MIRACLE PROJECT PROPOSED EXPLORATION FOR OLYMPIC DAM-TYPE AND OTHER ORE DEPOSITS IN MISSOURI.

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DISCLAIMER:

'GRASSROOTS' exploration for ore deposits is risky and prone to failure. That is the nature of exploration in areas where geology is largely unknown, such as deep within Missouri's Precambrian rocks, and when using new exploration models. If the information were already known, the process would not be called 'exploration'.

On the plus side, successful exploration in new areas generally is very profitable for those who get in early and make the initial discoveries. Early and successful explorers usually get the lion's share of ore deposits and latecomers make due mainly with leftover scraps.

Keep this elevated risk level in mind if you decide to participate.

MIRACLE PROJECT ESTABLISHED EXPLORATION TARGETS:

The MIRACLE PROJECT in southeastern Missouri includes Olympic Dam-type, Cumulate-type and other exploration targets.

The primary Olympic Dam-type exploration target is a cluster of six individual targets arranged in a rough circle, that appear at this time to occur around and along a caldera collapse ring fault of a large Precambrian volcano, where the ring fault intersects a major linear fault. A secondary Olympic Dam-type exploration target is about ten miles farther down-trend. The secondary target is under cover of Paleozoic sedimentary rocks and less is known of this target's geology and mining potential.

The primary Cumulate exploration target is potentially quite large and lies at the intersection of a regional-scale fault and a gabbro intrusion. The upper level of magmatic differentiation is visible in a dike, indicating that accumulation of high-tonnage, ore-grade material may have formed at depth. There is at least one other Cumulate deposit in the area and may be several more.

WHAT IS AN OLYMPIC DAM-TYPE DEPOSIT?:

This is a category of ore deposit named after the super-giant Olympic Dam ore deposit in the State of South Australia. The following information is from U.S. Geological Survey Bulletin 1932, published in 1990, and titled The Mid-continent of the United States Permissive Terrane for an Olympic Dam-type Deposit? (available in printed form from the U.S. Geological Survey, Books and Open-File Reports, Federal Center, Box 25425, Denver, CO 80225, and free online at http://pubs.usgs.gov/bul/b1932/).

At time of publication, USGS Bulletin 1932 said the following: “The Olympic Dam (Roxby Downs) deposit in South Australia is one of the world’s largest ore deposits. Primarily a hydrothermal iron oxide deposit, its approximately 2 billion tons (tonnes (‘tonne’ = metric measurement = 1,000 kilograms)) of rock contain an estimated 32 million tonnes of copper, 1.2 million tonnes of uranium oxide, 1.2 million kg of gold, and significant concentrations of rare-earth elements (REE) and silver (Roberts and Hudson, 1983, Olympic Dam Marketing Pty. Ltd., 1987)". Since 1987, mining has removed some of that ore reserve and exploration and improved mining techniques have added to the ore reserve.

USGS Bulletin 32 continues, "The host rocks are multistage breccias (fractured rocks) that contain a large component of granitic and some possible felsic debris in a hydrothermal, iron oxide-dominated matrix."

"Hauck and Kendall (1984) and Meyer (1988) proposed that the Olympic Dam deposit can be considered as the type example of an Olympic Dam "class" of ore deposits characterized by iron-rich copper-gold-uranium-REE-phosphorus-fluorine ores in potassium-rich granites and equivalent porphyries. In their view, other deposits in this class include Kiruna (Sweden), Bayan Obo (Inner Mongolia), and Pea Ridge (Missouri)."

PROJECT STAGES:

A typical mining project has four stages:

1) Exploration and discovery: Find it.
2) Evaluation of discovery: Is it worth mining?
3) Production: Mine, process and sell the ore.
4) Closure: Shut down, clean up, and reclaim the land.

At startup the Miracle Project will begin Stage 1 - Exploration hopefully leading to discovery of one or more ore deposits, using the philosophy that one valid discovery is worth more than any number of failures. Initial exploration will concentrate on the best Olympic Dam-type and Magmatic Differentiation targets and work outward as money, resources and competition allow. Maybe we won't get everything, but we have a shot at getting the best. Trying to do too much too soon with too few resources is a recipe for failure.

