis Prices

Rare Earth Metal Pricing ($/Kg)				
Element	**Metal Pages Price Sept. 2013**	**HEFA Direct Quote Nov. 2013**	**Discount Factor**	**Price Used in Economic Model**
Y	$ 22.00			$ 22.00
La	$ 6.00		50%	$ 3.00
Ce	$ 7.00		50%	$ 3.50
Pr	$ 115.00		50%	$ 57.50
Nd	$ 80.00		50%	$ 40.00
Sm	$ 9.00		50%	$ 4.50
Eu	$ 1,080.00		50%	$ 540.00
Gd	$ 47.00		50%	$ 23.50
Tb	$ 930.00			$ 930.00
Dy	$ 528.00			$ 528.00
Ho		$ 350.00		$ 350.00
Er		$ 125.00		$ 125.00
Tm		$ 1,025.00		$ 1,025.00
Yb		$ 190.00		$ 190.00
Lu		$ 1,400.00		$ 1,400.00

22.5 Royalties

For this study Round Top will pay 1 6.25% royalty on total revenue.

22.6 Sensitivity Analysis

Sensitivity analysis was performed on the capital costs, operating costs, and revenue. Sensitivities were conducted on the above three criteria in 5% increments up to +/- 25%. Figures 22-1 and 22-2 below shows the results of this study affect the NPV the IRR. Table 22-6 summarizes the sensitivity studies.

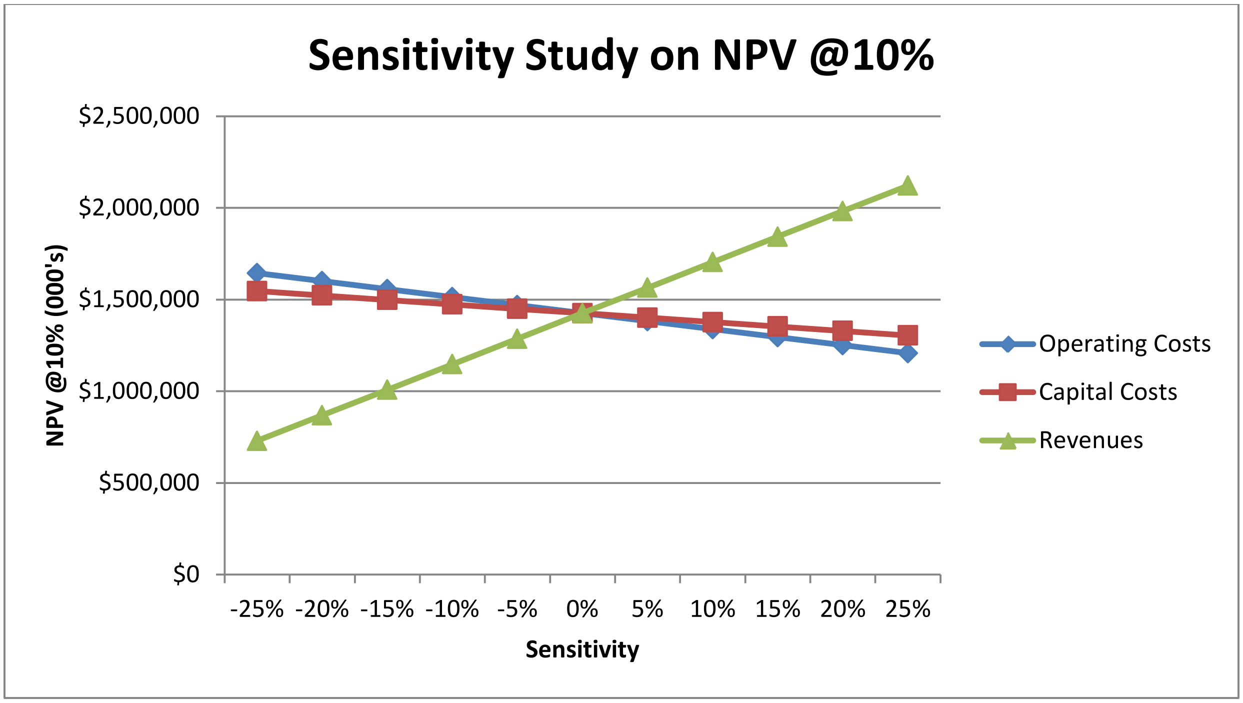

Figure 22-1 Sensitivity on NPV

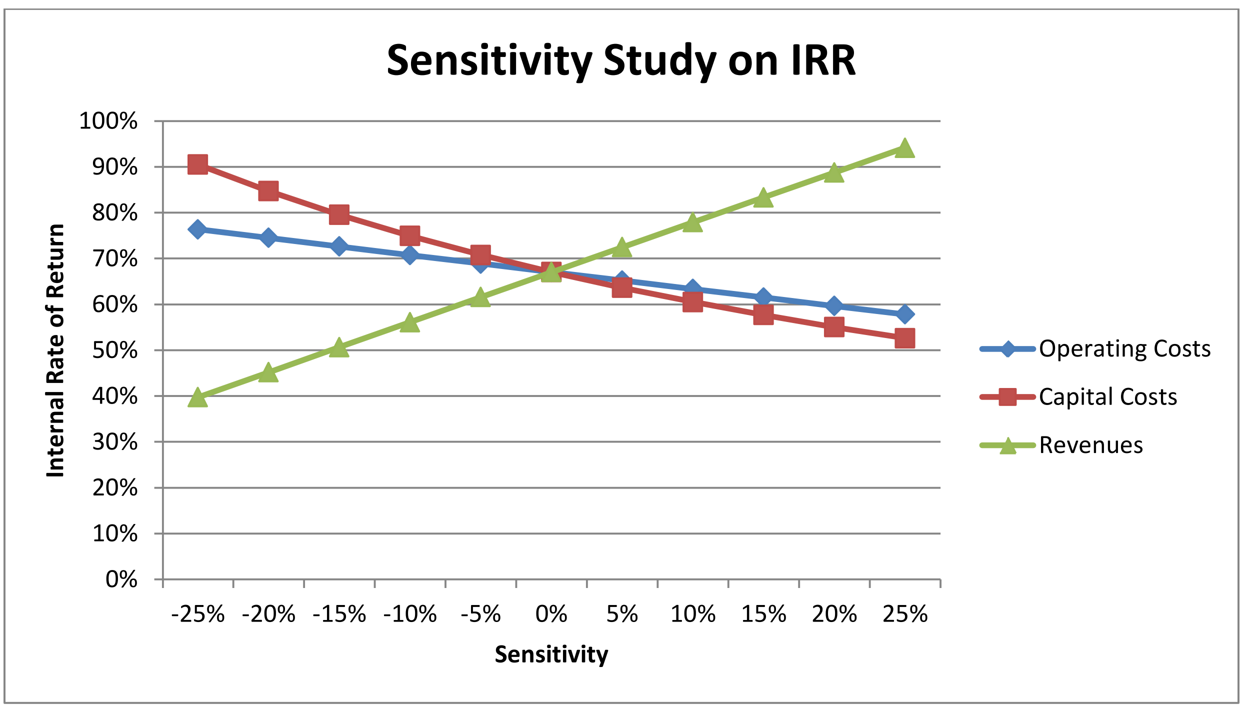

Figure 22-2 Sensitivity on IRR

Table 22-6 Sensitivity Summary

	-25%	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%	25%
NPV Sensitivities											
Capital	$1,546,375	$1,522,206	$1,498,037	$1,473,868	$1,449,699	$1,425,530	$1,401,361	$1,377,192	$1,353,023	$1,328,855	$1,304,686
Operating	$1,643,587	$1,599,975	$1,556,364	$1,512,753	$1,469,142	$1,425,530	$1,381,919	$1,338,308	$1,294,697	$1,251,086	$1,207,474
Revenue	$729,747	$868,904	$1,008,060	$1,147,217	$1,286,374	$1,425,530	$1,564,687	$1,703,844	$1,843,001	$1,982,157	$2,121,314
IRR Sensitivities											
Captial	90%	85%	80%	75%	71%	67%	64%	61%	58%	55%	53%
Operating	76%	75%	73%	71%	69%	67%	65%	63%	61%	60%	58%
Revenue	40%	45%	51%	56%	62%	67%	72%	78%	83%	89%	94%

As can be seen from the figures and table above, the Round Top project is most sensitive to the price of metals. A breakeven analysis was performed on the price of metals, and the price of metals would need to drop by 52% to have $0 present value at a 10% NPV.

23 ADJACENT PROPERTIES

At the time of this report, and to the qualified persons' knowledge, there are no known adjacent properties that host REE deposits.

24 OTHER RELEVANT DATA AND INFORMATION

To the qualified persons' knowledge, there is no other relevant data or information that is not already disclosed in this PEA.

25 INTERPRETATIONS AND CONCLUSIONS

The Round Top Project is an Eocene-aged peralkaline rhyolite-hosted REE deposit with a high ratio of HREEs to LREEs. The rhyolite body is a mushroom-shaped laccolith, slightly elongated northwest-southeast and dipping gently to the southwest.

The REEs are primarily contained in the minerals yttrofluorite and bastnaesite, which are very fine-grained and disseminated throughout the rhyolite mainly in microfractures, voids and coatings on predominantly alkali feldspar phenocrysts. There are different levels of alteration within the rhyolite, although analysis shows that the REE grades do not vary significantly with the rhyolite color or alteration. However, the recoveries or the strength and amount of solution required may vary with rhyolite type.

A preliminary resource model suggests the deposit contains an estimated indicated and measured resource of 480 million metric tons of rock containing 304 million kilograms of REO; and inferred resource of 342 million metric tons of rock containing 216 million kilograms of REOs. A detailed breakdown is shown in Table 14-7.

Side hill open pit mining methods are proposed with on-site processing facilities employing multiple solvent extraction and precipitation methods. Based on preliminary testwork completed to date, process recovery in excess of 70% REE is anticipated.

A preliminary mine plan suggests that part of the resource, containing an estimated 121.6 million metric tons of material, contains 77 million kilograms of REO classified as measured and indicated resource, and another 26 million metric tons of material contains 17 million kilograms of REOs classified as inferred resource. Details are contained in Table 16-1.

The PEA assumes a processing rate of 20,000 metric tons of rhyolite per day or 7.3 million tons per year and analyzes the first 20 years of the mine life. The Base Case NPV at a 10% discount rate is estimated to be $1.4 billion. The life-of- mine capital costs are projected to be $845 million. Life of mine total cash flow is projected at $4.3 billion dollars. Details are contained in Table 22-4.

It is the qualified persons' opinion that the resource model described in this report is suitable for preliminary economic evaluation, and assessment of the potential project viability for determination of advancement of the Project. The PEA results justify advancing the Project to a feasibility study.

This PEA, including the mine plan, is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. No mineral resources defined in this PEA have been converted to reserves. Mineral resources that are not mineral reserves have no demonstrated economic viability. There is no certainty that the results of this PEA, including the mine plan, will be realized.

Principle risks to developing Round Top include the price and demand for REOs. Although the Round Top deposit is a low grade deposit, it is relatively insensitive to both operating and capital costs.

