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HALLGARTEN & COMPANY

Coverage Initiation

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Texas Rare Earth Resources
(TRER:OTCQX)
Strategy: Long

Key Metrics

Price (USD)	$	0.41
12-Month Target Price (USD)	$	0.70
Upside to Target		71%
12mth hi-low		$0.20-0.73
Market Cap (USD mn)	$	15.17
Shares Outstanding (millions)		37.0
Float		62%

Texas Rare Earth Resources

A Treasure Chest of Specialty Metals

- + Round Top is one of the most interesting Rare Earth (notably Yttrium and Dysprosium) properties in the space with a very surprising array of by-product metals
- + Demand for Fluorite-based products is strong with a long-term secular decline in Chinese production
- + Beryllium has strong strategic implications (as does Yttrium and Dysprosium) for the US and there is solid internal demand in the US that is currently being satisfied from imports from ex-CIS stockpiles
- + The slashing of the size of the project in the latest PEA was a sound recognition of the new dynamic and mood and in the REE space. Right-sizing is the mantra to repeat..
- + The deposit is unique in several of its mineral components and those offtakers wanting exposure to hard-to-corner metals, like Yttrium, have virtually no choice but to deal here
- + Management has shown themselves to be adaptable to REE market conditions
- ✖ The Rare Earth boom (and bust) has been a wild ride, with the sub-sector just starting to crawl out of the bomb shelter. Early days yet…
- ✖ Financing is required to move the project into the feasibility phase

TRER – Rare Earths with Extra Icing on the Cake.

There is a dangerous tendency to claim that Heavy Rare Earths are now the sole salvation of that part of the Rare Earth group that survived the meltdown. If anything, just having HREEs may not be enough for some projects. Getting built is one thing, but making a profit is another thing and now the focus is turning towards by-products that might provide the icing on the cake where it might otherwise be lacking.

Texas Rare Earth Resources manages to bring together a number of by-products so it could be firing on three cylinders if not four, eventually. Obviously there are the Rare Earths (largely Yttrium and Dysprosium), then there is the prospect of Beryllium production (the reason the site was first explored) and moreover there is Fluorspar, a mineral that we opined upon early in 2013 with our note on Canada Fluorspar (CFI.v). These matters are now known quantities (as are the sizeable Niobium and Tin components in the resource). Not all is to NI43-101 standards though (at least the Fluorspar and Beryllium aren't). The more amorphous potential by-product is uranium, as with so many other REE deposits. The good thing is that we do not need to rely upon that for this project's economics to gain traction.

Like some enormous mineralogical smorgasbord, the Round Top deposit lets those who seek to mine it, pick and choose amongst a variety of different production combinations. Therefore the PEA that is to hand may not necessarily be the final outcome with the opportunity to tweak further the process and indeed, even the focus, for instance if the company decides to promote Yttrium over the host of other Lanthanide series Rare Earths.

The Post-Apocalypse World

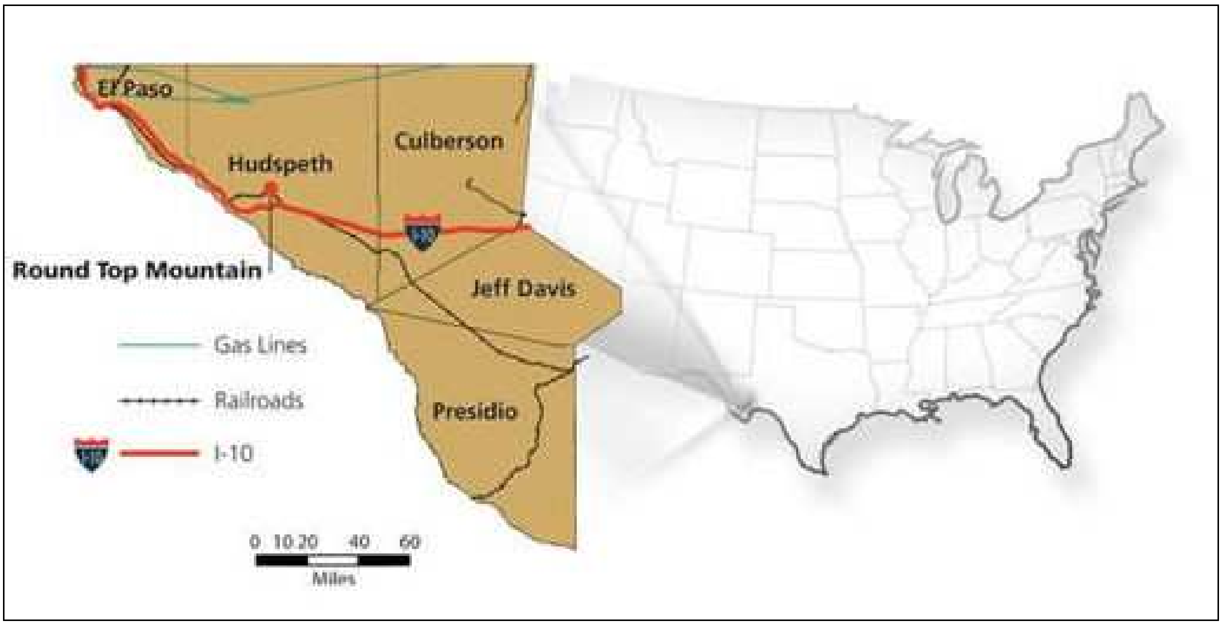
Rare Earths have been more like scorched earth in recent years. The sub-sector has been a true Bonfire of the Vanities with scores (if not hundreds - if some tallies can be believed) of companies going to their doom. However, like any apocalyptic event, there follows in its wake signs of green shoots.

The passage of time has made clearer which companies shall be the survivors and which the victims. There are still though some of the "household names" of the REE space though who have money in the kitty and hope to fight another day despite their projects being essentially dead in the water. This makes sorting the wheat from the chaff all the more important as the space awakes from its dormancy. It is all too easy to go for the larger market cap survivors who may not have any more chance of moving forward than they did the first time around.

If never a truer word was spoken on this space it was when Jack Lifton, industry consultant and TRER board member, brought into vogue the term "right-sizing". He is on record as having written, "The right sized mines with proven metallurgies and the best mix of critical rare earths will enter the market on schedule. ………… for an ideal producer, (these) are the lowest costs, the best mix of critical rare earths, and the right size - a size small enough to be able to supply the market and remain profitable even with reduced production". What he said then has even more poignancy now.

Background

The Round Top Project is located approximately eight 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.



History

The first records of exploration in Sierra Blanca date back to the 1970s when W.N. McAnulty initiated trenching and limited drilling of fluorite deposits in the vicinity of TRER's project. The prospector 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, the major specialty chemicals company with a beryllium fabrication division, initiated exploration at Round Top for beryllium. In 1987, Cyprus Metals 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.

During the Cabot-Cyprus development project, the Texas Bureau of Economic Geology 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 (Geological Society of America Special Paper 246, Price et al., 1990).

In late 2007, Standard Silver Corporation (renamed TRER in 2010) acquired prospecting permits from the Texas General Land Office (GLO).

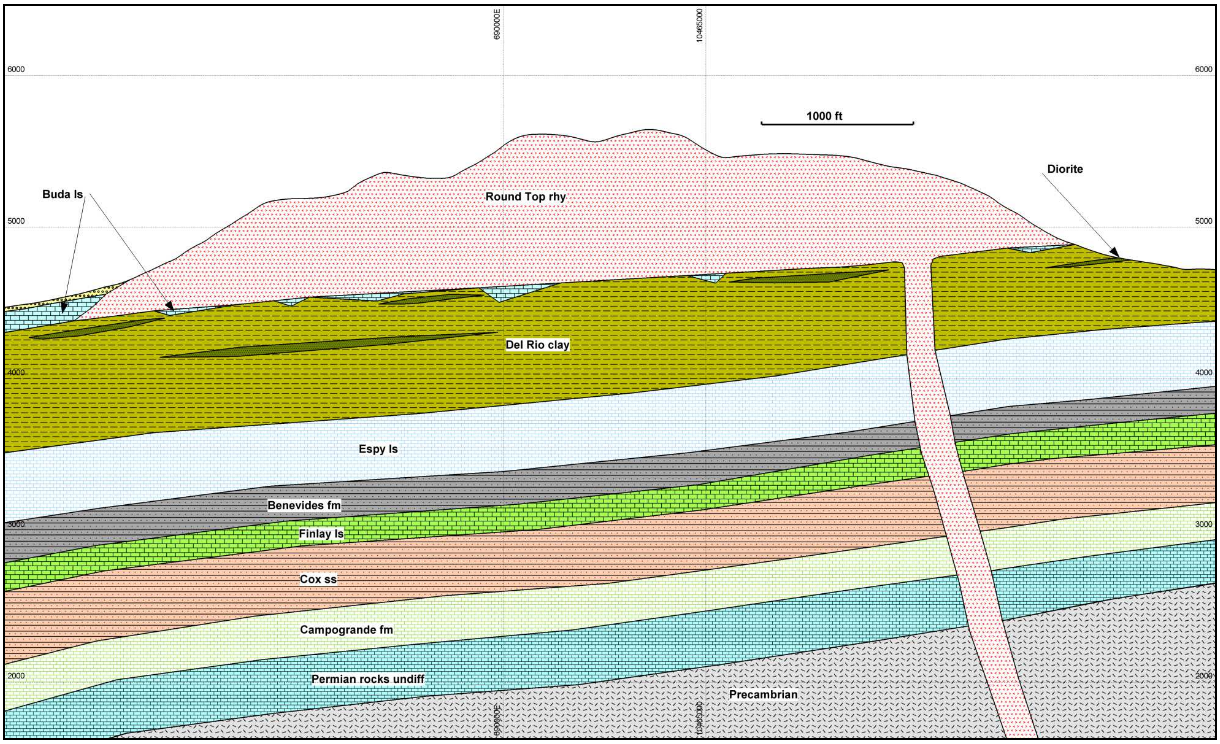
The Geology

The zone is made up of the five mountains Triple Hill, Sierra Blanca Peak, Little Blanca, Round Top, and Little Round Top, which 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.

