TRER in the running to compete with Chinese ionic clay sources of heavy rare earths

The photograph on the left shows the result of actual "Cryolite-Enriched and Rare Metal-Bearing Rhyolite" mined from Round Top Mountain in Hudspeth County in Southwestern Texas being "lightly" crushed at the base of Round Top, by equipment in place at the site, for loading on existing rail serving the site.

The Round Top "Rhyolite" described above in a 1990 Geological Society of America (GSA) Special Paper by geologists of the Texas Bureau of Economic Geology at the University of Texas in Austin is the mineral deposit being developed by Texas Rare Earth Resources. It is comparable in "grade" to the Chinese ionic adsorption clays, and its distribution of rare earths is 72% heavy rare earths, just as are the best of the ionic clays.

Round Top Rhyolite differs from the Chinese "clays" in that the yttrofluorite, the xenotime analog mineral in which the rare earths are present, occurs as discrete fine particles within the rigid but highly porous rhyolite. This means that it requires only a simple room temperature dilute sulphuric acid irrigation to recover them rather than a wash with aqueous ammonium sulphate as is done with the Chinese "clays."

Another key difference between the clays and the yttrofluorite dispersion in rhyolite is that Round Top is a uniform mountain of the mineral. This allows a heap leaching type of extraction from the top of the mountain down. This will be done in stages with leach pads sited first below the summit and then as the

“mountain” is taken down the leach pads will be placed at lower and lower levels. It is estimated that at current target production the “mountain” will be leveled in about 130 years.

The Chinese “clays” are strip mined. An elevated section is leached and the “miners” then move on, because they have exhausted the recoverable materials usually in a single leach campaign. I have seen a Japanese video of an ionic clay reduced from a verdant hill to a barren one in 24 hours. After leaching the Round Top rhyolite looks essentially the same as it did prior to leaching. It does not disintegrate into an amorphous mass saturated with and holding active leach solution that will not drain.

Round Top’s rhyolite although tough breaks into tabular plates giving good surface exposure, and the silicate and cryolite do not mask the yttrofluorite. Thus a two-stage crush followed by a room temperature 5-7% sulphuric acid leach in the open recovers more than 80% of the total rare earths present.

Texas Rare Earth Resources plans to process the PLS obtained by the sulphuric acid leach directly by Continuous Ion Chromatography/Continuous Ion Exchange technology developed by K-Technologies of Lakeland, Florida. This technology allows the entire process to be done on site from removing unwanted elements to separating the rare earths from each other to purifying the rare earths to whatever degree the customer specifies.

CIC/CIX is ideally suited to the project’s mineralogy and hydrometallurgy and by eliminating the need for conventional large scale wet chemical preprocessing it looks to be more economical than conventional SX overall, since it eliminates the preprocessing and the long soak times needed by conventional SX. Further, CIC/CIX uses readily available resins and chelating agents produced in large volumes by several global chemical concerns and used worldwide.

TRER is thus very much in the running to compete with Chinese ionic clay sources of heavy rare earth earths in the global market over both in the short term and foreseeable future.