It will be necessary for TRER to enter into memorandum of understanding (MOU) or letter of intent (LOI) agreements with intended end users prior to advancing beyond feasibility. The major focus of the MOU/LOI's will be toward the sale of potential CREEs that will be in demand past 2015. Although the Roskill market study shows a solid projected demand accompanying the increasing use of electronics, securing these agreements in advance will provide a measure of protection to the Project revenue.

26 RECOMMENDATIONS

The qualified persons' recommend:

- Geotechnical and hydrological drilling and study of the proposed leach area and processing plant.
- Proceeding through to the feasibility stage, at a cost of $13.4 million as outlined below in Section 26.4.
- Conversion of resources to reserves

The recommendations below are to advance the Round Top Project, through the completion of a feasibility study.

26.1 Geotechnical Exploration

A full geotechnical and hydrological study should be completed for the Round Top Project. Condemnation holes should be drilled and test pits excavated in the areas for the proposed facility and leach site

26.2 Environmental Studies and Mine Planning

As stated in Section 20, monitoring as part of an environmental baseline study may require monitoring over several months or season in order to collect representative data. As such, it is recommended that a scope of an environmental baseline study should be determined followed by monitoring.

One anticipated infrastructure challenge is the size of the on-site leach facility. The facility is designed to be on land for which an option to purchase from the State is being negotiated by TRER. A detailed design of the leach facility should be conducted to better identify the engineering and geotechnical requirements.

26.3 Metallurgical Studies

The feasibility of the Project will depend, on confirmation that TRE can leach the REEs by implementing the heap leach process, evaluate the viability of the Tusaar technology to separate Al, Fe, U, and Th and concentrate REE's and test process for separating REE's using Chinese conventional technology.

The metallurgical test work can be undertaken in two phases:

Phase I: Open-circuit column tests to confirm leach recovery and produce pregnant solution for evaluation of Tusaar technology.

Phase II: Open and locked cycle column tests including Tusaar process to generate design data and production of combined REE powder for testing of separation technology. Evaluate separation process and generate data for plant design.

26.4 Feasibility Study

The above recommended work should culminate in the completion of a feasibility study. The qualified persons' recommend continuing development and exploration work, including completing 50 development, proceeding through to completion of a feasibility study at a cost of $13.4 million as outlined below. A pilot plant is included in the metallurgical budget. The budget is presented in below.

Table 26-1 Proposed Budget through Feasibility Stage

Task	Budget
Geo Technical Studies	$400,000
Environmental Studies	$2,000,000
Metallurgy	$2,500,000
Heap Leach Contractor Design	$400,000
Ground Water Wells / Hydrology	$500,000
Power Evaluation / Power Line Upgrade	$1,500,000
Feasibility Studies	$1,200,000
Subtotal	$8,500,000
Project personnel	$1,450,000
General and Administrative (project only)	$800,000
Subtotal	$10,750,000
Contingency 25%	$2,687,500
Total (with contingency)	**$13,437,500**

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28 CERTIFICATE OF AUTHOR FORMS

DONALD E. HULSE

Principal Mining Engineer

Gustavson Associates, LLC
274 Union Boulevard, Suite 450
Lakewood, Colorado USA 80228
Telephone: 720-407-4062 Facsimile: 720-407-4067
Email: dhulse@gustavson.com

CERTIFICATE of AUTHOR

I, Donald E. Hulse do hereby certify that:

1. I am currently employed as Principal Mining Engineer by Gustavson Associates, LLC at:

   274 Union Boulevard
   Suite 450
   Lakewood, Colorado 80228

2. I am a graduate of the Colorado School of Mines with a Bachelor of Science in Mining Engineering (1982), and have practiced my profession continuously since 1983.
3. I am a registered Professional Engineer, in good standing in the State of Colorado (35269), and a registered member in good standing of the Society of Mining Metallurgy & Exploration (1533190RM).
4. I have worked as a mining engineer for a total of 29 years since my graduation from university; as an employee of a major mining company, a major engineering company, and as a consulting engineer. I have estimated mineral resources in precious metals, base metals, and industrial minerals in a variety of geologic settings. I have planned and operated surface mines in the US, Chile and Mexico, including cost estimation, cutoff grade determination, and equipment productivities.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 Standard of Disclosure for Mineral Projects ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of the technical report titled "Amended NI 43-101 Preliminary Economic Assessment on the Round Top Project Sierra Blanca, Texas" dated April 28, 2014 with an effective date of November 30, 2013 (the "**PEA**"). I am specifically responsible for Sections 1 through 6, 15, 16, and 18 through 27. I conducted a site visit on September 18, 2013 for one day.

7. I have had prior involvement with the property that is the subject of the PEA. I was responsible for the preparation of the technical report titled "NI 43-101 Preliminary Economic Assessment on the Round Top Project Sierra Blanca, Texas" dated June 22, 2012 with an effective date of May 15, 2012. I was specifically responsible for Sections 1 through 6, 15, 16, and 18 through 27.
8. I am independent of Texas Rare Earth Resources Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have read National Instrument 43-101 and Form 43-101, and the PEA has been prepared in compliance with that instrument and form.
10. As of the effective date of this PEA, to the best of my knowledge, information and belief, the PEA contains all scientific and technical information that is required to be disclosed to make the PEA not misleading.

Dated this 28th day of April, 2014.

/s/ Donald E. Hulse
Signature of Qualified Person

Donald E. Hulse
Print name of Qualified Person

M. Claiborne Newton, III, Ph.D., SME-RM

Chief Geologist

Gustavson Associates, LLC
274 Union Boulevard, Suite 450
Lakewood, Colorado USA 80228
Telephone: 720-407-4062 Facsimile: 720-407-4067
Email: cnewton@gustavson.com

CERTIFICATE of AUTHOR

I, M. Claiborne Newton, III, do hereby certify that:

1. I am currently employed as Chief Geologist by Gustavson Associates, LLC at:

   274 Union Boulevard
   Suite 450
   Lakewood, Colorado 80228

2. I am a graduate of North Carolina State University with a Bachelor of Arts in Geology (1977), a Master of Science degree in Geological Sciences (1983) from Virginia Polytechnic Institute and State University and a Doctor of Philosophy degree in Geosciences (1990) from the University of Arizona. I have practiced my profession continuously since 1977.
3. I am a Registered Member in good standing of the Society for Mining, Metallurgy and Exploration (#4145342RM) and a Qualified Professional Member in good standing of the Mining and Metallurgical Society of America (#01396QP) with recognized special expertise in geology, mining, and ore reserves. I am a registered Professional Geologist in the State of Virginia (#2801001736), and I am a member of the Society of Economic Geologists.
4. I have worked as a geologist for a total of 35 years since graduation from university - as an employee of three major mining companies and two major engineering and geological consulting firms, as a consulting geologist and as a university instructor. I have many years of field and laboratory experience with igneous and metamorphic rocks containing rare earth and other incompatible element concentrations.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects ("**NI 43-101**") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the preparation of the technical report titled "Amended NI 43-101 Preliminary Economic Assessment on the Round Top Project Sierra Blanca, Texas" dated April 28, 2014 with an effective date of November 30, 2013 (the "**PEA**"). I am specifically responsible for Sections 7 through 12 and Section 14. I conducted a site visit for eight days May 11-18, 2012.
7. I have had prior involvement with the Round Top property that is the subject of the PEA. I was responsible for the Sections 7 through 12 of the report entitled "NI 43-101 Preliminary Economic Assessment, Round Top Project, Sierra Blanca, Texas", dated June 22, 2012 with an effective date of May 15, 2012. I was also responsible for the report entitled "Resource Estimate and Statistical Summary, Round Top Project, Sierra Blanca, Texas," dated September 30, 2013 with an effective date of January 20, 2013.
8. I am independent of Texas Rare Earth Resources Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have read NI 43-101 and Form 43-101, and the PEA has been prepared in compliance with that instrument and form.
10. As of the effective date of this PEA, to the best of my knowledge, information and belief, the PEA contains all scientific and technical information that is required to be disclosed to make the PEA not misleading.

Dated this 28th day of April, 2014.

/s/ M. Claiborne Newton
Signature of Qualified Person

M. Claiborne Newton, III, PhD
Print name of Qualified Person

Deepak Malhotra, Ph.D.

President

Resource Development, Inc. (RDi)
11475 W. I-70 Frontage Road North
Wheat Ridge, CO USA 80033
Telephone: 303-422-1176 Facsimile: 303-424-8580
Email: dmalhotra@aol.com

CERTIFICATE of AUTHOR

I, Deepak Malhotra, PhD do hereby certify that:

1. I am President of:

   Resource Development, Inc. (RDi)
   11475 W. I-70 Frontage Road North
   Wheat Ridge, CO, USA, 80033

2. I graduated with a degree in Master of Science from Colorado School of Mines in 1973. In addition, I have obtained a PhD in Mineral Economics from Colorado School of Mines in 1977.

3. I am a registered member of the Society of Mining, Metallurgy and Exploration, Inc. (SME), member No. 2006420RM.

4. I have worked as a mineral processing engineer and mineral economist for a total of 40 years since my graduation from university. I have experience in similar project types inclusive of those in the Western United States.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the preparation of the technical report titled "Amended NI 43-101 Preliminary Economic Assessment on the Round Top Project Sierra Blanca, Texas" dated April 28, 2014 with an effective date of November 30, 2013 (the "**PEA**"). I am specifically responsible for the preparation of Sections 13 and 17. I did not visit the subject property.

7. I have had prior involvement with the Round Top property that is the subject of the PEA. I was responsible for the preparation of Sections 13 and 17 of the Technical Report titled "NI 43-101 Preliminary Economic Assessment of the Round Top Project, Sierra Blanca, Texas," dated June 22, 2012 with an effective date of May 15, 2012 relating to the Round Top Rare Earth Project.

8. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.

9. I have read NI 43-101 and Form 43-101F1, and the PEA has been prepared in compliance with that instrument and form.

10. As of the effective date of this PEA, to the best of my knowledge, information and belief, the PEA contains all scientific and technical information that is required to be disclosed to make the PEA not misleading.

Dated this 28th day of April, 2014.