The Round Top Peak laccolith was, as mentioned, intruded into limestone and sandstone layers. The Cretaceous sediments were domed upward by the rhyolite intrusion and later eroded, exposing the Round Top Peak rhyolite.

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 were reported to be Li, Be, F, Zn, Rb, Y, Zr, Nb, Sn, REEs, Th, and U.

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 point to yttrium-rich fluorite as a major host of yttrium and REEs. Subsequent synchrotron studies demonstrate that essentially all of the yttrium and heavy rare earths reside in yttrium-bearing fluorite. The yttrium-rich fluorite is fine-grained, usually less than 10 micrometers in diameter.



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.

Exploration & Metallurgy

As previously mentioned, Standard Silver (now TRER) picked up the project not from previous operators but from the GLO. In 2008, upon opening the old decline, 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.

Though incomplete, reliable data begins with Cyprus's 1987 campaign which consisted of 44 identifiable RC holes totaling 9,262 ft and two 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.

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.

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

TRER drilled an additional 64 RC holes in 2011 totaling 26,915 ft. This campaign was designed to:

- define the extent of the Round Top rhyolite
- validate historical drill data
- provide sample support for the geologic and resource models

In 2012, an additional 16 RC holes and two diamond core holes were completed. Of the 18 new holes, totaling 10,483 feet, all but one was assayed. Assay results and drilling logs were received by Gustavson in January, 2013 and they began work on the resource.

In March 2013 the company announced that testing done at Hazen Research (in Golden, Colorado) had identified Yttrofluorite as the primary REE-bearing mineral in samples from the Round Top Deposit. More significantly, this mineral also carries the majority of the Heavy Rare Earth Elements. Yttrofluorite, due to its relative ease of dissolution in sulfuric acid as demonstrated in laboratory tests at Hazen, offers a distinct economic advantage over other less reactive HREE minerals.

Preliminary leach tests run on whole ore samples at Hazen's labs yielded Yttrium recoveries as high as 94% at 90-95°C with a sulphuric acid strength of approximately 10%. The result of this discovery was a decision to go with large-scale heap-leaching with on-going investigation on the optimization of the leach parameters and on pre-concentration by flotation and/or magnetic separation.

The Resource

Gustavson, however, were not the first to make an estimate on Round Top as Cyprus had established an internal resource of 300,000 tons of BeO in 1988 in conjunction with the feasibility study they did. It should be noted though that this resource would not qualify as a resource by NI 43-101 standards. 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 professionals from that firm involved in the Resource Estimate were Richard Schwering, Associate Geologist and M. Claiborne Newton, Chief Geologist and QP.

The resource is shown below:

	Element Symbol	Conversion Factor	Tonnage / Element Oxide	Measured (x 1000) gpt	Measured 230,984 oxide (kg)	Indicated (x 1000) gpt	Indicated 297,960 oxide (kg)	Measured + Indicated (x 1000) gpt	Measured + Indicated 528,944 oxide (kg)	Inferred (x 1000) gpt	Inferred 376,955 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	1.2699	Yb_2O_3	56.99	15,162,030	56.91	19,530,950	56.94	34,692,980	56.52	24,539,656
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	97,779,881	Total HREO	126,238,813	Total HREO	224,018,694	Total HREO	158,352,045
				Total REO	133,888,936	Total REO	173,371,071	Total REO	307,260,007	Total REO	218,176,364
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

The REE grades are nearly equal in all parts of the deposit, with some small hot spots for Yttrium. As can be noted the Yttrium resource is only exceeded by that of the Niobium content of the deposit.

The PEAs

In 2012, TRER completed a NI43-101 compliant PEA prepared by Gustavson Associates on the Round Top deposit in June 2012. Typical of those times, the management and consultants allowed expansion of the project to suit the tastes of a market obsessed with bigness. Some of the key metrics were:

- 80,000 tonnes-per-day processed, open-pit operation
- Annual total REO (TREO) sales of 10,800 tonnes
- 26-year mine life
- Project capital costs of $2.1 billion, including a 25% contingency

Within the next couple of months there was an almost total turnover of the board and this plan was committed to the bottom drawer, while the company returned to the drawing board.

The resource model in that PEA was updated with additional drilling and assay data and was documented in a resource statement by Gustavson Associates. The PEA released to the market in recent times is an update of the 2012 PEA and utilizes the resource estimate from the September 2013 study.

The assumptions on the size of the deposit were based on a preliminary resource model with an estimated indicated and measured resource of 529 million metric tons of rock containing 307 million kilograms of REO and an inferred resource of 377 million metric tons of rock containing 218 million kilograms of REOs.

In our opinion the mineral resource model and project economics should be further investigated with consideration to Fluorite and Uranium (and even Niobium) as a mineable resource.

The PEA assumes a processing rate of 20,000 metric tons of rhyolite per day or 7.3 million tons per year, a reduction of 75% from the amount envisaged in the first plan. This works on the concept of 20 years of mine life (compared to 26 years in the first version). The Base Case NPV at a 10% discount rate is estimated to be $1.47 billion.

- Initial Capex: $293 million (LOM capex of $845mn)
- Pre-tax NPV (at a 10% discount rate): $1.47 billion (based upon current spot REE pricing)
- IRR (Pre-Tax): 69%
- Payback Period: 1.5 years
- Initial Life of Mine: 20 years
- Life of Mine Gross Revenue: $7.9 billion
- Life-of-mine total cash flow is projected at $4.3 billion
- Life of Mine Op-Ex: $2.2 billion

Oxides	**Recovered Metal (tonnes)**	**Model Price**	**Value $mn**
Yttrium	32,907	22	724.0
Lanthanum	1,936	3	5.8
Cerium	7,319	4	29.3
Praseodymium	1,160	58	67.3
Neodymium	3,328	40	133.1
Samarium	1,288	5	6.4
Europium	10	540	5.4
Gadolinium	1,057	24	25.4
Terbium	448	930	416.6
Dysprosium	3,964	528	2,093.0
Holmium	993	350	347.6
Erbium	4,366	125	545.8
Thulium	812	1,025	832.3
Ytterbium	6,918	190	1,314.4
Lutetium	972	1,400	1,360.8
Gross Revenue			7,900.2
Texas State Royalty			496.0
Gross Income			7,404.3
Mining			278.0
Process			1,684.8
G&A			49.6
Subtotal Operating Costs			2,012.4
Contingency			201.2
Total Operating Costs			2,213.7
Operating Margin			5,190.6

This PEA utilizes the following unit costs:

Description	**$/mined ton**
Total Mining Operating Costs	$2.09
Total Process Operating Costs	$12.69
Total G&A Operating Costs	$0.37
Total Operating Expenditures	$15.16

This prompts a couple of thoughts for us. Clearly the company is not going to be burdened by a surfeit of the "rubbish" REEs like Cerium and Lanthanum that are being produced *en masse* by Lynas and Molycorp (not to mention Bayan Obo). TRER, when it reaches production, will be an overwhelming force in some of the most obscure REEs such as Thulium, Ytterbium and Lutetium. Production over the LOM of the individual metals is shown in the table on the preceding page. Cross-tabulating this with IMCOA's estimates of annual demand in 2016 for these metals we see that the total demand for Holmium, Thulium, Ytterbium and Lutetium is only 250 tonnes per annum. Dudley Kingsnorth, the esteemed author of IMCOA's REE analysis has production at 1,400 tpa in 2016. It is not clear where this is coming from but there is a distinct danger that the flood of product from TRER in these rarified Rare Earths could blow up prices in those specific elements, and we do not mean in a good way.

The increased supply of these exotics may actually generate more demand, but we would not discount a weakening of prices in these metals even if TRER resolves to stockpile them and leak them sparingly to the marketplace.

Below we can see the total capex as envisioned by the latest PEA.

Round Top: Cap Ex - Dec 2013 PEA			
($mns)			**LOM**
	Initial	**Sustaining**	**Capital**
Mine Equipment	6.079	30.082	36.161
Mine Development	3.475	10.000	13.475
Process Equipment	203.145	400.000	603.145
Development			0
Pre-Production Costs	20.975	2.250	23.225
Subtotal Capital	**233.674**	**442.332**	**676.006**
Contingency	58.418	110.583	169.001
Total Capital	**292.092**	**552.915**	**845.007**

It is important to note that the $400mn in sustaining capital is a very sizeable number indeed, with $340mn of it being heap leach pads and $60mn being solution management.

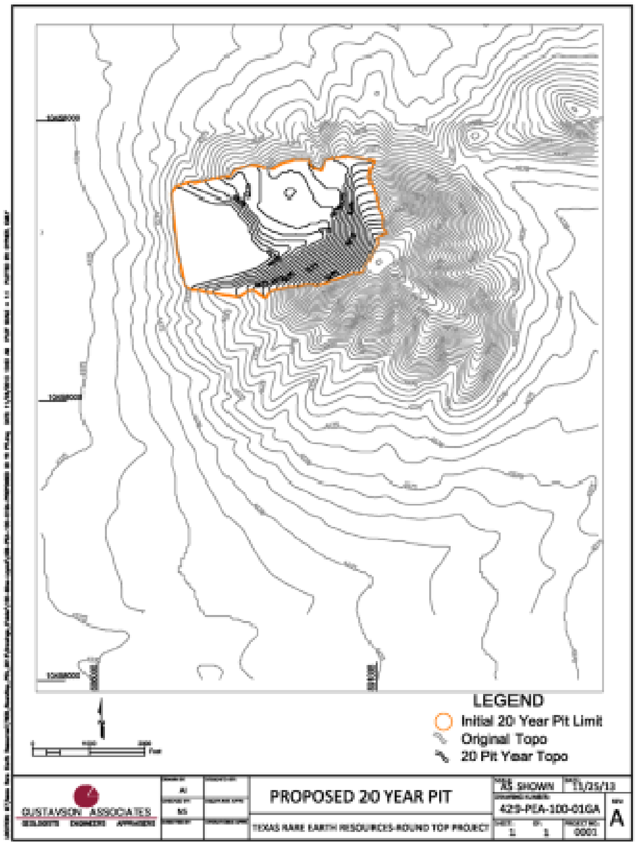
The specifics of the process capex are shown in the table that follows:

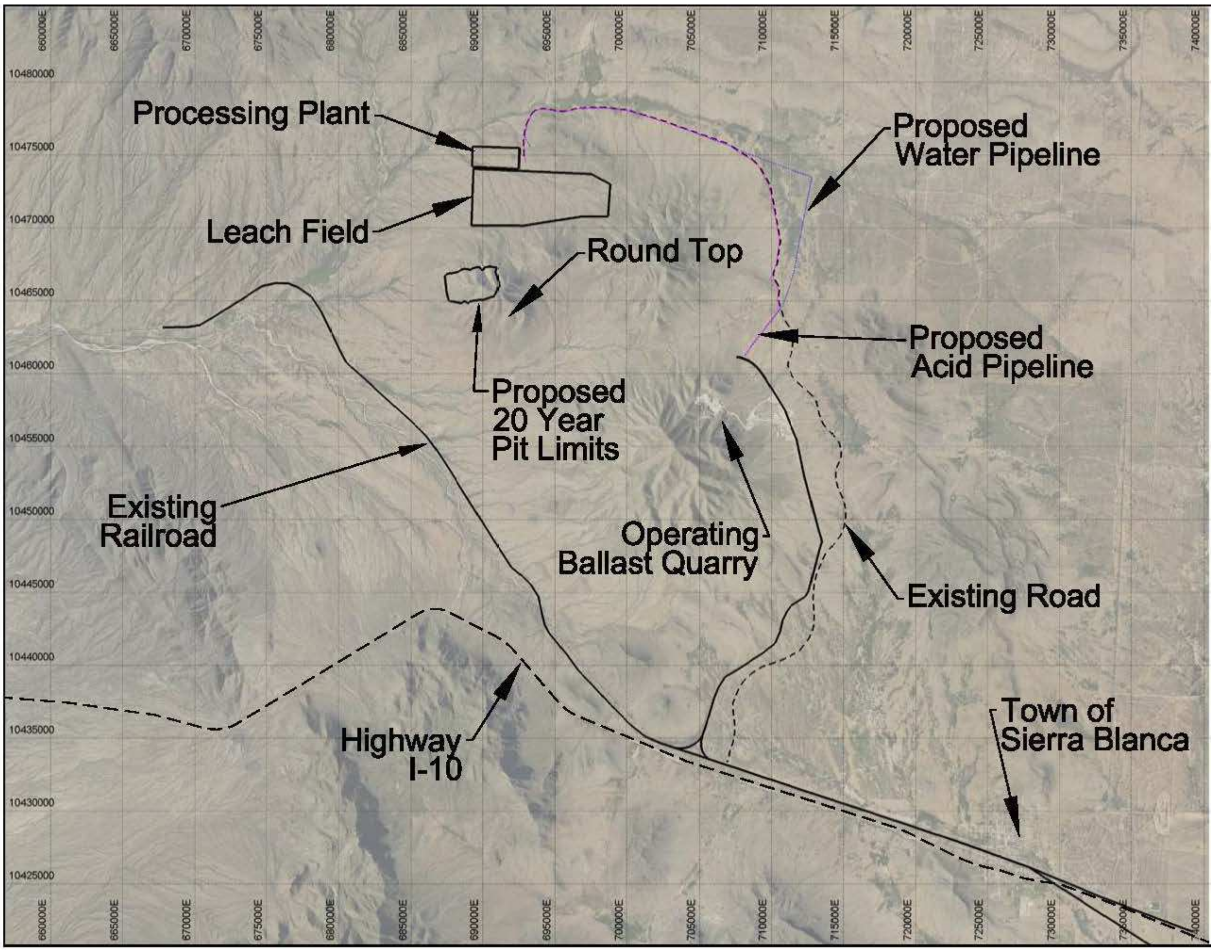
Round Top: Process Cap Ex ($mns)	
	Initial
Crushing Circuit	10.859
Conveying/Stacking	9.440
Heap Leach & Ponds	34.500
Solution Management	7.000
Tusaar Process Plant	10.000
Conventional Treatment	5.258
Water Treatment	3.000
Installation costs	34.425
Piping	12.009
Instrumentation	4.003
Building & Site Development	20.014
Auxiliary, Electric & Utilities	8.006
Outside Lines	4.003
Total Direct Costs	**162.517**
EPCM & Indirects	40.629
Subtotal Process Plant	**203.146**
Contingency	50.786
Total Process Plant	**253.932**

The Mine Plan

The map to the right shows the proposed 20-year pit shell at Round Top which essentially takes a large gouge out of the north-west side of the mountain. With regards to the latest PEA, side hill open pit mining methods are proposed with on-site processing facilities employing multiple solvent extraction and precipitation methods.

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 ratio with very simple bulk mining parameters.





The rhyolite will be mined in two 25 foot lifts on 50 foot benches. This matches medium-sized equipment (70 ton trucks and wheel loaders with an 11 yard bucket) with an assumed daily production rate of 20,000 metric tons or 22,000 short tons.

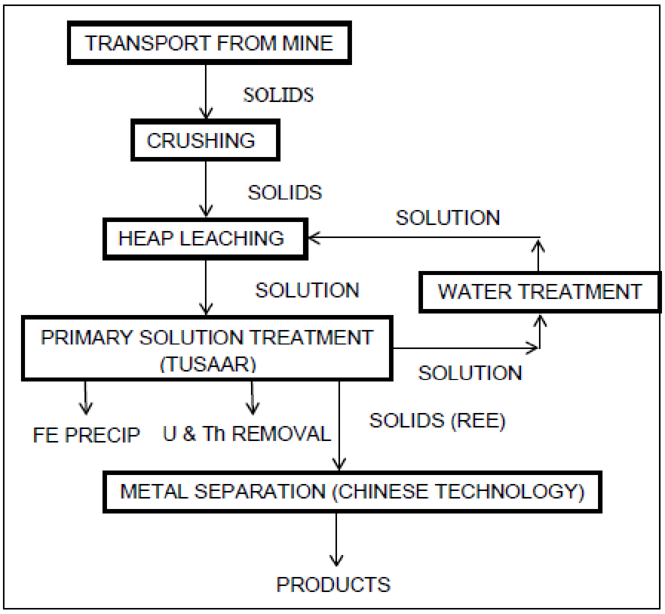
The site layout is shown in the map above. Mined material will be trucked to the in-pit crusher and transported via overland conveyor to the leach pad located approximately two miles away near the processing facility. In Gustavson's view this method of using trucks to haul the material a short distance 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 24/7. Based on preliminary testwork completed to date, process recovery in excess of 70% REE is anticipated.

The main steps in the conceptual process flowsheet developed for the PEA are:

1. Heap leaching of 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.



Tusaar was established in 2009 to commercialize a metal sequestering technology developed at the University of Colorado, Boulder.

The Tusaar technology involves the surface treatment and impregnation of granulated activated carbon with environmentally friendly organic compounds. It works in an acidic environment, targets over 40 different metals, requires minimal pre-treatment and is simple to use. In most applications the metals sequestered can be recovered if necessary although preliminary testing shows that metal saturated media also passes EPA mandated TCLP tests.

According to Tusaar the technology has one issued patent and two pending. It has applications in treating industrial waste and process streams, recovering/recycling rare earth & precious metals and the sequestering of actinides. The metals extracted are shown in the table below.

Aluminum	Antimony	Americium	Arsenic	Barium
Cadmium	Cesium	Cerium	Chromium	Cobalt
Copper	Dysprosium	Erbium	Europium	Gadolinium
Holmium	Iron	Lanthanum	Lead	Lutetium
Magnesium	Manganese	Mercury	Molybdenum	Neodymium
Nickel	Palladium	Praseodymium	Samarium	Scandium
Selenium	Silver	Strontium	Thallium	Terbium
Thorium	Thulium	Tin	Titanium	Tungsten
Uranium	Vanadium	Ytterbium	Yttrium	Zinc

Source: Tusaar

With reference to infrastructure the area is fairly depopulated but has a good array of existing services. The nearest population center is Sierra Blanca, 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.

A major rail line parallels Interstate 10 approximately three miles west and south of the mine site. A rock quarry operation has a rail road spur which is approximately three miles from the project.

Power is currently supplied to Sierra Blanca by El Paso Electric Company. Water for the project is planned to be supplied by a well-field located some three 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. In Gustavson's opinion the quality of the water is expected to be adequate for process water needs and the water will require treatment to be potable.

Rare Earths - that sometime object of desire

Since the Chinese shouted "Fire" in the cinema early in 2009 by banning exports (or at least talking of doing so), the mining space has been in a ferment trying to get its brain around elements that they had not heard of since high school chemistry (and seemingly not in some Schools of Mines). The REE fervour swept in upon investors who were still grappling with the enthusiasm that had been generated around lithium. Indeed such was the confusion and blending of different nascent "supply crises" in investors' minds that we met with asset managers who were referring to lithium as a REE because no-one had differentiated the two totally different stories for them.

There were a number of REE plays already out there and they represented a sub-sector for the truly well-informed or daring. Suddenly the searchlight zeroed on the extant names and the brilliant marketing efforts of Avalon Rare Metals paid off in a soaring price for that stock but in a more generalized feeling that something was going on and they acted as a conduit of information. The consideration that their mine prospect was mainly weighted towards the Heavy Rare Earths (HREE) meant that this sub-group came to the fore of investor's attention, maybe inordinately so.