CURRENT ACTIVITY:

In late February, 2014, the U.S. Geological Survey sent geophysical contractor CGG Canada Services Limited of Ottawa, Canada, to perform an aeromagnetic survey of 498 square miles in Washington, Franklin and Crawford Counties, Missouri, including the Pea Ridge mine, to help understand the geology and important concealed iron-oxide, copper, cobalt, gold and rare-earth elements deposits in the area. Known mineral/ore deposits including Bourbon, Kratz Spring, Camels Hump, Lower Pilot Knob and the Pea

Ridge mine are estimated to contain total aggregate reserves in excess of 1,000,000,000 (billion) tons of Iron. In addition there are more than 30 minor occurrences which have not been tested.

I do not know of mining company exploration in that area, although there may be some starting or under consideration. Mining companies are usually secretive concerning their exploration activities. Elected officials are aware of and enthusiastic about the area's exploration and mining potential, especially concerning possible discovery of important rare-earths ores and byproducts. Missouri State Senator Wayne Wallingford, State Representative Shelley Keeney, and former State Representative Jason Smith, who is now a Missouri U.S. Representative, all co-sponsored Missouri House Concurrent Resolution Number 32, 97th General Assembly and/or a nearly identical Resolution in the Previous General Assembly, supporting exploration and mining of rare-earth minerals in Missouri and local processing of the minerals in a rare-earths Refinery with secure storage of byproduct thorium in a Thorium Bank. Missouri U.S. Senator Roy Blunt is on board with the Rare-Earths Refinery and Thorium Bank. Senator Blunt introduced a Bill, the **National Rare Earth Cooperative Act of 2014** in support of exploration, mining and refining of rare-earths and other critical minerals and creation of a Thorium Bank for safe storage of byproduct thorium.

WHY RARE-EARTHS AND THORIUM?:

Rare-Earths elements are critical components of materials used to make high-tech devices such as hospital x-ray and MRI machines, smart phones, laptop computers, batteries, motors, generators, superconductors and magnets.

Thorium is a nuclear fuel. As existing uranium-fueled nuclear reactors wear out, many/most will be replaced by nuclear reactors using thorium fuel. Thorium fueled nuclear reactors for electric power generation are presently under construction in India and China.

Thorium-fueled reactors are much easier to operate than uranium-fueled reactors, offer important safety and anti-terrorism advantages, extract about 50% of the energy available in thorium fuel vs. about 1% to 3% of the energy available in uranium fuel, can burn and largely neutralize radioactive waste from uranium-fueled reactors as part of the thorium fuel mix, produce much less radioactive waste compared with uranium-fueled reactors, and produce radioactive waste that decays to a safe level of radioactivity in about 300 years vs. more than 10,000 years for uranium radioactive waste.

Most rare-earths are produced from the mineral Monazite, basically a cerium phosphate mineral that usually also contains other rare-earths and thorium. During refining rare-earths are separated from Monazite and from each other, with byproduct thorium remaining at the end of the separation process.

At this time, China has a monopoly on mining and refining of rare-earths and is not releasing rare earths into the world commodities market.

Companies in the United States and elsewhere that need rare-earths for high-tech manufacturing are forced to relocate to China and transfer their technology to China to obtain needed rare-earths. There is currently great need for diversifying sources of rare-earths so that the Chinese monopoly can be ended and high-tech manufacturing companies can operate in other parts of the world.

EXPLORATION TARGETS:

Legend Minerals' Miracle Project exploration area is target-rich, containing the following geological conditions that may host large and important ore deposits:

1) Olympic Dam-type: Pea Ridge and nearby Magnetite iron deposits are considered to be the 'roots' of Olympic Dam-type deposits from which overlying Olympic Dam-type mineralization has been removed by erosion. Going south from Pea Ridge, erosion cut less and less deeply into Precambrian rocks, so that if an Olympic Dam-type ore deposit ever existed in the Project exploration area the deposit was not destroyed by erosion and remains to be discovered. Expected primary mineral products include iron, copper, cobalt, nickel, gold, silver, rare-earths, uranium and thorium. Faulted and brecciated host structure and geochemistry are favorable for gemstones, especially topaz and amethyst, and for byproduct phosphorus (Apatite), fluorite and barite.