/s/ *Deepak Malhotra*
Signature of Qualified Person

Deepak Malhotra .
Print name of Qualified Person

Appendix A

Drill Hole Collars

BHID	Depth	_X_Coord	_Y_Coord	_Z_Coord
1	350	689556.8	10466919	5093.22
2	150	690434.7	10467188	5067.04
3	350	688349.7	10466585	4893.23
5	300	689205.3	10466674	5098.07
201	600	688115.3	10463752	4567.38
202	80	691434.3	10467060	5088.24
203	142	691250.7	10467077	5110.53
204	352	691054.8	10467079	5110.35
205	232	690930.7	10466946	5134
206	183	690753.9	10467060	5116.4
207	122	690565.3	10467188	5075.07
208	152	690377	10467150	5065.64
209	203	690320.4	10467025	5069.05
211	250	690265.6	10466800	5074.73
212	110	690185.1	10466998	4999.42
213	195	690143.4	10466894	5010.33
214	210	690023	10466912	5029.07
215	215	689840.7	10466989	5039.89
216	220	689763	10467019	5041.54
217	200	689638.1	10467086	5022.11
218	210	689154	10466910	4984.91
219	220	689363.9	10467014	5007.66
220	140	688955.4	10466931	4923.75
221	160	688692.2	10466879	4904.57
222	220	688535.6	10466762	4888.95
223	140	688780.4	10466924	4900.21
224	160	688865.8	10466957	4902.99
226	216	688572.3	10466938	4864.42
227	180	690302.7	10467149	5042.54
228	300	689237	10466692	5106.23
229	360	689400.2	10466812	5119.93
230	360	689790.1	10466813	5132.26
231	320	690345.6	10466652	5138.12
232	280	690135.6	10466653	5130.85
233	360	690458.5	10466825	5175.1
234	280	690514.8	10467007	5138.84
235	380	690894.4	10466713	5240.96
236	320	691049.7	10466833	5205.35
237	260	691415.3	10466882	5199.33
238	300	690726.1	10466905	5191.83
239	360	689043.7	10466616	5104.21

BHID	Depth	_X_Coord	_Y_Coord	_Z_Coord
240	360	688331	10466574	4891.64
241	410	688193.7	10466439	4885.5
242	580	688508.6	10466331	5055.41
243	445	688689.9	10466457	5062.45
244	312.5	688814.5	10466591	5066.77
245	290	689410	10466881	5092.51
246	385	689617.2	10466908	5100.82
247	165	688354.8	10467049	4786.98
248	205	688322.4	10466865	4779.02
249	165	688140.8	10466763	4766.31
250	205	688008.5	10466628	4767.6
251	325	687933.7	10466413	4763.28
252	345	687875.8	10466248	4756.22
253	445	688474.9	10466463	4984.46
254	400	688638.1	10466626	4975.5
255	265	688786.1	10466752	4978.14
256	285	688971.7	10466801	4988.28
259	465	688409.5	10466517	4943.26
260	365	688486.2	10466545	4949.79
261	305	688439.6	10466646	4891.21
262	305	688045.2	10466706	4758.95
263	165	688251.9	10466792	4779.71
264	245	688115.3	10466585	4813.36
265	245	688205.2	10466653	4823.72
266	205	688293	10466699	4829.53
267	180	688374.1	10466744	4828.03
268	405	689146.5	10466618	5106.93
269	525	688616.6	10466395	5062.39
270	190	690491.1	10467128	5089.69
271	280	690380.5	10466931	5113.44
280	405	689166.9	10466503	5187.8
281	395	689258.5	10466552	5172.47
282	265	692975.8	10465090	5106.57
283	265	692795.6	10465183	5104.61
284	265	692928.2	10464891	5131.52
285	285	692995.1	10464727	5107.79
286	265	693125.4	10464559	5109.55
287	305	693105.9	10464351	5122.8
288	125	688102.9	10466850	4729.44
289	100	688031.1	10466826	4724.55
290	60	687947.6	10466825	4707.23

BHID	Depth	_X_Coord	_Y_Coord	_Z_Coord
291	100	687878.8	10466747	4707.6
292	125	688184.9	10466881	4731.64
293	255	688275	10466546	4883.03
294	330	690770.1	10466850	5208.15
295	400	690586.8	10466853	5213.66
296	405	690519.4	10466667	5237.68
308	267.5	688241.7	10466675	4826.57
309	120	689484.4	10467184	4946.34
310	120	689408.7	10467142	4958.91
311	140	689303.7	10467089	4962.73
312	120	689219.1	10467045	4953.08
313	100	689135.2	10466998	4940
314	145	689071.1	10466937	4937.74
315	260	689058.9	10466843	4974.65
316	580	688559.5	10466364	5058.56
317	382.5	689300.5	10466756	5102.69
318	252.5	689063.2	10466712	5038.55
319	400	688965.1	10466710	5034.95
320	320	689128.8	10466716	5043.46
321	260	689220.4	10466828	5039.8
322	240	689300	10466896	5048.32
323	260	689381	10466946	5048.74
324	435	689472.6	10466987	5045.13
325	220	690413.8	10467046	5098.13
336	645	690344.8	10462566	4682.32
337	460	687842	10465480	4652.703
RT 401	260	690385.1	10461090	4524.13
RT 402	240	690532.6	10461475	4554.5
RT 403	570	690587.4	10463216	4798.06
RT 404	560	690346.9	10462580	4684.14
RT 405	410	691697.2	10461555	4587.22
RT 406	415	691546.1	10461176	4551.58
RT 407	385	691113.4	10460798	4514.68
RT 408	385	691122.8	10460574	4502.44
RT 409	375	692055.5	10459215	4500.52
RT 410	400	690725.1	10459944	4475.37
RT 411	435	689835.5	10459936	4463.7
RT 412	480	688718.3	10460541	4450.56
RT 413	400	688528.6	10461265	4468.18
RT 414	400	687764.5	10461245	4435.94
RT 415	520	687491.4	10462244	4439.29

BHID	Depth	_X_Coord	_Y_Coord	_Z_Coord
RT 416	90	687783.5	10462233	4456.33
RT 417	500	687833	10462785	4488.58
RT 418	500	686520.5	10461799	4398.57
RT 419	500	685756	10463023	4376.1
RT 420A	760	688786.4	10464401	4845.13
RT 421	740	689337.9	10464090	4897.85
RT 422	420	687840.7	10465497	4650.22
RT 423	580	687766	10464750	4594.82
RT 424	300	685965.9	10464318	4376.05
RT 425	380	687499.8	10465527	4546.75
RT 426	340	687233.2	10466153	4513.32
RT 427	700	688513	10466735	4886.05
RT 428	370	688149.5	10466390	4879.65
RT 429	300	688322.7	10466583	4884.54
RT 430	115	688838.1	10466975	4891.21
RT 431	50	689532.4	10467220	4935.479
RT 432	95	689330.6	10467105	4962.52
RT 433	75	689112	10466971	4941.84
RT 434	180	688911.1	10466797	4983.19
RT 435	230	688759.5	10466738	4978.95
RT 436	440	688397.3	10466450	4966.49
RT 437	135	689913.4	10466964	5032.04
RT 438	165	690453.1	10467106	5091.35
RT 439	360	690243.5	10466592	5146.38
RT 440	300	689606.8	10466872	5118.9
RT 441	360	689217.1	10466702	5094.43
RT 442	270	688885.3	10466610	5079.88
RT 443	260	688647.9	10466430	5056.86
RT 444	560	688403.3	10466233	5040.34
RT 445	205	691521.2	10466840	5191.83
RT 446	230	691227.2	10466946	5190
RT 447	315	691012.6	10466763	5210
RT 448	230	690690.6	10466949	5177
RT 449	550	688879.7	10466061	5260
RT 450	675	688667.5	10466164	5200
RT 451	440	689482.3	10466629	5240
RT 452A	475	690772.4	10466641	5307.996
RT 452A-60	570	690774	10466640	5308.002
RT 452A-70	495	690773.2	10466641	5308.002
RT 453	600	690655.3	10466300	5360
RT 454	615	690370.3	10466118	5396.066

BHID	Depth	_X_Coord	_Y_Coord	_Z_Coord
RT 455	305	690762.1	10466214	5431.594
RT 456	800	690000.7	10465966	5561.63
RT 457	720	689720.9	10466088	5527.125
RT 458	460	690541.4	10466381	5284.831
RT 459	830	691502.7	10466018	5626.948
RT 460-45	400	689706.9	10466088	5527.125
RT 460-55	300	689708.9	10466088	5527.125
RT 460-80	720	689708.9	10466088	5527.125
RT 461	1180	690985.4	10465416	5722.594
RT 462A	1020	690460.4	10465662	5669.952
RT 463-45	820	689725.9	10466093	5527.125
RT 463-60	530	689726.9	10466095	5527.125
RT 464	780	691195.3	10465733	5688.993
RT 465	1020	691346.6	10465635	5690.727
RT 467	960	690963.9	10465716	5689.12
RT 466-60	470	689715.9	10466093	5527.125
RT 468	260	693110.1	10464356	5121.37
RT 469	855	689871.7	10465613	5440.16
RT 470	765	692090	10464695	5472.707
RT 471	725	691683.4	10465034	5479.47
RT 472	965	691463.2	10465262	5538.16
RT 474	585	691057.5	10463383	4811.02
RT 475	520	689409.1	10462817	4564.02
RT 476	665	690256.1	10463725	4803.42
RT 477	375	692025.8	10463160	4759.11
RT 478	435	692462.5	10462621	4738.25
RT 479	1000	693062.4	10464223	5051.31
RT 480	600	692900.4	10466092	4972.38
RTC 459	279	691507.7	10466013	5626.95
RTC 461	1024.5	690985.4	10465426	5722.59

Appendix B

Drill Hole Survey

BHID	Depth	Bearing (°)	Dip (°)
1	0	0	-90
1	350	0	-90
2	0	0	-90
2	150	0	-90
3	0	0	-90
3	350	0	-90
5	0	0	-90
5	300	0	-90
201	0	0	-90
201	600	0	-90
202	0	0	-90
202	80	0	-90
203	0	0	-90
203	142	0	-90
204	0	0	-90
204	352	0	-90
205	0	0	-90
205	232	0	-90
206	0	0	-90
206	183	0	-90
207	0	0	-90
207	122	0	-90
208	0	0	-90
208	152	0	-90
209	0	0	-90
209	203	0	-90
211	0	0	-90
211	250	0	-90
212	0	0	-90
212	110	0	-90
213	0	0	-90
213	195	0	-90
214	0	0	-90
214	210	0	-90
215	0	0	-90
215	215	0	-90
216	0	0	-90
216	220	0	-90
217	0	0	-90
217	200	0	-90
218	0	0	-90

BHID	Depth	Bearing (°)	Dip (°)
218	210	0	-90
219	0	0	-90
219	220	0	-90
220	0	0	-90
220	140	0	-90
221	0	0	-90
221	160	0	-90
222	0	0	-90
222	220	0	-90
223	0	0	-90
223	140	0	-90
224	0	0	-90
224	160	0	-90
226	0	0	-90
226	216	0	-90
227	0	0	-90
227	180	0	-90
228	0	0	-90
228	300	0	-90
229	0	0	-90
229	360	0	-90
230	0	0	-90
230	360	0	-90
231	0	0	-90
231	320	0	-90
232	0	0	-90
232	280	0	-90
233	0	0	-90
233	360	0	-90
234	0	0	-90
234	280	0	-90
235	0	0	-90
235	380	0	-90
236	0	0	-90
236	320	0	-90
237	0	0	-90
237	260	0	-90
238	0	0	-90
238	300	0	-90
239	0	0	-90
239	360	0	-90

BHID	Depth	Bearing (°)	Dip (°)
240	0	0	-90
240	360	0	-90
241	0	0	-90
241	410	0	-90
242	0	0	-90
242	580	0	-90
243	0	0	-90
243	445	0	-90
244	0	0	-90
244	312.5	0	-90
245	0	0	-90
245	290	0	-90
246	0	0	-90
246	385	0	-90
247	0	0	-90
247	165	0	-90
248	0	0	-90
248	205	0	-90
249	0	0	-90
249	165	0	-90
250	0	0	-90
250	205	0	-90
251	0	0	-90
251	325	0	-90
252	0	0	-90
252	345	0	-90
253	0	0	-90
253	445	0	-90
254	0	0	-90
254	400	0	-90
255	0	0	-90
255	265	0	-90
256	0	0	-90
256	285	0	-90
259	0	0	-90
259	465	0	-90
260	0	0	-90
260	365	0	-90
261	0	0	-90
261	305	0	-90
262	0	0	-90