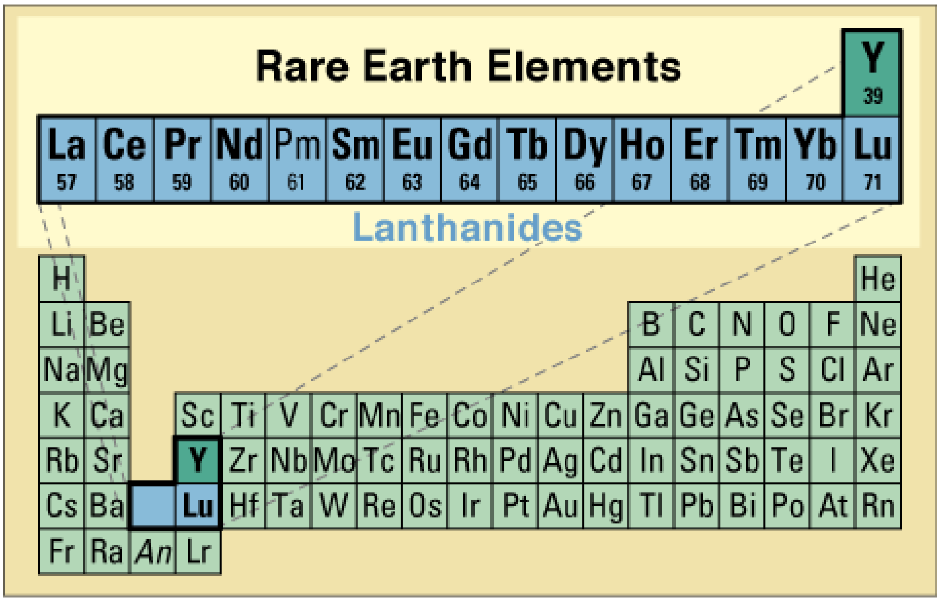
Enthusiasm amongst investors was admirable, but rather indiscriminate. The word "technology" has a special resonance for US investors and they charged at the REE space without really knowing what the technological issues were. Europium was being touted as something new when in fact it has been used in screens since colour television first debuted for the mass market. Avalon initially stirred up the excitement with talk of hybrid auto engine usage but investors then failed to grasp that it was Neodymium and Praseodymium, two of the Light Rare Earths (LREE) that are used in the engines of hybrid autos rather than the HREE.

The Chinese to their horror found that their attempts to push prices up in the space (and corral technological uses into their own industrial parks) resulted in the panic, heightened prices and, by some estimations, hundreds of new mining players in the space. This promised a severe undermining of the Chinese position of dominance. One thing was to encourage a couple of non-Chinese players with small market shares and quite another to permit a swarm of new entrants producing indiscriminately and stealing Chinese dominance. The revenge was swift with the Chinese lowering the prices in a brutal guillotining manoeuvre that sent the sector into a near-terminal tailspin.

Orientation on REE

The Wikipedia article on REE became a heavily trafficked site in mid-2009 when the investment community first got wind of China's shutdown of REE exports. REE was definitely not a well-known subject even in geological circles. Most mineral testing didn't bother to measure these grades, except in the case of some uranium operators who saw it as a potential by-product.

The Rare Earth elements (or rare earth metals) are a collection of seventeen chemical elements in the periodic table, namely Scandium, Yttrium, and the fifteen lanthanoids. Scandium and Yttrium are considered rare earths in some circles since they tend to occur in the same ore deposits as the lanthanoids and exhibit similar chemical properties.



The term "rare earth" arises from the rare earth minerals from which they were first isolated, which were uncommon oxide-type minerals (earths) found in Gadolinite extracted from one mine in the village of Ytterby, Sweden. The first REE were identified in the late 18th century. The expansion of science and enquiry during the Industrial Revolution filled out the range of metals that were categorized as Rare Earths.

In general the properties of the group are:

- Silvery-white metals that tarnish when exposed to air, thereby forming their oxides
- Burns easily in air; at elevated temperatures many rare earths ignite and burn vigorously
- Relatively soft metals; hardness increases with higher atomic numbers
- Many REE compounds fluoresce strongly under ultraviolet light
- Reacts with water to liberate hydrogen gas, slowly in cold/quickly upon heating
- Reacts with dilute acid to release hydrogen gas rapidly at room temperature
- Most REE compounds are strongly paramagnetic

- ❖ High melting and boiling points

The table below shows the metals and their prime applications at the current time.

	Symbol	Name	Usage
57	La	Lanthanum	High refractive index glass, flint, hydrogen storage, battery-electrode, camera lens
58	Ce	Cerium	chemical oxidising agent, polishing powder, yellow colors in glass and ceramics, catalyst for Self-cleaning oven etc.
59	Pr	Praseodymium	Rare-earth magnets, laser, green colors in glass and ceramics, flint
60	Nd	Neodymium	Rare-earth magnets, laser, violet colors in glass and ceramics, ceramic capacitor
61	Pm	Promethium	Nuclear battery
62	Sm	Samarium	Rare-earth magnets, Laser, neutron capture, maser
63	Eu	Europium	Red and blue phosphors, laser, mercury-vapor lamp
64	Gd	Gadolinium	Rare-earth magnets, high refractive index glass or garnets, laser, x-ray tube, computer memory, neutron capture
65	Tb	Terbium	Green phosphors, laser, fluorescent lamp
66	Dy	Dysprosium	Rare-earth magnets, laser,
67	Ho	Holmium	Laser
68	Er	Erbium	Laser, vanadium steel
69	Tm	Thulium	
70	Yb	Ytterbium	Infrared Laser, chemical reducing agent
71	Lu	Lutetium	

The Light Rare Earths have been largely referred to as those from Lanthanum to Samarium, with the Heavy Rare Earths being the rest.

The table of the Lanthanides above does not include the outlier Yttrium, which is the predominant REE at Round Top. The most important use of yttrium is in making phosphors, such as the red ones used in television set cathode ray tube (CRT) displays and in LEDs. It is also used in the production of electrodes, electrolytes, electronic filters, lasers and superconductors; various medical applications; and the tracing of various materials to enhance their properties. Yttrium metal has found some use alloyed in small amounts with other metals and is used to increase the strength of aluminium and magnesium alloys. When added to cast iron it makes the metal more workable. Although metals are generally very good at conducting heat, there is an alloy of Yttrium with chromium and aluminium which is heat resistant. Yttrium oxide in glass makes it heat- and shock-resistant, and is used for camera lenses. Yttrium oxide is suitable to making superconductors, which are metal oxides which conduct electricity without any loss of energy.

Strategically speaking, Yttrium has high-tech and defense uses including being used as a stabilizer and mold former for exotic light-weight jet engine turbines and other parts, and as a stabilizer material in rocket nose cones. Yttrium, as well as many other Lanthanides, can also be formed into laser crystals specific to spectral characteristics for military communications

The principal sources of rare earth elements are the minerals bastnäsite, monazite, and loparite and the lateritic ion-adsorption clays. Despite their high relative abundance, rare earth minerals are more difficult to mine and extract than equivalent sources of transition metals (due in part to their similar chemical properties), making the rare earth elements relatively expensive. Their industrial use was very limited until efficient separation techniques were developed, such as ion exchange, fractional crystallization and liquid-liquid extraction during the late 1950s and early 1960s.

Home Truths

The already well-documented fact is that Rare Earths aren't rare, or at least Cerium the main component of the Lanthanide Series is not rare. With the exception of the highly-unstable promethium, rare earth elements are found in relatively high concentrations in the earth's crust, with cerium being the 25th most abundant element in the earth's crust at 68 parts per million. In fact there is more Cerium in the Earth's crust than there is copper. We would concede though that it does not appear in the same concentrations as copper does.

Once one gets beyond the basic reality check comes the more nuanced complications of REE. Chief amongst these are that:

- Heavy rare earths (HREE) may attract a better price than most of the other metals in the group but they appear in such small quantities that the amount extracted is very small for the amount mined.
- The real business is in the downstream processing
- Many of the wannabes in the industry in the REE space have uranium and/or thorium to deal with in their mix
- Many of the projects are years away from production
- Many of the promoters were fakers, not committed to production but mouthing the words and talking of feasibility studies when they were only relying on the Greater Fool theory and someone acquiring them

Dealing with each of these issues we would note that the HREE issue is a serious one. Even the best of HREE prospects consist of deposits where the sexiest HREE (Europium and Lutetium) appear in such small quantities (measured in double digit parts per million – ppm) in the metal mix that the amount extracted is very small for the amount mined. Obviously processing costs are much higher per ounce of Europium than per ounce of Cerium. Some marketers led with their price tables and left commercial reality behind. They looked at a flat-screen TV and started salivating because they claimed that Europium is a component and that it is selling for around $830 per kg. Indubitably true, but the Eu input to any television is minimal, or else recycling of old cathode ray tubes for their Eu content would be a viable enterprise.

Thus HREE prices are good but the grades, even in the best of prospects, are so low for the highest priced REE elements that no-one could even vaguely hope to start a mine based upon Europium grades alone. It is the total mix that matters.

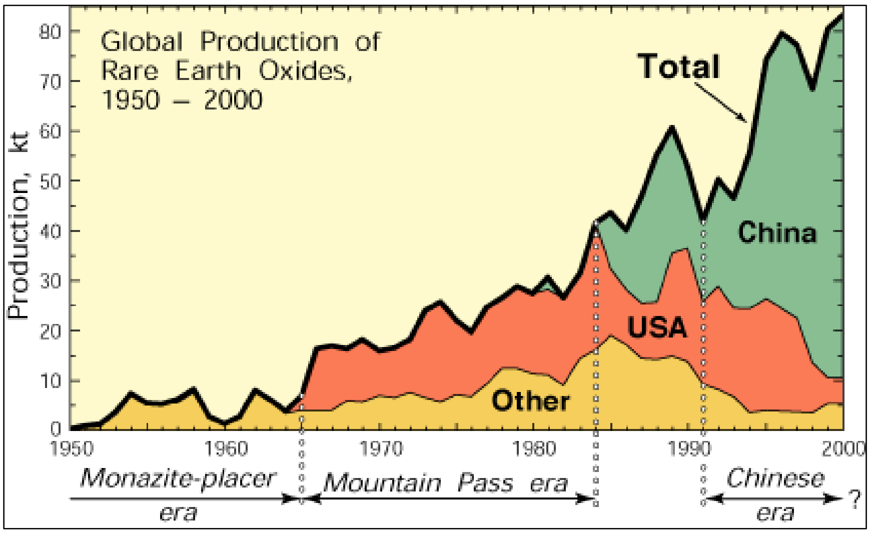
We would also note that most producers do not talk about Yttrium (TRER's strength) because they don't have any. Some 41% of TRER's REE mix is this non-Lanthanide REE. This is a unique market niche and incomparable to the other mainstream Rare Earth wannabes.