2) Magmatic Differentiation: Abundant groundwater likely present along the Grand River Tectonic Zone (GRTZ) and graben entered and combined with mid-size intrusions of Diabase and Gabbro magma to reduce magma viscosity and promote active magmatic differentiation in which low-density minerals crystallizing from the magma floated upward and high-density minerals sank. The upper part of this differentiated system is visible in a dike, so it is expected that the lower part where dense minerals settled also is present. If a magma intrusion 'floor' existed, high-density minerals settling from the magma may have piled up and accumulated on that magmatic floor, creating 'Cumulate' deposits of minerals containing iron, copper, gold, silver, cobalt, chromium, nickel, rare-earths and platinum-group minerals. There are two, and likely several more, sites in the Project area that exhibit magmatic differentiation.

3) Fault and Graben: Missouri is between two major northeast-trending spreading centers of late Precambrian age: the Midcontinent Rift System (MRS) to the northwest and the Reelfoot Rift to the southeast. The Grand River Tectonic Zone (GRTZ) is a large, ancient continental Transform Fault connecting the spreading centers and defining the east side of a GRABEN formed over the Missouri Batholith granite that creates the Missouri Gravity Low (MGL). The transform faults may have followed older lines of weakness, possibly fracture zones that controlled emplacement of younger gabbro and granite plutons in the older granite-gneiss terrain of the region. GRTZ may have been created as an effect of the mantle plume that created the Missouri Batholith.

GRTZ extends from the Reelfoot Rift extensional feature in southeastern Missouri northwest to the Midcontinent Rift System (MRS) where North America tried and failed to split apart during 1.0 Ga to 1.2 Ga in Kansas, Nebraska, Iowa and areas farther north and east, filling MRS with basic eruptive and intrusive rocks such as Basalt and Gabbro. GRTZ was active from late Precambrian through mid-Paleozoic.

GRTZ offered excellent passage to cold oxygenated groundwater from the surface moving laterally and downward into the rocks, and to hot hydrothermal fluids rising from deep igneous activity, geothermal gradient, and radioactive heating, a combination favorable for creation of Olympic Dam-type ore deposits where the two water systems intersected. Very long lived fault motion kept aquifer channels open and provided abundant pore space in which minerals could deposit.

Outwash of sand and gravel from adjacent hills into the graben, and local deposits of hot spring limestone, probably created excellent permeable and reactive host rock for deposition of minerals carried in solution by moving groundwater and hydrothermal fluids. Sand and gravel deposits in the graben were formed by streams transporting erosional debris from weathering of nearby granites and volcanic rocks enriched with uranium, thorium and potassium. Radioactive decay of uranium, thorium and potassium in parent igneous rocks kept hydrothermal fluids warm and active long after magmatic heat was gone and offer the possibility that warm water may still be present and moving in the fault and graben.

In addition to Precambrian mineralization, GRTZ and graben aquifers probably received a Mesozoic ‘reverse flow’ of mineralizing hydrothermal fluids generated by intrusion of basic to ultrabasic rocks along the Reelfoot Rift in extreme southeastern Missouri. Those solutions are thought to be the source of Mississippi Valley-type mineralization that created ore deposits of lead and zinc, with byproduct copper and nickel, in Cambrian host rocks at Fredericktown, Mine Lamotte and Park Hills on the east side of the Ozarks Uplift, and world-class ore deposits of the same metals in the Viburnum Trend along the Precambrian uplift core on the west side of the Ozarks Uplift. Deposits of minerals from the Mesozoic event may have overprinted and added to Precambrian minerals along GRTZ and in Precambrian aquifers in the graben.