BHID	Depth	Bearing (°)	Dip (°)
262	305	0	-90
263	0	0	-90
263	165	0	-90
264	0	0	-90
264	245	0	-90
265	0	0	-90
265	245	0	-90
266	0	0	-90
266	205	0	-90
267	0	0	-90
267	180	0	-90
268	0	0	-90
268	405	0	-90
269	0	0	-90
269	525	0	-90
270	0	0	-90
270	190	0	-90
271	0	0	-90
271	280	0	-90
280	0	0	-90
280	405	0	-90
281	0	0	-90
281	395	0	-90
282	0	0	-90
282	265	0	-90
283	0	0	-90
283	265	0	-90
284	0	0	-90
284	265	0	-90
285	0	0	-90
285	285	0	-90
286	0	0	-90
286	265	0	-90
287	0	0	-90
287	305	0	-90
288	0	0	-90
288	125	0	-90
289	0	0	-90
289	100	0	-90
290	0	0	-90
290	60	0	-90

BHID	Depth	Bearing (°)	Dip (°)
291	0	0	-90
291	100	0	-90
292	0	0	-90
292	125	0	-90
293	0	0	-90
293	255	0	-90
294	0	0	-90
294	330	0	-90
295	0	0	-90
295	400	0	-90
296	0	0	-90
296	405	0	-90
308	0	0	-90
308	267.5	0	-90
309	0	0	-90
309	120	0	-90
310	0	0	-90
310	120	0	-90
311	0	0	-90
311	140	0	-90
312	0	0	-90
312	120	0	-90
313	0	0	-90
313	100	0	-90
314	0	0	-90
314	145	0	-90
315	0	0	-90
315	260	0	-90
316	0	0	-90
316	580	0	-90
317	0	0	-90
317	382.5	0	-90
318	0	0	-90
318	252.5	0	-90
319	0	0	-90
319	400	0	-90
320	0	0	-90
320	320	0	-90
321	0	0	-90
321	260	0	-90
322	0	0	-90

BHID	Depth	Bearing (°)	Dip (°)
322	240	0	-90
323	0	0	-90
323	260	0	-90
324	0	0	-90
324	435	0	-90
325	0	0	-90
325	220	0	-90
336	0	0	-90
336	645	0	-90
337	0	0	-90
337	460	0	-90
RT 401	0	0	-90
RT 401	260	0	-90
RT 402	0	0	-90
RT 402	240	0	-90
RT 403	0	0	-90
RT 403	570	0	-90
RT 404	0	0	-90
RT 404	560	0	-90
RT 405	0	0	-90
RT 405	410	0	-90
RT 406	0	0	-90
RT 406	415	0	-90
RT 407	0	0	-90
RT 407	385	0	-90
RT 408	0	0	-90
RT 408	385	0	-90
RT 409	0	0	-90
RT 409	375	0	-90
RT 410	0	0	-90
RT 410	400	0	-90
RT 411	0	0	-90
RT 411	435	0	-90
RT 412	0	0	-90
RT 412	480	0	-90
RT 413	0	0	-90
RT 413	400	0	-90
RT 414	0	0	-90
RT 414	400	0	-90
RT 415	0	0	-90
RT 415	520	0	-90

BHID	Depth	Bearing (°)	Dip (°)
RT 416	0	0	-90
RT 416	90	0	-90
RT 417	0	0	-90
RT 417	500	0	-90
RT 418	0	0	-90
RT 418	500	0	-90
RT 419	0	0	-90
RT 419	500	0	-90
RT 420A	0	0	-90
RT 420A	760	0	-90
RT 421	0	0	-90
RT 421	740	0	-90
RT 422	0	0	-90
RT 422	420	0	-90
RT 423	0	0	-90
RT 423	580	0	-90
RT 424	0	0	-90
RT 424	300	0	-90
RT 425	0	0	-90
RT 425	380	0	-90
RT 426	0	0	-90
RT 426	340	0	-90
RT 427	0	0	-90
RT 427	700	0	-90
RT 428	0	0	-90
RT 428	370	0	-90
RT 429	0	0	-90
RT 429	300	0	-90
RT 430	0	0	-90
RT 430	115	0	-90
RT 431	0	0	-90
RT 431	50	0	-90
RT 432	0	0	-90
RT 432	95	0	-90
RT 433	0	0	-90
RT 433	75	0	-90
RT 434	0	0	-90
RT 434	180	0	-90
RT 435	0	0	-90
RT 435	230	0	-90
RT 436	0	0	-90

BHID	Depth	Bearing (°)	Dip (°)
RT 436	440	0	-90
RT 437	0	0	-90
RT 437	135	0	-90
RT 438	0	0	-90
RT 438	165	0	-90
RT 439	0	0	-90
RT 439	360	0	-90
RT 440	0	0	-90
RT 440	300	0	-90
RT 441	0	0	-90
RT 441	360	0	-90
RT 442	0	0	-90
RT 442	270	0	-90
RT 443	0	0	-90
RT 443	260	0	-90
RT 444	0	0	-90
RT 444	560	0	-90
RT 445	0	0	-90
RT 445	205	0	-90
RT 446	0	0	-90
RT 446	230	0	-90
RT 447	0	0	-90
RT 447	315	0	-90
RT 448	0	0	-90
RT 448	230	0	-90
RT 449	0	0	-90
RT 449	550	0	-90
RT 450	0	0	-90
RT 450	675	0	-90
RT 451	0	0	-90
RT 451	440	0	-90
RT 452A	0	120	-80
RT 452A	475	120	-80
RT 452A-70	0	120	-70
RT 452A-70	495	120	-70
RT 452A-60	0	120	-58.6127
RT 452A-60	10	118.9178	-58.411
RT 452A-60	20	118.8378	-58.2787
RT 452A-60	30	119.1115	-58.1965
RT 452A-60	40	119.4296	-58.1221
RT 452A-60	50	119.6599	-57.9458

BHID	Depth	Bearing (°)	Dip (°)
RT 452A-60	60	119.6811	-57.8697
RT 452A-60	70	119.1545	-57.7335
RT 452A-60	80	118.9387	-58.0232
RT 452A-60	90	118.9684	-58.384
RT 452A-60	100	118.9432	-58.6468
RT 452A-60	110	119.095	-58.8769
RT 452A-60	120	119.1415	-59.3084
RT 452A-60	130	119.1362	-59.9946
RT 452A-60	140	119.8939	-60.675
RT 452A-60	150	120.7436	-61.4136
RT 452A-60	160	121.0386	-61.7414
RT 452A-60	170	120.5664	-61.6856
RT 452A-60	180	120.3531	-61.6624
RT 452A-60	190	120.2953	-61.6783
RT 452A-60	200	120.3896	-61.5453
RT 452A-60	210	119.9926	-60.8156
RT 452A-60	220	119.4	-59.8394
RT 452A-60	230	119.144	-58.8385
RT 452A-60	240	118.759	-58.0445
RT 452A-60	250	118.461	-57.454
RT 452A-60	260	118.0968	-57.0784
RT 452A-60	270	117.7127	-56.6008
RT 452A-60	280	117.7566	-56.0045
RT 452A-60	290	117.7913	-55.2278
RT 452A-60	300	117.5399	-54.3028
RT 452A-60	310	117.6357	-53.3901
RT 452A-60	320	117.9829	-52.423
RT 452A-60	330	118.6897	-51.5651
RT 452A-60	340	119.4269	-50.8921
RT 452A-60	350	119.9238	-50.219
RT 452A-60	360	120.1905	-49.8429
RT 452A-60	370	120.2501	-49.0795
RT 452A-60	380	120.1516	-48.2528
RT 452A-60	390	120.2688	-47.349
RT 452A-60	400	120.4228	-46.7262
RT 452A-60	410	120.7948	-46.2079
RT 452A-60	420	121.2563	-45.8286
RT 452A-60	430	121.5238	-45.3504
RT 452A-60	440	121.9505	-44.9181
RT 452A-60	450	122.2708	-44.3239
RT 452A-60	460	122.3266	-43.5153

BHID	Depth	Bearing (°)	Dip (°)
RT 452A-60	470	122.3198	-43.3114
RT 452A-60	480	122.0719	-43.2934
RT 452A-60	490	121.7972	-43.2949
RT 452A-60	500	121.6478	-42.9831
RT 452A-60	510	121.8895	-42.6085
RT 452A-60	520	122.0108	-42.2093
RT 452A-60	530	122.1145	-41.6699
RT 452A-60	540	121.9391	-41.6314
RT 452A-60	550	121.9217	-41.6229
RT 453	0	0	-90
RT 453	600	0	-90
RT 454	0	0	-90
RT 454	615	0	-90
RT 455	0	0	-90
RT 455	305	0	-90
RT 456	0	0	-90
RT 456	800	0	-90
RT 457	0	0	-90
RT 457	720	0	-90
RT 458	0	0	-90
RT 458	460	0	-90
RT 459	0	0	-90
RT 459	830	0	-90
RT 460-45	0	270	-45
RT 460-45	400	270	-45
RT 460-55	0	270	-55
RT 460-55	300	270	-55
RT 460-80	0	270	-80
RT 460-80	720	270	-80
RT 461	0	0	-90
RT 461	1180	0	-90
RT 462A	0	0	-90
RT 462A	1020	0	-90
RT 463-45	0	24	-45
RT 463-45	820	24	-45
RT 463-60	0	24	-60
RT 463-60	530	24	-60
RT 464	0	0	-90
RT 464	780	0	-90
RT 465	0	0	-90
RT 465	1020	0	-90

BHID	Depth	Bearing (°)	Dip (°)
RT 466-60	0	328	-60
RT 466-60	470	328	-60
RT 467	0	0	-90
RT 467	960	0	-90
RT 468	0	0	-90
RT 468	260	0	-90
RT 469	0	0	-90
RT 469	855	0	-90
RT 470	0	0	-90
RT 470	765	0	-90
RT 471	0	0	-90
RT 471	725	0	-90
RT 472	0	0	-90
RT 472	965	0	-90
RT 474	0	0	-90
RT 474	585	0	-90
RT 475	0	0	-90
RT 475	520	0	-90
RT 476	0	0	-90
RT 476	665	0	-90
RT 477	0	0	-90
RT 477	375	0	-90
RT 478	0	0	-90
RT 478	435	0	-90
RT 479	0	0	-90
RT 479	1000	0	-90
RT 480	0	0	-90
RT 480	600	0	-90
RTC 459	0	0	-90
RTC 459	279	0	-90
RTC 461	0	0	-90
RTC 461	1024.5	0	-90

Appendix C

Hazen Mineralogy Report

This letter report provides Hazen Research, Inc.'s summary of a mineralogical evaluation, using QEMSCAN technology, of a whole ore sample (HRI 53333-1), a rougher tails sample from flotation Test 3641-108, and a H_2SO_4 acid bake–water leach residue (Test 5, 3553-27-7). The whole ore sample was provided by Texas Rare Earth Resources (TRER), reportedly from their Round Top Mountain Project in Hudspeth County, Texas. The flotation tails and leach residue samples were produced in laboratory experiments conducted at Hazen using the sample provided by TRER. The main objectives of the study were to:

1. Identify the minerals that contain the rare earth elements (REE) in the ore, in particular the high revenue-generating elements yttrium and dysprosium.
2. Identify the mode of occurrence of REE-bearing minerals that are lost to the flotation tails.
3. Characterize the residual REE minerals in the leach residue.