This leads us then to the processing. At the moment ore is mined and concentrated at or near the mines but the biggest value-added in the process is at the quasi-manufacturing phase. This is a phase which Molycorp/Neomaterials, Medallion Resources (potentially) and Great Western are exposed to but which the other explorers are not. Most of the budgets we have seen talk of capex costs of US$200mn plus for the concentrating and separating process, largely at the mine. This leaves us wondering whether if prices go up significantly then miners might be best to get their mines going and sell ore to on-processors who would bear (or have borne already) the heaviest part of the capex.

It is clear now that the race in REE is not necessarily going to those with the best grades but to those mines that are up and running first. A few sizeable mines reaching production around the world would make the going tougher for latecomers. We have already seen several front-runners fall out of contention due to their failure to make the jump to the mine-build phase.

Evolution of dominance

The chart below pretty much tells the history of REE mining in recent times. As the REE group did not have much commercial application until recent decades the mining was sporadic and scarcely profitable. From the late 19th century until the rise of the US as a producer the main source of those REE in greatest use was Brazil where monazite sands were the source from which it was extracted. To show how low-tech REE applications were for a long time the main use of the elements was employing them mainly in refractory materials of which the main one was ceramic "candles/mantles" for old-fashioned gas heating devices. Most of the other REE had little work done on them until the rising wave of new technologies started to appear in recent decades.



Source: USGS

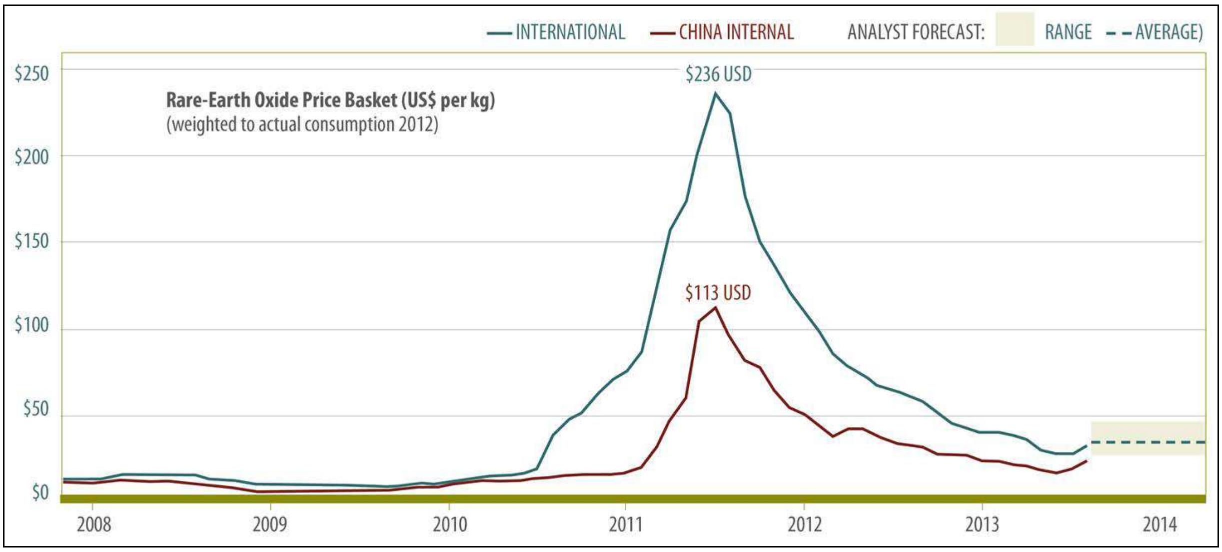
The era of US dominance is described as the Mountain Pass Era that pretty much sums up the total dominance that this mine had over US production. While the chart shows this mine starting up in the mid-1960s, it actually came into production in 1952. It is clear that it also made up to 40% of global production during that period. It was owned for much of that time by Union Oil Co (later Unocal) and this eventually was taken over by Chevron.

The eclipse began from the mid-1980s when China effectively undercut the prices of most other producers and sent production spiraling down around the world to the current state of affairs. The Steenkampskraal mine in South Africa was shut down decades ago and the Mountain Pass operation was mothballed in 2002. Ex-CIS mines mainly in Kyrgyzistan, Estonia and the Kola Peninsula in Russia shut after the breakdown of the old Soviet empire. The ongoing non-Chinese output was from sands in India and some desultory production from the Brazilian national nuclear authority. At times in the more distant past, Sweden and Finland had been small producers. Of relevance to TRER specifically is that there is Yttrium production outside China which takes place in Malaysia as a by-product of tin mining.

Most reports put the Chinese market share in REE at 93% at the current time but we have seen some reports of 97%.

Pricing trends – the REE Universe

The price surge and then plunge is even better documented by the chart below:



Source: Metal Pages/IMCOA

Prices certainly haven't helped and as the table below shows the current spot prices are almost all trading at below the long-term average price. Our outlook for 2016 is included.

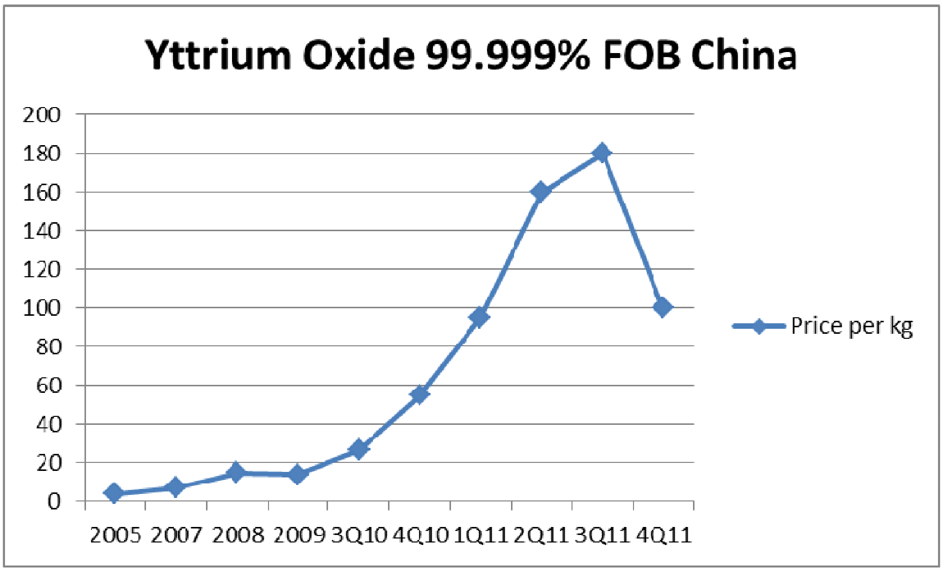
Price Deck	Toyota 2016	Spot Jul-13	Av. Long-Term	Hallgarten 2016
Lanthanum	10.00	6.75	8.14	6.00
Cerium	5.00	6.75	5.81	6.00
Praesodymium	75.00	78.50	71.93	90.00
Neodymium	75.00	53.50	74.64	92.00
Samarium	9.00	9.00	9.33	11.00
Europium	500.00	825.00	956.41	760.00
Gadolinium	30.00	46.50	30.64	30.00
Terbium	1600.00	705.00	1213.14	1250.00
Dysprosium	750.00	475.00	684.35	830.00
Yttrium	20.00	18.50	29.25	32.00

Source: Medallion Resources/Hallgarten

We remain bullish though on virtually all the Rare Earths, except the ubiquitous Lanthanum and Cerium. These two really spoil the mix and the onset of production from Molycorp and Lynas, which are both biased to these two elements, has made the price appreciation prospects for them look grim and put the lid on any and all projects that are overly weighted towards these “mass-market” metals.

The Value of Yttrium

The largest component in the Yttrioflourite mix (which is TRER’s prime mineralisation) is Yttrium so its fortunes will dictate the viability of any project using this mineral. The chart below (compiled by us from information from IMCOA/Metal Pages) shows the exponential growth in the Yttrium price in the last few years. In the middle of the last decade the metal was almost a giveaway at a mere $4 per kg but at one point in 2011 the oxide was going for $180 per kg. Prices in 2012 have fluctuated between a low of $90 to a high of $130 with the current price, according to Metals Pages being around $100, FOB China.



More than any other REE, we see the strongest potential in Y for the Western producers to take significant market share away from the Chinese. This would be via a combination of the existing "outside China" share of the Malaysians and the onset of serious volume output from the Round Top property.

IMCOA estimates that the annual demand for Yttrium Oxide in 2016 (with a 20% margin of error either way) would be 13,350 tpa while the supply would be 10,000 tpa, implying a meaningful deficit.

Lithium – another technology metal by-product

We should mention in passing that the Lithium aspect of this deposit remains essentially untapped. TRER never assayed for lithium so it was not included in the resource estimate. They did, however, do some work which yielded approximate recovery rates and from this the company came up with estimated annual production.

- Potential Li Carbonate: 9,000 tpa
- Using Lithium Carbonate: $5500/ton
- USGS 2012 World Mine Production Estimate: Lithium Carbonate: 37,000 tpa

The Phase IV study for acid in the heap leach showed a 58.5% Li recovery over 60 days.

There are no cost estimates for the production of this element but it is felt that these should be fairly low. The most relevant point is that it is recoverable and potentially a meaningful source of Lithium for those who desire a domestic secure supply.

Fluorite – The Road Less Travelled

Fluorspar hardly gets a mention in mining circles despite its economic importance and the grip that China has had on supplies in recent years. Our previous interaction with mineral was in relation to some rather unique REE deposits in New Mexico that occurred in concurrence with Fluorspar and in our coverage of Canada Fluorspar (CFI.v) in 2013. However, Fluorspar is ranked fifth in the United States' list of foreign source-reliant minerals and included in the European Union's list of 14 critical minerals.

Applications

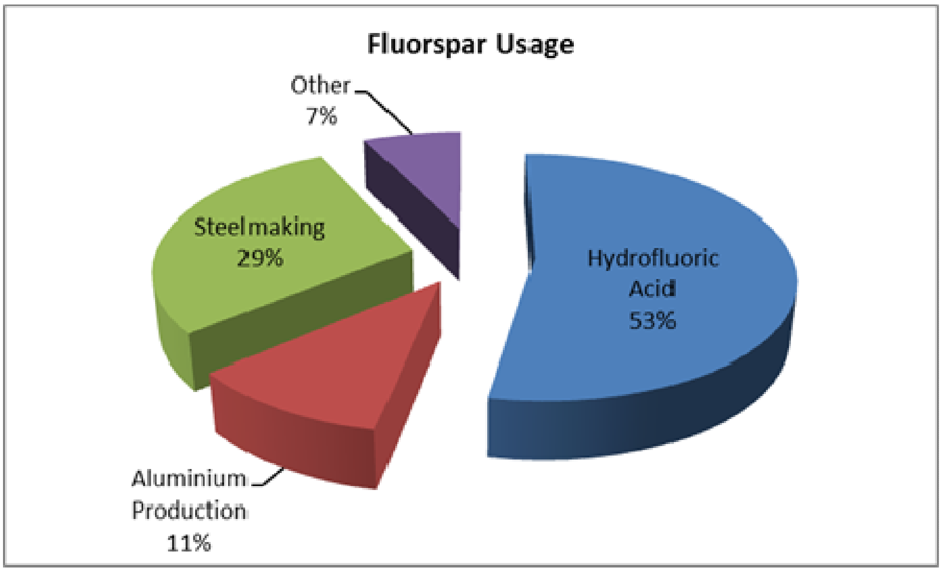
Calcium fluoride (CaF2) comes in three industrial grades:

- Acid grade (>97% CaF2)
- Ceramic grade (93-97% CaF2)
- Metallurgical grade (60-93% CaF2).

Calcium fluoride is a vital component in several industrial applications, including steel production. It is also used to make hydrogen fluoride (HF) which, in turn, is used in the production of refrigerants and to make: aluminium tri-fluoride (AlF_3), critical in aluminium smelting; uranium fluoride (UF_6), used in nuclear power stations; and lithium hexafluorophosphate ($LiPF_6$), used to make lithium batteries. tri-fluoride used in the manufacture of various downstream products, which are then re-imported at high cost.

Fluorspar is used in the production of hydrofluoric acid, which is the primary feedstock for the manufacture of virtually all organic and inorganic fluorine-containing compounds including fluoropolymers and fluorocarbons. Some examples are anaesthetics, non-stick coatings, and fire retardant clothing. It is also used in the production of electronic components, aluminum, and steel. Fluorspar-linked products are used in refrigeration, ceramics, chemicals, dental products and pharmaceuticals, as well as nuclear physics.

Fluorspar is not without its alternatives/substitutes. Aluminum smelting dross, borax, calcium chloride, iron oxides, manganese ore, silica sand, and titanium dioxide have been used as substitutes for fluorspar fluxes in the steel industry while the by-product fluorosilicic acid has been used as a substitute in aluminum fluoride production and also has the potential to be used as a substitute in HF production.



Geology

Fluorite occurs in a wide range of geological environments. The most commercially important deposit types include: hydrothermal veins and stockworks associated with felsic igneous rocks; stratiform replacement deposits in carbonate rocks; skarns and other contact metamorphic rocks; at the margin of carbonatite and alkali igneous rock complexes; and residual deposits in the regolith. Fluorite also occurs as a gangue mineral in some base metal deposits (e.g. Mississippi Valley type deposits). These consist of veins or replacement bodies and cavity fillings of fluorite, carbonates, quartz and silver–lead–zinc mineralisation in carbonate sequences. Other deposit types (for fluorine) of lesser economic significance include pegmatites and lacustrine sedimentary deposits (e.g. Piancino in Italy).

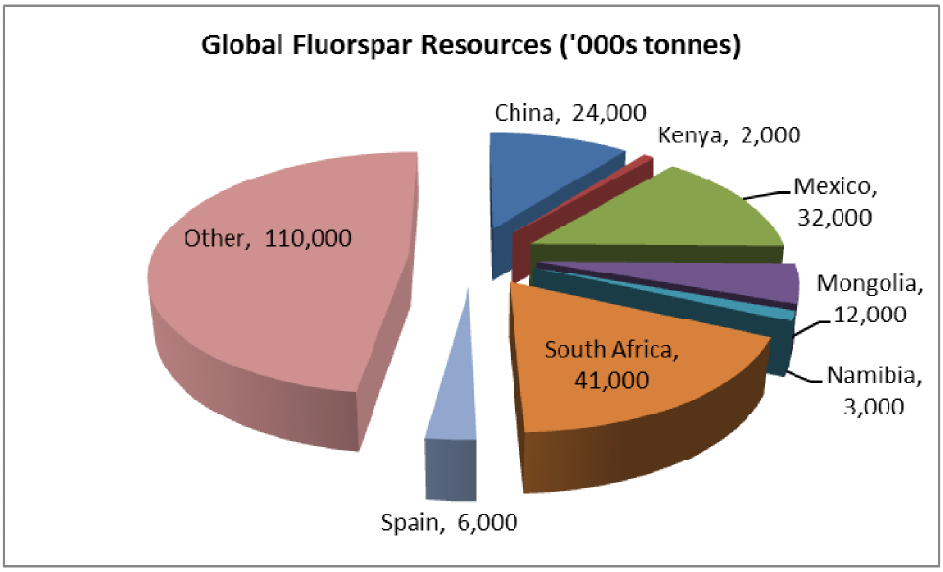
Fluorite may occur as a vein deposit, especially with metallic minerals, where it often forms a part of the gangue (the surrounding "host-rock" in which valuable minerals occur) and may be associated with galena, sphalerite, barite, quartz, and calcite. It is a common mineral in deposits of hydrothermal origin and has been noted as a primary mineral in granites and other igneous rocks and as a common minor constituent of dolostone and limestone.

Global Resources

Fluorite is a widely occurring mineral which is frequently found in large deposits. Notable deposits occur in China, Germany, Austria, Switzerland, England, Norway, Mexico, and both the Province of Ontario and Newfoundland and Labrador in Canada. Large deposits also occur in Kenya in the Kerio Valley area within the Great Rift Valley. South Africa hosts the largest reserves of fluorspar at 41-million tons, followed by Mexico with 32-million tons and China with 21-million tons.

In the United States, deposits are found in Missouri, Oklahoma, Illinois, Kentucky, Colorado, New Mexico, Arizona, Ohio, New Hampshire, New York, Alaska, and Texas. Illinois was the largest producer of fluorite in the United States, but the last fluorite mine in Illinois was closed in 1995.

The table below shows the USGS' current view of where the major Fluorite resources are distributed. The USGS has noted that identified world fluorspar resources were approximately 500 million tons of contained fluorspar. The quantity of fluorine present in phosphate rock deposits is enormous.



Source: USGS

There is not a shortage of Fluorspar resources, only a shortage of production, in the Western world at this time. However as we all know the mining capital markets are tough going even for well-known commodities let alone that of obscure elements such as Fluorspar. The key component in any plan has to be securing an off-taker arrangement.

Production

The international market consumes approximately 5-6 million tonnes of Fluorspar per annum with an estimated value of US$1.6 billion to US$2.3bn.

South Africa was the leading producer with, in 2010, some 280,000 tonnes produced. Development work by a firm called Hastie Mining resulted in the new U.S. fluorspar mine at Burna in western Kentucky. This facility began production in the second half of 2010 and has capacity to produce about 50,000 tons of fluorspar per year.

The two listed Fluorspar plays are Prima Fluorspar (PF.v) and the aforementioned Canada Fluorspar.

Flourite - Annual Production					
'000 tpa					
	2007	2008	2009	2010	2011e
China	3200	3250	2900	3300	3300
Mexico	933	1060	1040	1070	1070
Mongolia	380	380	460	420	420
Russia	180	269	240	250	250
South Africa	285	316	204	200	270
Spain	150	149	140	135	140
Namibia	118	109	64	95	100
Kenya	82	98	16	45	115
Morocco	90	61	75	75	90
Other Countries	270	350	180	420	445
Total	5690	6040	5460	6010	6200

Sources: USGS, Fluorspar 2007-2010 and 2011 (e=estimated)

China doing that thing it does

The Chinese government closely controls the total fluorite production through licensing requirements and production limitations. China has been the world's leading producer over the last 20 years. The availability of Chinese material on the international market has decreased significantly over the past five years. The reasons for flat production in China might be its policies on export quotas and tariffs combining with rapidly increasing domestic demand.

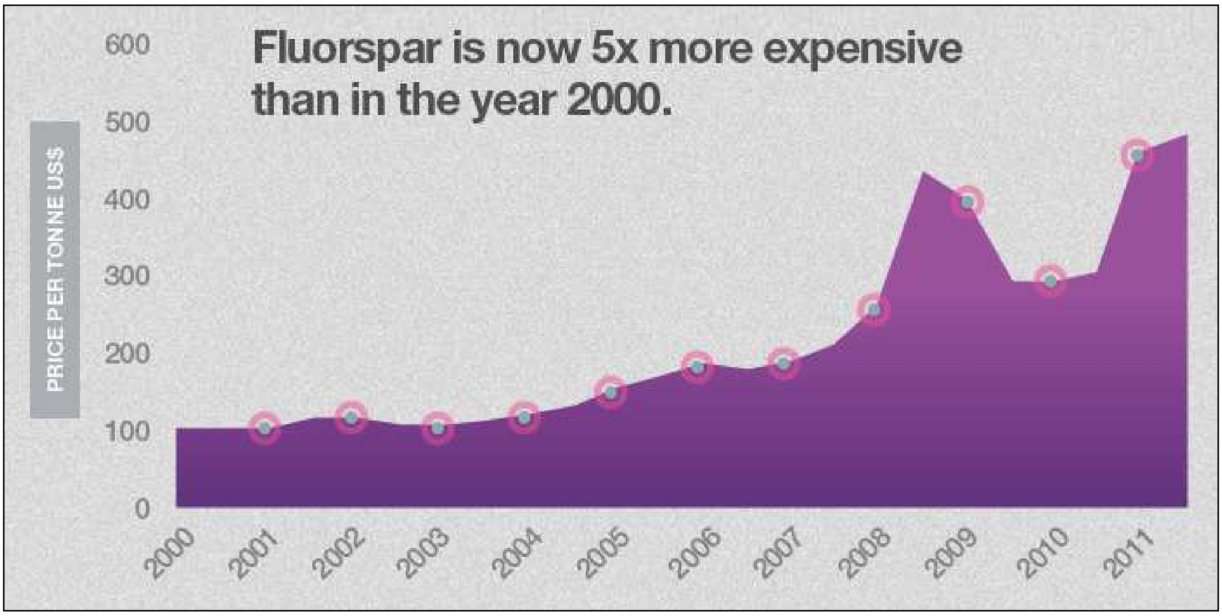
Repeating in more gradual form than we have seen in REE, the Chinese started tightening exports a fair while back (in 2003) and, in the meantime, Western end-users were the frogs in the boiling water.