The samples analyzed by QEMSCAN are described in more detail in later sections. The main results are as follows:

1. An yttrium-rich fluorite is the main carrier of yttrium and dysprosium.
2. The yttrium-rich fluorite is fine-grained (up to 40 µm but usually less than 10 µm).
3. Yttrium-rich fluorite levels appear to be slightly reduced in the flotation rougher tails when compared with the head.
4. Yttrium-rich fluorite levels in the leach residue are considerably lower than in the head. Residual yttrium-rich fluorite is locked in silicate gangue.
5. Zircon and iron-rich biotite in the residue show evidence of leaching.

Simple Description and Preparation

<u>Whole Ore (HRI 53333-1)</u>

The whole ore sample is a composite and was assigned the Hazen internal reference number 53333-1 on receipt from TRER. A portion of the composite was ground to 100% passing 1.7 mm (10 mesh) for mineral processing. A representative split was then submitted for QEMSCAN analysis. The split was screened at 38 µm and one polished section of each of the size fractions was prepared and analyzed. More than 90% of the mass was contained in the plus 38 µm fraction. The data presented here are the combined results from both size fractions. The yttrium concentration is 211 ppm, dysprosium is 29 ppm, zirconium is 0.107%, and thorium is 16 ppm; total TREE + Y is 0.05%. The analytical work was conducted by Activation Laboratories (Actlabs) (Ancaster, Ontario). Yttrium and zirconium were analyzed by inductively coupled plasma (ICP) spectroscopy; dysprosium, all other REE, and thorium were analyzed by ICP–mass spectrometry.

Flotation Rougher Tails

The rougher tails from flotation Test 3641-108 (repeat of Mountain States R&D International, Inc. (Vail, Arizona) Test 17 conditions with a 20 min grind) were mounted in a polished section without screening. The measured 80% passing size (P_{80}) at that grind was 85 µm. The rougher tails represent about 88% of the total sample mass. About 55% of the total yttrium and 56% of the total dysprosium reported to the rougher tails. The reagent schedule and dosages are shown in the data sheet (enclosed).

Acid Bake–Water Leach (ABWL, Test 5, 3553-27-7)

Whole ore, ground for 20 min with a P_{80} of about 70 µm, was acid baked (H_2SO_4) and water leached. Inductively coupled plasma analyses indicated a high extraction of yttrium, about 94%. The residue of this ABWL was mounted as a polished section and analyzed by QEMSCAN. The residual yttrium is 13 ppm, dysprosium is 2.1 ppm, zirconium is 0.08%, and thorium is 35 ppm; TREE + Y is 0.004%, which is more than an order of magnitude lower than in the head sample.

Mineral Abundance Results

Based on Actlabs data, the head sample contains 0.05% TREE + Y. At the low levels of elements of interest in the Round Top ore, it must be noted that the mineralogical results presented here may not be entirely representative of the whole ore. There are very few occurrences of the minerals of interest in the exposed plane of a single polished section. For this reason, the data presented here should be regarded as indications for the mode of occurrence of the REE-bearing minerals in the ore. The results of the mineral abundance analyses of the three samples are summarized in Table 1. The minerals identified in the ore and the flotation rougher tails are described in the Whole Ore section. Additional phases formed during the ABWL process are described in the ABWL section.

Table 2. Mineral Abundances

Sample	Composite	Rougher Tails	ABWL Residue
ID	**53333-1**	**3641-108**	**3553-27-7**
Mineral	**Analysis, mass %**		
Yttrofluorite	0.06	0.04	0.003
Zircon	0.27	0.18	0.34
Zircon(Hf)	0.04	0.03	0.08
Th Mineral	0.07	0.04	0.03
Bastnäsite or Cerite	0.01	0.01	0.0002
Columbite	0.09	0.09	0.02
Xenotime-(Y, Yb)	0.002	0.002	0.00002
Monazite	0.0004	0.0002	0
Quartz	27.6	26.8	31.3
K-Feldspar	30.8	29.7	29.2
Na-Feldspar	30.7	32.0	33.6
Mica and Chlorite	2.5	4.9	3.1
Fe-Rich Biotite	2.4	2.9	0.9
Fluorite	0.7	0.07	0.0005
Carbonate	0.2	0.02	0.001
Fe Oxide and Fe Hydroxide	0.9	0.7	0.4
Pb–Nb–Ta Oxide	0.01	0.01	0.001
Cryolite	1.8	1.1	0.04
Gearksutite	0.2	0.04	0.0002
Thomsenolite	0.0001	0	0
Ralstonite	0.1	0.04	0.0003
Mn–Zn–Pb Oxide or Hydroxide	0.08	0.01	0.0001
Sn-Bearing Minerals	0.03	0.05	0.02
Miscellaneous	0.9	0.4	0.1
Unidentified	0.5	0.7	0.4
Si-S Phase	nd	nd	0.4
Al Sulfate	nd	nd	0.01
Total	**100**	**100**	**100**

nd = not detected

Whole Ore

In general, REE minerals and REE-bearing minerals occur intimately intergrown with each other or with gangue and are very fine-grained, making the identification of minerals and chemical compositions difficult.

An yttrium-rich fluorite (here called yttrofluorite) is the main REE mineral in the ore. Its concentration was determined to be less than 0.1%. Yttrofluorite occurs up to 30 µm in size, but is usually less than 10 µm. It is mainly intergrown with feldspar, and to a lesser degree with quartz and mica. It also occurs as liberated grains. When yttrofluorite is intergrown with gangue, it usually shows some surface exposure. Small inclusions of yttrofluorite in thorite, which is usually locked in zircon, were also observed. Figures 1 and 2 show examples of yttrofluorite intergrown with gangue. The chemical composition of yttrofluorite is variable. It contains mainly the heavy rare earth elements ytterbium, dysprosium, and erbium, but can also contain low levels of gadolinium, samarium, cerium, and neodymium. Calcium levels are variable and show an inverse correlation with yttrium. Occasionally, yttrofluorite shows some alteration at the edges, with increased iron and reduced yttrium compared with the center of the particle. Possibly, invasive iron-rich fluids led to the changes. Ultratrace amounts of an yttrium mineral that contains light rare earth elements (LREE) only was also observed. This phase was grouped under yttrofluorite.

Ultratraces of an ytterbium-bearing xenotime ($(Y,Yb)PO_4$), locked in gangue, were observed and were less than 5 µm in size. This xenotime also contains erbium and dysprosium, and minor gadolinium, neodymium, samarium, and thorium. Erbium levels appear to be higher than those of dysprosium.

Trace levels of bastnäsite ($(Ce,La)(CO_3)F$) or cerite (with a general formula of $Ce_9Fe(SiO_4)_6[(SiO_3)(OH)](OH)_3$), or both, were observed, with a maximum observed size of 15 µm. This mineral, or minerals, probably contains the major portion of the LREE in the ore. Bastnäsite or cerite may also contain low levels of yttrium, thorium, uranium, calcium, and lead.

Monazite ($(Ce,La,Nd,Th)PO_4$) may be present as well.

The measured concentration of zircon was about 0.3%. Zircon usually contains measureable concentrations of hafnium. These can be relatively high, and zircon that contains elevated hafnium concentrations (estimated at greater than 10%) was distinguished from zircon with less hafnium. Zircon grains up to 100 µm were observed. It is very common for zircon to include a thorium mineral (probably thorite) as very fine inclusions (Figure 3). Zircon may also include fine inclusions of an yttrium-rich mineral (probably yttrofluorite). Zircon also occurs with no or very few inclusions of thorite (Figure 4).

Thorite ($ThSiO_4$) is probably the main thorium- und uranium-bearing mineral. Because of the thorium-containing minerals being so fine-grained, it cannot be excluded that other thorium minerals are present as well. Yttrium, ytterbium, erbium, uranium, and iron were observed in thorite. The x-ray signals may have originated from submicroscopic inclusions of other minerals. Thorite up to 30 µm in size was observed (Figure 4).

Columbite-(Fe,Mn) up to about 80 µm in size appears to be the main niobium mineral in the ore. Columbite contains manganese, iron, and tantalum. Niobium and tantalum are also observed in lead-rich niobium–tantalum oxide or hydroxide and in a tin-rich niobium–tantalum–iron–manganese oxide (probably foordite). Tin was also observed as tin oxide (cassiterite).

Iron oxide (mainly magnetite that is oxidized to hematite to a large degree) and iron-rich biotite are the main iron-bearing minerals. It is estimated that magnetite and hematite contain about 60% of the iron in the sample. The remainder is mainly present as iron-rich mica. The concentrations of iron oxide and iron-rich mica are about 1 and 2.5%, respectively. Mica (probably muscovite) and chlorite minerals were also observed. Their combined concentration was measured at 2.5%

Quartz, Na-feldspar (albite) and K-feldspar are the main gangue minerals. They are usually intergrown with each other. At the grind size studied, quartz is not well liberated.

Carbonate (calcite) concentrations were measured at 0.2%. The main fluorine-bearing minerals are cryolite (Na_2AlF_6), fluorite (CaF_2), gearksutite ($CaAl(OH,F)_5 \cdot (H_2O)$), and ralstonite ($Na_xMg_xAl_{2-x}(F,OH)_6 \cdot (H_2O)$). Traces of thomsenolite ($NaCaAlF_6 \cdot (H_2O)$ may also be present. Liberated cryolite, up to 450 µm in size, was observed. It also occurs intergrown with silicate gangue. Gearksutite occurs as liberated grains and intergrown with fluorite.