The Chinese measures have been is interpreted as a move towards production quotas (control at source) rather than export quotas (control along the value chain). The WTO dispute settlement panel found in July 2011 that China's export duties and export quotas were inconsistent with WTO rules. The ruling stated, "China's actions were not justified as conservation measures, environmental protection measures, or short supply measures".

It has been noted though that China has been producing about its theoretical share of the global resources meaning, as with so many things, it has squandered a potentially scarce asset while those it forced out of the market still have their resources relatively undepleted. This augurs for less Chinese influence on the market (from the supply-side at least) in the coming decades.

Price trends

The chart below show that fluorite's market price went up over 192% between 2009 and 2011. Prices have since retreated to around $380 per tonne in the second half of 2013.



Source: Visual Capitalist

Beryllium

Beryllium is the chemical element with the symbol Be and atomic number 4. It is a relatively rare element in both the universe and in the crust of the Earth. It is a divalent element which occurs naturally only in combination with other elements in minerals. As a free element it is a steel-gray, strong, lightweight and brittle alkaline earth metal.

Beryllium increases hardness and resistance to corrosion when alloyed with aluminium, cobalt, copper (notably beryllium copper), iron and nickel. In structural applications, high flexural rigidity, thermal stability, thermal conductivity and low density (1.85 times that of water) make beryllium a quality aerospace material for high-speed aircraft, missiles, spacecraft, and communication satellites. Because of its low density and atomic mass, beryllium is relatively transparent to X-rays and other forms of ionizing radiation; therefore, it is the most common window material for X-ray equipment and in particle physics experiments. The high thermal conductivities of beryllium and beryllium oxide have led to their use in heat transport and heat sinking applications.

The United States is the world's leading source of beryllium. The Spor Mountain mine in Utah produced more than 85% of the 230 tpa of beryllium mined worldwide. Materion (MTRN:NYSE), the owner of that mine, is thought to mine 1% BeO ore at Spor Mountain (and reports 75 years of reserves at current mining rate). China produced most of the remainder, and less than 2% came from Mozambique and other countries.

National stockpiles also provide significant amounts of beryllium for processing. Three countries (China, Kazakhstan, and the United States) process beryllium ore. In 2005, the U.S. Department of Defense began a partnership with Materion to build a new processing facility in Ohio to produce high-purity beryllium metal. The processing facility was completed in 2011, and up to two-thirds of its output was to be allocated for defense and other government-related end uses. The United States imported approximately 34% of the beryllium raw materials it used in 2011, including beryllium metal and other processed beryllium materials used in manufacturing; two-thirds of this material came from Russia and Kazakhstan. This is clearly a less than ideal situation and makes a potential captive market for Be output from Round Top and gives the project national strategic importance.

The trend (at least up until 2010) reported by the USGS indicated strong demand. In the first half of 2010, Materion reported a 62% increase in shipments of bulk beryllium-copper alloy products, compared to the first half of 2009. Beryllium product sales in the key markets of aerospace, automotive electronics, ceramics, computers and telecommunications were substantially higher than the previous year. Recently though the demand has levelled off with sale revenues essentially flat from 2010 to 2012.

Pricing is usually set between the mine and the production facility based on the usual factors of supply and demand. Increased demand led to increasing prices for beryllium over the last decade. Based on the beryllium content in imported beryllium-copper master alloy, an alloy for which there is a reliable reported price, the USGS estimated the average annual price per pound of contained beryllium was US$230 per pound in 2010, up from US$154 in 2009.

Average annual unit value of contained beryllium in beryllium-copper master alloy US$/lb

2006	2007	2008	2009	2010
$128	$144	$159	$154	$230

Source: U.S. Geological Survey, Mineral Commodity Summaries, January 2011

Total world reserves of beryllium ore are estimated to be greater than 400,000 tonnes.

The current situation at Round Top is the efforts of Cabot and Cyprus left not only a data-set on the deposit but also physical infrastructure in the form of a “starter mine” (still usable and pictured below) consisting of a 867 ft long, 10ft x 10ft decline with vent fan & services in place.

The Cyprus mine plan dating from

1988 is in the possession of TRER. Round Top represents a high grade mineralization – 300,000 tons at 2% BeO (non NI43-101 compliant). The latest PEA envisages 36 tpa of BeO production. This would represent 7.4% of global production. Before one dismisses the relative puny size of this production one should note that the metal is currently trading of the Shanghai Metals Exchange at $374,000 per tonne.

Beryllium represents an interesting Phase Two (or Three) exercise for TRER.

Management

The company's President and CEO is Anthony Marchese, who has served as a director since December 2009. Since May 2012, he has also been the managing director of capital markets at Tri Point Global Equities. He had served as a Senior Vice-President with Axiom Capital Management, Inc., a New York City broker/dealer. He also serves as the general partner and chief investment officer of the Insiders Trend Fund, LP, an investment partnership. His prior experience includes Monarch Capital Group, LLC (President and Chief Operating Officer – 2003 to 2011), Laidlaw Equities (senior vice president - April 1997 to March 2002), Southcoast Capital (senior vice president – May 1988 to April 1997), Oppenheimer & Co (limited partner – September 1982 to May 1988), Prudential-Bache (vice president – July 1981 to August 1982) and the General Motors Corporation (analyst – June 1980 to June 1981). He served in the military with the Army Security Agency and the U.S. Army Intelligence and Security Command. He received an MBA in Finance from the University of Chicago.

Daniel Gorski was appointed as chief executive officer as of July 2012 and has served as a director since January 2006, as well as chief operating officer until January 2012. Prior to this, he served as the TRER's president and chief executive officer from January 2007 to May 2011. From July 2004 to January 2006, he was the co-founder and vice president of operations for High Plains Uranium, Inc., a uranium exploration and development company that went public on the Toronto Stock Exchange in December 2005. Between June 1996 to May 2004, he served as an officer and director of Metalline Mining Co., with holdings in the Sierra Mojada Mining District, Coahuila, Mexico. From January 1992 to June 1996, he was the exploration geologist under contract to USMX Inc. in Latin America. He earned a B.S. in 1960 from Sul Ross State College in Alpine, Texas, and an M.A. in 1970 from the University of Texas in Austin, Texas.

James Wolfe is a director (and serves on the compensation and corporate governance and nominating committees). As co-founder of Pacific Materials Resources, Inc. (PMR), he was among the pioneers of the China-U.S. REE industry and trade (interfacing between the major REE producers in China and a broad spectrum of REE consumers in the US). Prior to founding PMR, he was President of MPV Lanthanides, Inc., a REE joint venture between China Metallurgical Import/Export of Inner Mongolia and U.S. interests. From 1979 to 1995, his focus was on resource recovery from industrial and mining wastes. He served as a consultant to the steel industry, co-founded Exmet Corporation (zinc from smelter dust), and served as executive vice president of Williams Strategic Metals, Inc., and its predecessor, Nedlog Technology Group, Inc. He developed and implemented projects for the recovery of cobalt from slags, indium from smelter dusts, and rare earths from mine tailings. In 1970, while he was employed by the Lawrence Livermore Laboratory, he invented and patented a plasma method for producing ultra-fine refractory metal carbides. He co-founded Cal-Met Industries, Inc., in 1973 to commercialize the plasma technology. He received a B.S. and an M.S. in metallurgical engineering from the University of Washington and a Ph.D. from the University of Missouri-Rolla.

The only board of a REE company that Jack Lifton serves on is that of TRER. He is a noted consultant, author and lecturer on the markets for non-ferrous strategic metals. He has more than 51 years of experience in the global OEM automotive, heavy equipment, electrical and electronic, mining, smelting, and refining industries. His background includes the sourcing, manufacturing and sales of platinum group metals and products, REE-based technologies, including rare earth permanent magnets, batteries, sensors, phosphors and ceramic specialties used to make catalytic converters. He is a Co-Founder of Technology Metals Research LLC and a Senior Fellow of the Institute for the Analysis of Global Security. He was educated as a physical chemist, specializing in high-temperature metallurgy and was "present at the creation" of many consumer technologies based on amorphous semiconduction, such as the recordable DVD and the SSD memory, and on the enabling properties of the rare earths that led to both the nickel metal hydride battery and the mass produced rare earth permanent magnet.

Cecil Wall is a director (and serves on the audit and compensation committees). In 1969, he acquired control of a publicly traded company, Altex Oil Co. (formerly known as Mountain Valley Uranium). Under his leadership, Altex established a 20,000-acre position in what became the Greater Altamont Field at Altamont, Utah. He sold his interest in Altex in 1985. He was part of the founding group for the 2007 reorganization of Standard Silver Corp. (TRER's predecessor). He sat on the Company's board of directors and served as the secretary and treasurer from January 2004 to April 2012. He is currently the manager for C-Wall Investment Company, LLC, in Utah. In addition, he is the president of several family-owned private companies. He attended Carbon County College and Utah State University.

Laura Lynch is a director (and serves on the compensation and corporate governance and nominating committees). She previously served as the Executive Assistant to the Vice President of Public Affairs at U.T. Southwestern Medical Center in Dallas, Texas. She has been on the TRER team since early 2011.

Dr. Nicholas Pingitore was appointed as a director in July 2012, (and serves on the audit and corporate governance and nominating committees). Since 1977, he has held a full-time faculty appointment at UTEP. In addition to being a Texas Licensed Geoscientist, Dr. Pingitore is a member of several professional associations including the American Chemical Society, Geochemical Society, American Association for the Advancement of Science, American Geophysical Union, Materials Research Society, and Mineralogical Society of America. He has served for 25 years as director of UTEP's electron microprobe laboratory. He holds an A.B. degree from Columbia College and a MSc and a Ph.D. in geology from Brown University.

The Advisory Board

In the world of Rare Earth stocks the advisory board has taken on an uncommon importance with trophy hunting to collect together the biggest pool of "gurus" that one can muster. In addition to Jack Lifton and Nicholas Pingitore on the main board, the rest of the line-up of TRER's "dream-team" is:

- Charles "Chip" Groat, Ph.D., is currently the President and CEO of The Water Institute of the Gulf
- Daniel McGroarty, principal of the non-profit American Resource Policy Network, an experts-led resource development think tank
- Dr. Philip Goodell is currently an associate professor of geology at the University of Texas at El Paso (UTEP)

- James Hedrick is an independent geologic consultant to the mining industry, investment groups, media, and the government. He retired from his position as the rare-earth commodity specialist at the U.S. Geological Survey in 2010 after nearly 32 years of U.S. Government service.

Risks

The potential pitfalls with the Round Top project are few, but merit mentioning:

- That the REE space fails to recover
- That financing for the next stage (feasibility) proves difficult to obtain
- That an offtaker, for one or more of the metals in the project mix, is not brought on board
- Environmental concerns raise their head

At least as far as the first risk is concerned we would hope that this note has shown that the many strands of this project mean that it can be potentially turned in a number of directions, almost irrespective of the state of the broader REE market because its strong weighting towards Yttrium (with its less competitive space) and the plethora of by-products mean that the direction the project is heading can be manoeuvred to target the healthiest of its metals at any given time.

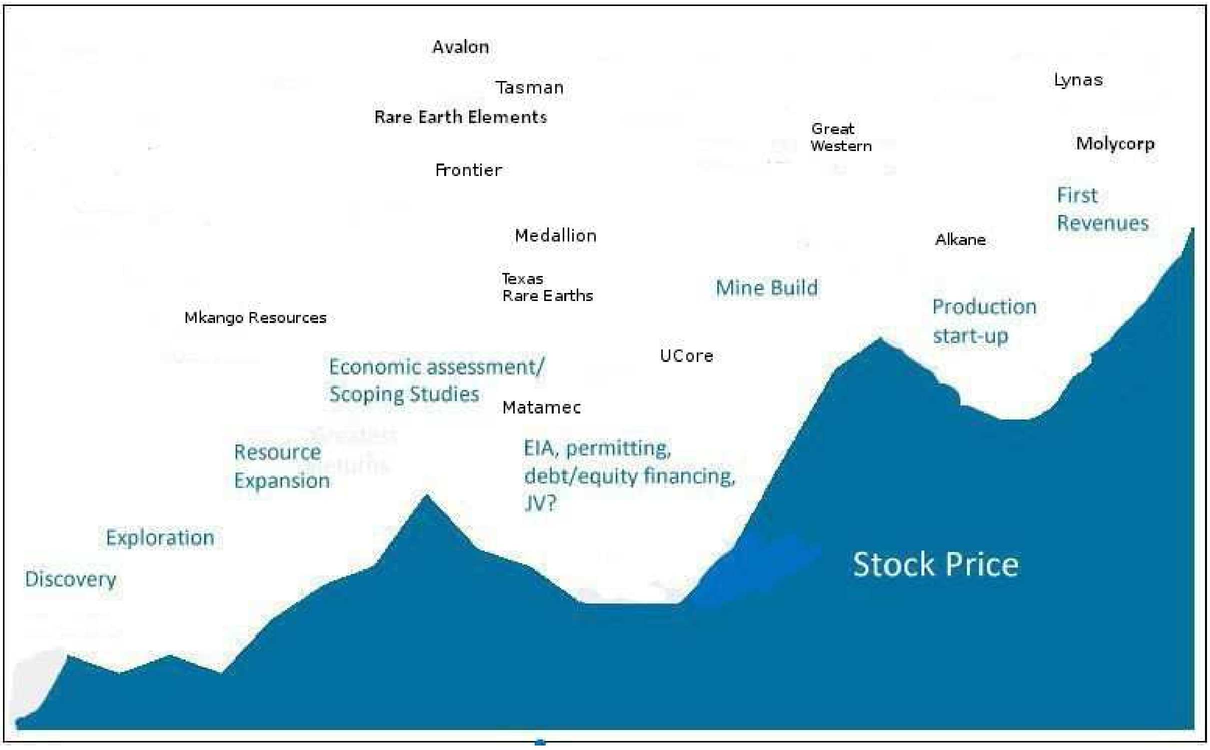
Financing seems to be improving but the evidence is not clear if this will extend to the REE space. Hence the attractions of marketing this project as a poly-(special)-metallic project.

Offtakers will find that this is the ONLY substantial Yttrium mining project out there and as such if they want the product they will have to talk to TRER, otherwise they are at the mercy of the Chinese (and to a far lesser extent the Malaysians).

Texas has been one of the most trouble-free areas of the US for permitting, including for uranium-mining permitting. While this is not envisaged as a uranium mine, it is a part of the mix and as such one must be cognizant that this could occasion delays in permitting or involve costs in mitigating potential risks of radioactive spills or later contamination. Then again the uranium component could be a by-product stream that might attract funding from a major or an offtaker in that space.

The REE Lifecycle

Frankly the once populated left-side of this diagram does not interest us and those wannabes that used to rhapsodize about their eudialytes, bastnasites and andesites have now been cast into the outer darkness. Investors are not interested, for the simple reason that if even half of the names shown on the chart make it to production then there will be NO NEED for any juniors to follow in their wake for a decade or two. It would be too cruel of us to name names on which of them will be horses that fall on the final straight and need to be put down, but after our previous reference to bloated capex it doesn't take much for REE watchers to work out which ones they are.



The rest though are interesting because time has created a dispersal of focus. What was once largely an exercise in *Where's Wally,* with hundreds (maybe) of lookalike companies with lookalike deposits pleading for attention, has become a far smaller group differentiated by strategy, location, mineralisation style and backers/supporters.

Financing and Partners

In the second half of 2013, the NY boutique investment bank, KLR Group was mandated to assist TRER in its financing strategies. The company has revealed publicly that it has been approached by a number of potential strategic partners both domestically and internationally. It has also been approached by the Chinese. With the high proportion of management ownership it is no surprise that the company's executives have stated on numerous occasions that they have no interest in equity financing at the current depressed market valuations.

Shareholders & Price Trends

TRER is "rare" in the REE industry in having such a closely held register with 38% held by insiders. With so many REE stocks spawned by promoters there is very little in the way of the footprints of the originators of many of these deals upon the companies they set forth upon the stormy seas in 2010-2011. The company has about 700 shareholders, with the insider position owned by eight board members and three executive officers (two of whom are also board members).

In TRER's case the management has put their money where their mouth is and therefore has a justified aversion to dilutive financings. In recent times the company has had around $2mn in cash on board so with a low burn rate it can hold out for a good financing offer (which in its interpretation is the entry of a strategic end-user investor).

The most recent presentation states that, besides the 38% in the hands of insiders, there was 9% in institutional hands. This may indeed be out of date for the prolonged weakness of the stock since late last year has been due to the liquidation by Libra Advisors, the NY mining hedge fund, of its substantial position in TRER as the fund converts itself from a public-facing fund into a family office-like structure. In November 2013, Libra reported ownership of 890,433 shares, equal to 2.4% of the company whereas at the end of 2012 Libra reported holding around 3.6 million shares of the company. Management at TRER thinks that the residual stake at this point is around 300-400,000 shares, implying that the end is in sight to this weight upon the stock price.

Conclusion

The Round Top deposit appears to be a wonder of nature. It started out as a beryllium prospect, then uranium was found, it then moved to be a Rare Earth deposit but the devil is in the details and it turns out to be really an Yttrium deposit with very sizeable Fluorite credits. And that is before we consider the substantial Tin and Niobium resources. Indeed Round Top can be said to have “something for (nearly) everyone” in the specialty metals universe.

With so much to choose from where does one start? It’s easy to get caught up in the fad of the moment when one has such a deposit. It is undoubtedly a very substantial resource. The things that resonate most with us though are the Yttrium and Fluorite components. We have written about both previously in the context of different companies (but these other companies did not have both of the elements). In the task of differentiating itself from the rank and file of Rare Earthers, TRER has the advantage of being the only Yttroflourite deposit we have come across. If it concentrated solely on those two metals it would have a unique selling point that the other Yttrium- and by-product-poor REE wannabes do not possess.

The outlook for Yttrium is promising and the current price is good. Processing appears to be straightforward. By-product credits (from Fluorite) should juice up the returns. Its military and aerospace usages make it a “must have” element for the US economy (so the strategic card can be played). Texas is mining friendly and the deposit is very isolated from population centres and watercourses.

Rejigging the mine plan is a work in progress. It has been admirably downscaled by 75% with significant capex savings. We suspect another intermediate phase of a Yttrium/Fluorite circuit could be implemented to get into production faster and generate revenues to build out the other aspects. Round Top Mountain is a cat that can be skinned in many ways.

In light of that we are regarding Texas Rare Earths as a **Long** opportunity at this time with a twelve-month target price of USD$0.70.


TRER Daily
2/18/14
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
Volume
©BigCharts.com
1.5
1.0
0.5
0.0
Millions
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
14
Feb

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