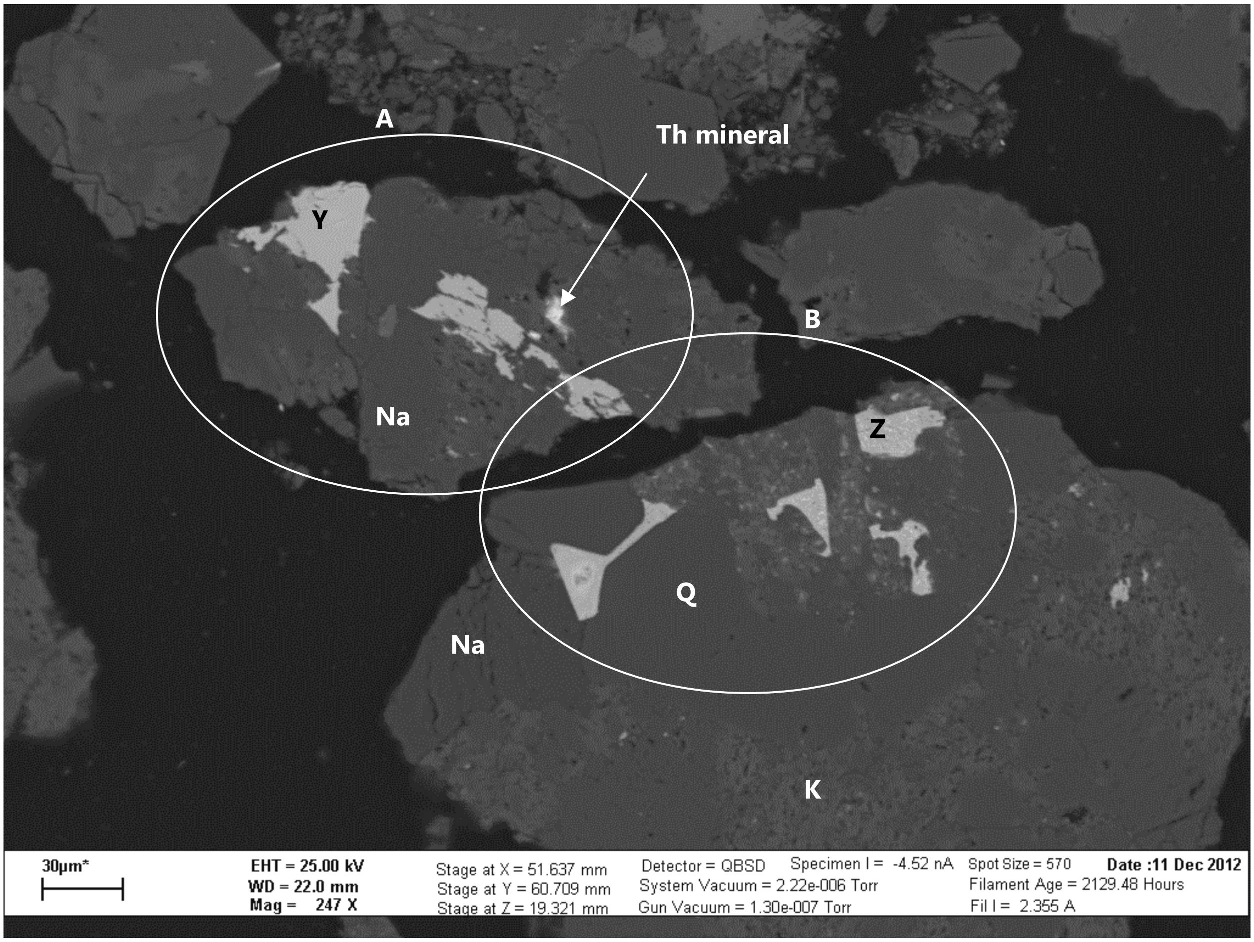

Figure 28-1. Backscattered Electron (BSE) Image of Gangue Particles Containing Yttrofluorite (Y) and Zircon (Z) in Head Sample

The scale bar on the bottom left-hand side is 30 µm. Brighter particles in circle A are mainly yttrofluorite and particles in circle B are mainly zircon. The gangue minerals are mainly albite (Na–feldspar, Na), K–feldspar (K), and quartz (Q). At high magnification, very small inclusions in zircon of a thorium mineral (probably thorite) in circle B are visible. Slightly larger thorite is also observed in circle A. The brighter specks surrounding zircon in circle B are probably small inclusions of iron-rich mica and iron oxide or both.

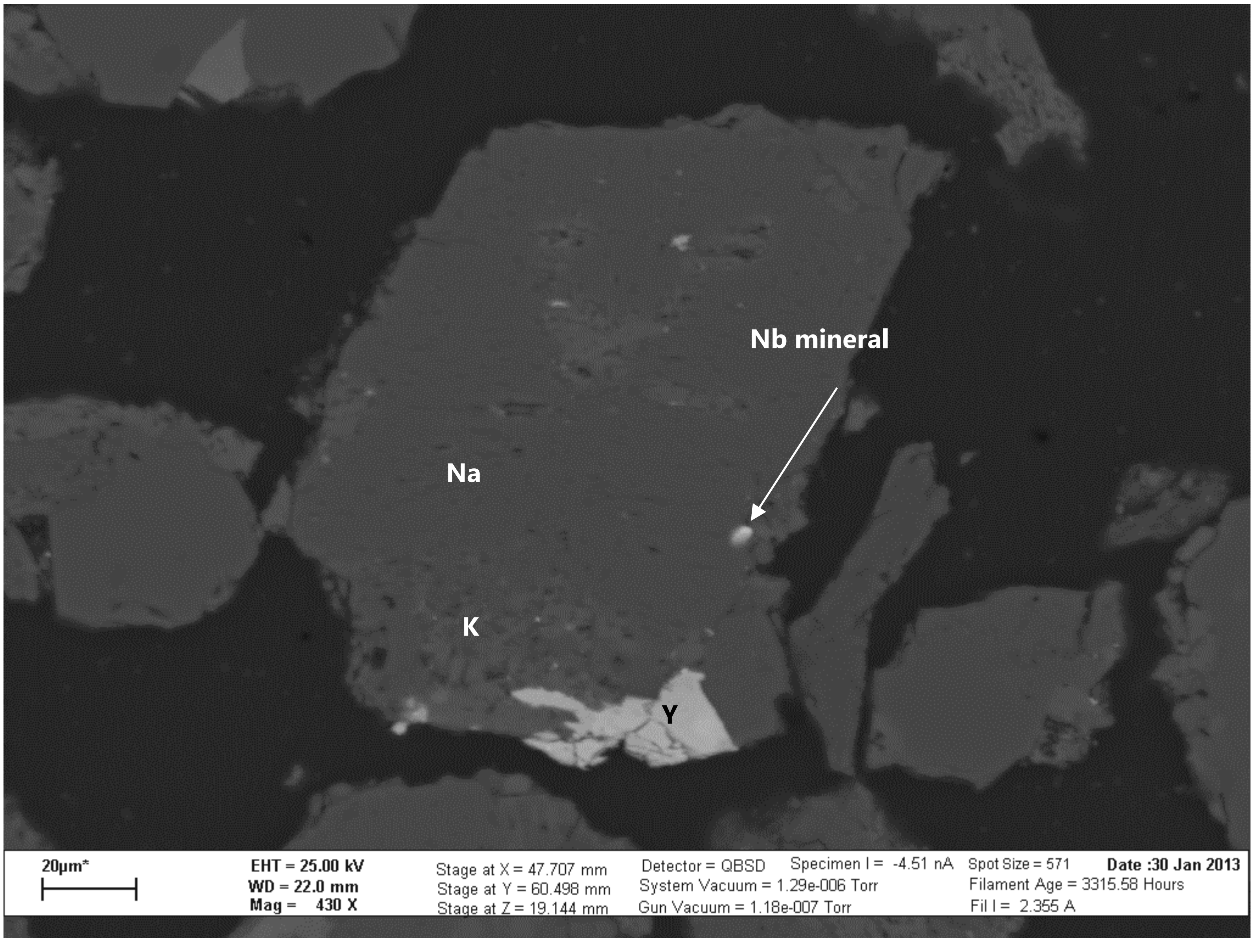

Figure 28-2. BSE Image of Gangue Particle Containing Yttrofluorite (Y) in Head Sample

The scale bar is 20 µm. Yttrofluorite is exposed at the surface of the gangue particle that contains mainly albite (Na) and K–feldspar (K).

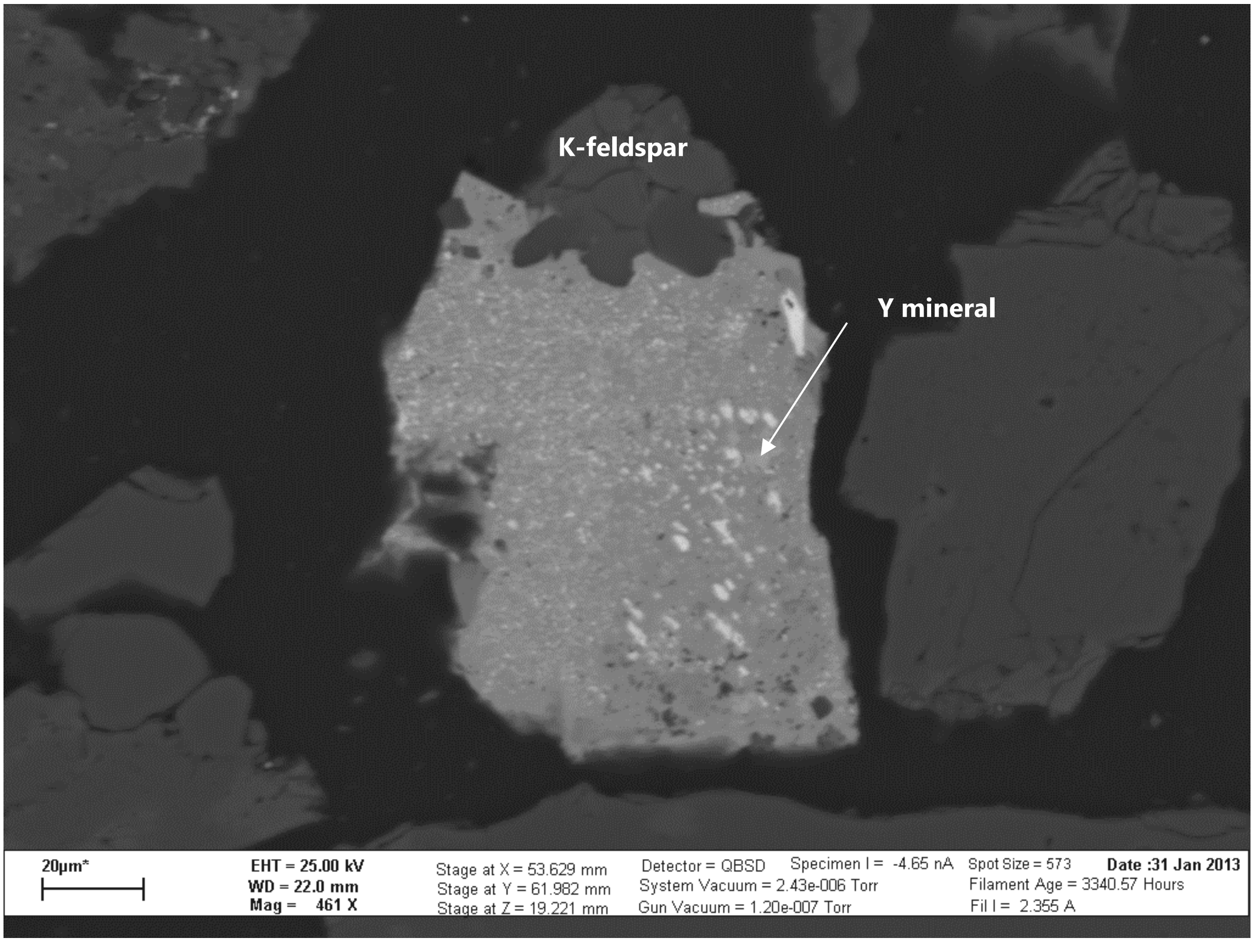

Figure 28-3. BSE Zircon with Thorite Inclusions in Head Sample

The zircon particle contains many fine inclusions of thorite (light gray). Also observed, but not very common, are inclusions of yttrium-rich grains (probably yttrofluorite, slightly brighter than zircon).

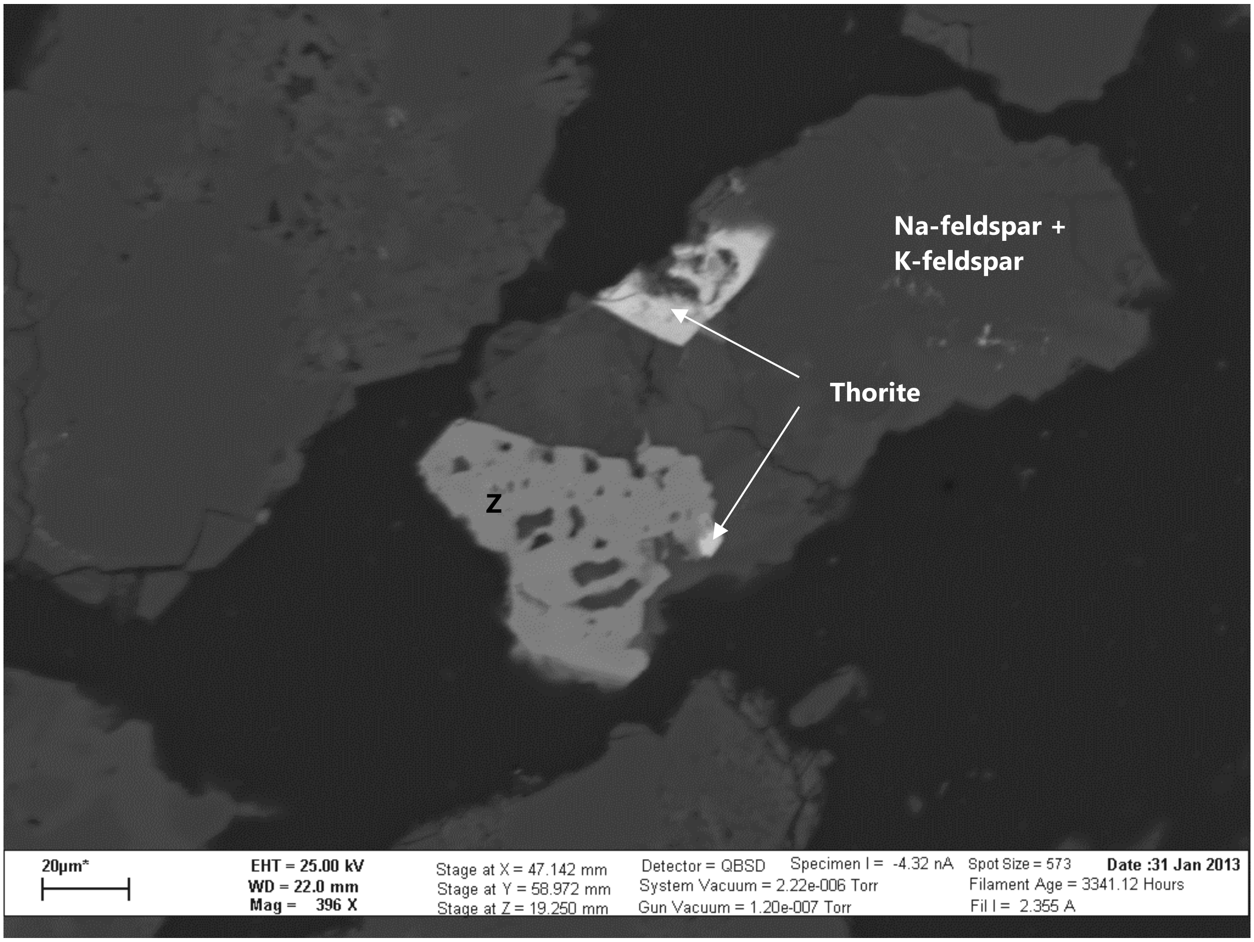

Figure 28-4. BSE Image of Zircon in Head Sample

Thorite is associated with the zircon and intergrown with feldspar.

Rougher Tails

The results of the mineral abundance analysis of the rougher tails are presented in Table 1. The tails represent 88% of the total mass of the feed to the flotation test. The concentrations of mica and chlorite and iron-rich biotite are higher in the tails when compared with the whole ore sample, and zircon and fluoride minerals show lower levels than in the head. The measured concentration of yttrofluorite at 0.04% is slightly lower in the tails than in the head (0.06%). At this low level, it is not possible to evaluate if yttrofluorite floated under the conditions used or if the observed variation is statistical variance. The chemical analyses of the flotation products show that 55% of the total yttrium and fluorine, each, occur in the rougher tails. Therefore, the observed variation of the yttrofluorite concentration in the whole ore sample and rougher tails is probably statistical variance.

Yttrofluorite in the tails was up to 40 µm in size and is generally intergrown with silicate gangue, but often exposed at the surface of the composite gangue particles. Occasionally, yttrofluorite was also observed as liberated grains.

ABWL Residue

Chemical analyses of the feed and residue indicate an yttrium extraction of 94%. The measured levels of yttrofluorite in the residue were 0.003% compared with 0.06% in the leach feed. Residual yttrofluorite occurs locked in silicate gangue and occasionally in zircon. Figure 5 shows an example of residual yttrofluorite in iron-rich biotite.

The measured concentration of zircon in the residue is similar to that of the head sample. Zircon grains exhibit signs of leaching at the edges (Figure 6). This is also supported by the lower zirconium level in the residue (0.08 versus 0.11%) measured by ICP analysis in the head sample. The residual layer at the edge of zircon contains mainly silica and some sulfur. Layers with a similar chemical composition were also observed at the edges of iron-rich biotite (Figure 7). When observed at the edge of biotite, this layer also contains potassium. Although the measured concentration of iron oxide in the residue is less than the concentration in the whole ore (0.4 versus 0.9%), the remaining iron oxide showed no obvious evidence of leaching. These observations are considered evidence that the iron in the leach liquor may originate mainly from some leaching of biotite.

A phase with a similar composition (silicon–sulfur) was also observed between clusters of particles (Figure 8). It is believed that some of the silicon–sulfur–potassium phase, observed next to biotite, may also be a gel-like, silica-rich precipitate. The total measured concentration of the silicon–sulfur phase, which may also contain potassium, was 0.4%. To shed more light on whether this phase is a residual layer or a precipitate, or both, would require more work.

An aluminum sulfate precipitate (probably alunogen ($Al_2(SO_4)_3 \cdot 17(H_2O)$)) was also observed (0.01%).

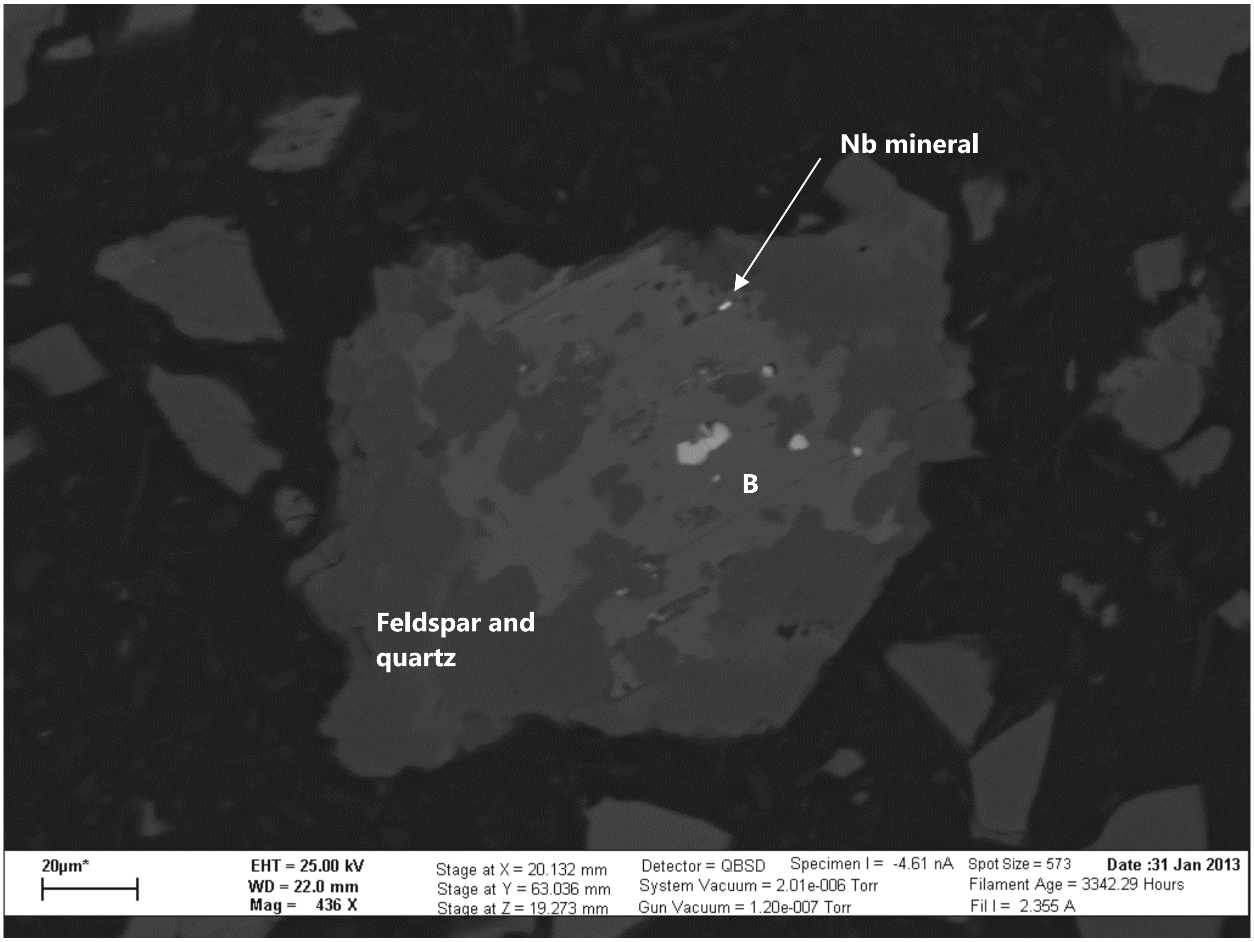

Figure 28-5. BSE Image of Yttrofluorite (light inclusions) in Iron-Rich Biotite (B) in ABWL Residue

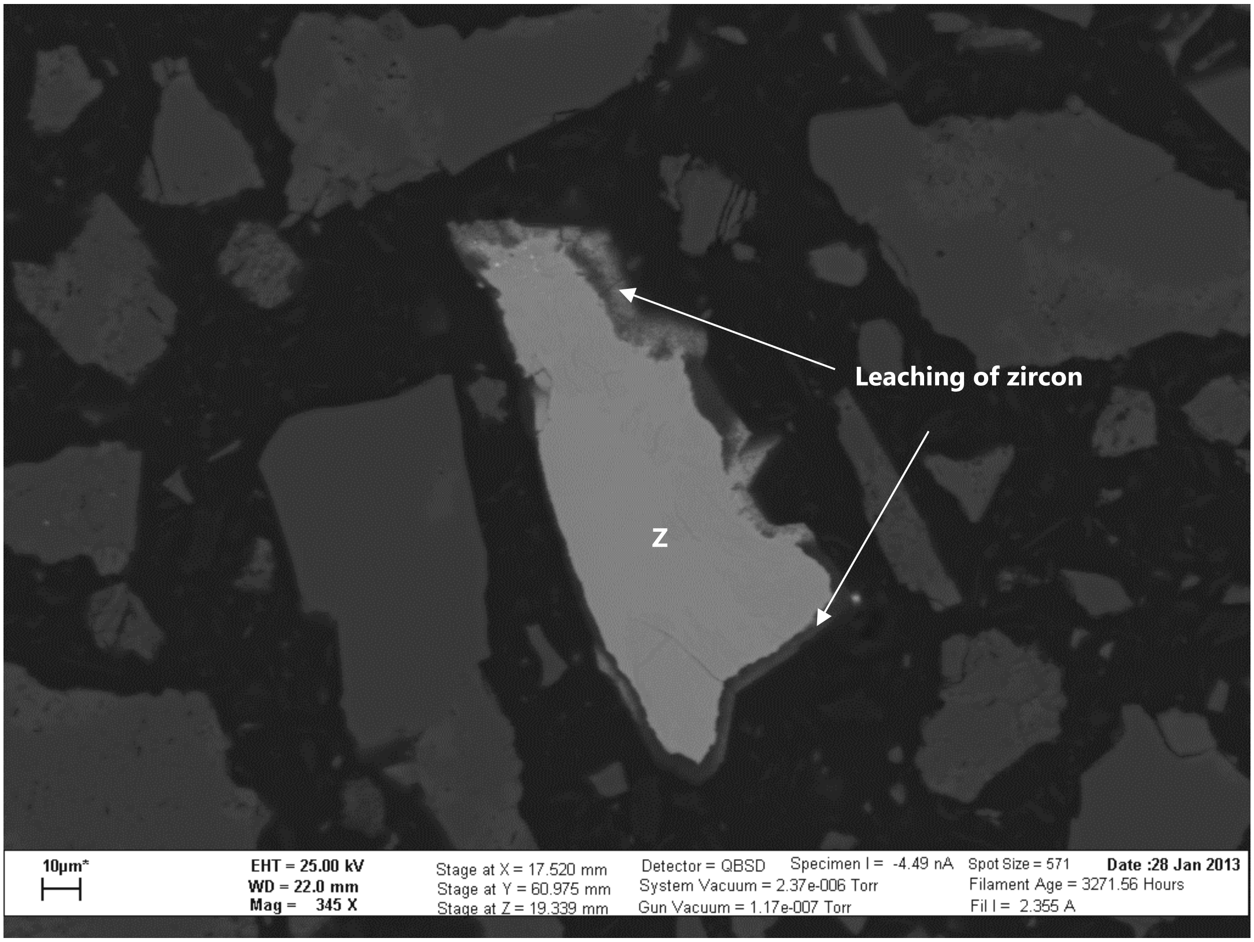

Figure 28-6. BSE Image of Zircon (Z) with Apparent Leaching at the Edges in ABWL Residue

The length of the scale bar is 10 µm. This zircon grain shows evidence of leaching at the edges. The leached rim is about 5 µm thick and chemically consists of silicon oxide and some sulfur.

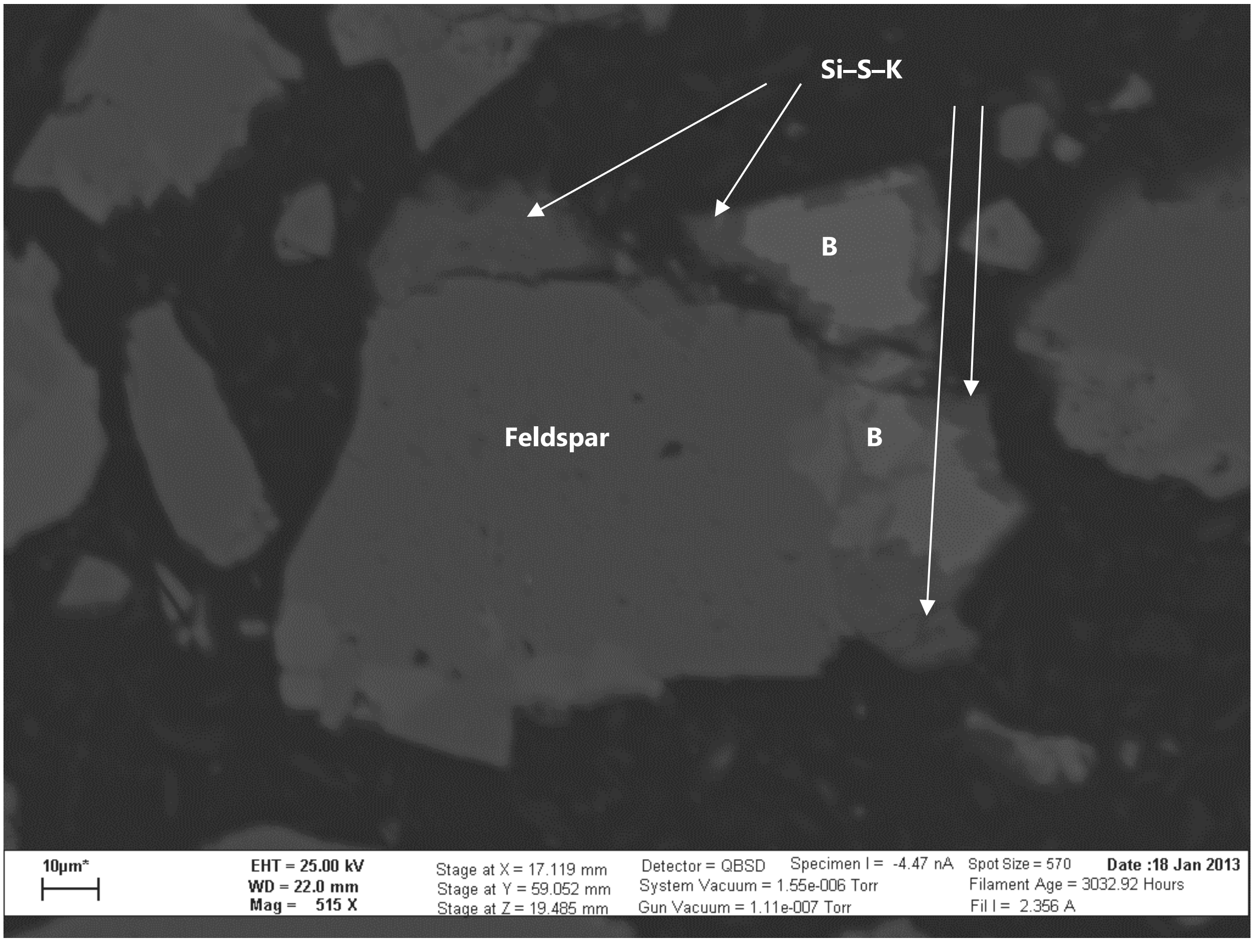

Figure 28-7. BSE Image Showing Evidence of Leaching around Iron-Rich Biotite (B) in ABWL Residue

The areas at the edge of the biotite where leaching is evident are marked with arrows. The phase is silicon-rich and also contains sulfur and potassium (Si–S–K).

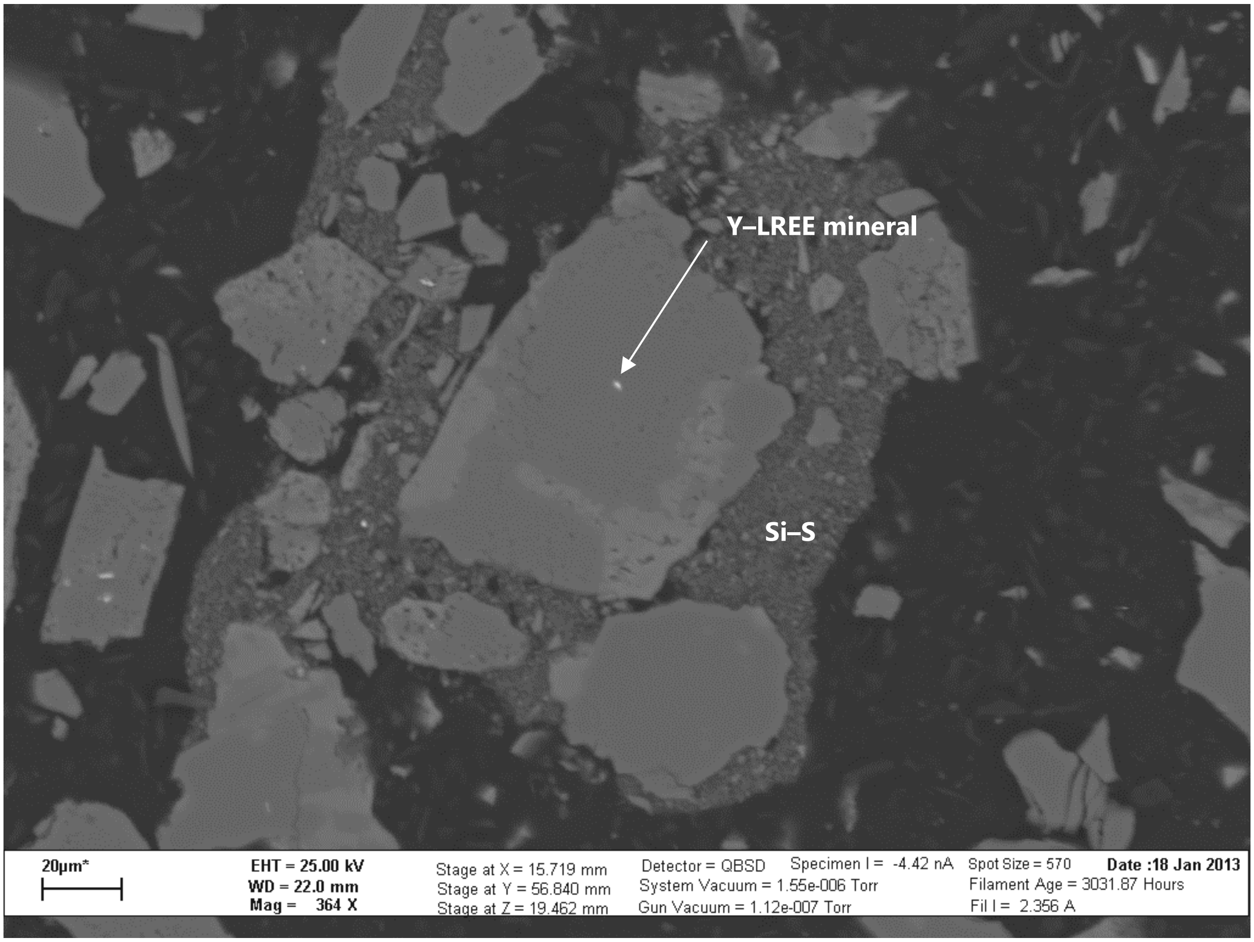

Figure 28-8. BSE Image of Gangue Particles that Appear to be Cemented by a Si–S Phase in ABWL Residue

A Si–S phase appears to cement larger gangue particles and also encloses very fine-grained particles. The silica-rich phase appears to be a precipitate rather than a residual phase after removal of ions.