Basic to ultrabasic rocks in the Reelfoot Rift are exploration targets for cobalt, nickel and related metals. Unfortunately, their location dead-center in the Reelfoot Rift seismic zone makes mining of discoveries impossible in any practical sense due to ongoing earthquake activity. It is almost guaranteed that any above-ground structures and below-ground mines will be shaken apart and the mine filled with sand and mud from local Mississippi River sediments liquefied during severe earthquakes.

Exploration in the GRTZ and along both sides of the graben is expected to find ore deposits containing uranium, thorium, gold, silver, iron, copper, lead, zinc, cobalt, nickel, manganese and possibly some buried Precambrian placers containing gold. Byproducts may include barite, fluorite, gypsum, and amethyst.

4) Skarn and Low-Grade Gold: Although not a primary exploration target it is possible that valuable deposits of gold may be found in a metasomatic Skarn environment while doing other exploration. One such deposit is known in the general Project area and

contains gold in concentrations ranging between a trace and one ounce per ton of generally micron-size gold. The overall grade and quantity of gold in that deposit are not known.

Precambrian volcano caldera lake deposits at Pilot Knob and probably many other locations were at the fumarole and hot spring surface end of hydrothermal systems originating from deep magmatic activity that created the volcanoes and known iron deposits. Although no gold is known at Pilot Knob and elsewhere in caldera lake sediments, geology is favorable for low-grade, high-tonnage gold and other valuable materials to have been deposited. This should be kept in mind while exploring and cores, outcrops and rock samples from such deposits should be examined for gold, silver and other valuable products using an analysis method such as x-ray fluorescence (XRF) sensitive to parts-per-million concentrations of many elements.

5) Carbonatite Rare-Earths: The area around Avon has about 80 known dikes and diatremes of Carbonatite and almost-Kimberlite scattered over 80 square miles. A few of the occurrences have been tested for diamonds and rare-earths. No diamonds and only background concentrations of rare-earths were found. Devonian-age fossils found in bits of sedimentary rock enclosed within two of the diatremes date diatreme activity as post -Devonian. The stratigraphic interval between the present land surface and the projected elevation of nearest Devonian age sedimentary rocks indicates that erosion has removed nearly a mile of overlying rock that the diatremes intruded.

This is not a high priority exploration area but should receive at least a little exploration activity. Do not expect to find diamonds – the geochemistry is not favorable. Rare-earths are possible at depth and in dikes and sills flanking known diatreme outcrops. Some of the diatremes that have not been examined may contain rare-earths in enough concentration and tonnage for profitable mining.

The parent magma probably was quite big to have produced diatremes over an area of 80 square miles. The problem is, the parent Carbonatite magma was likely very deep when the diatremes became active and the large primary mass of Carbonatite possibly enriched with rare-earths could be as far down as the base of the Earth's Crust, 80 to 100 miles, and way below possible mining depth. Still, it's worth a look. There may be a large sill or other massive accumulation enriched with rare-earths that may be profitable to mine if rising Carbonatite magma pooled closer to the surface. Sometimes that happens. Just don’t expend a lot of hope, time and resources on exploration.

6) The Ever Popular ‘OTHER’: In an area with this much historical geological activity there is a good possibility of making a dumb-luck discovery, the ever popular Wild Card accidental finding of some valuable ore deposit that was not on the exploration agenda but just showed up in drill core or sample analysis.

Structure, rock type, geochemistry, igneous activity, and tectonic activity suggest that ‘Other’ ore deposits could include as products or byproducts vanadium, lithium, tin, tungsten, uranium, lead, zinc, titanium, manganese, bismuth, gem stones, barite, fluorite, museum-quality crystals and general exotics.

REGIONAL GEOLOGY:

"Complex geology makes good ore deposits" is a truism that applies to the exploration Project. There was a lot of geological activity in Missouri during Late Precambrian.

Ga = Giga annum = one billion years ago.
1 kilometer = 0.621371192 mile. 1 mile = 1.609344 kilometer.

Miracle Project exploration for Olympic Dam-type ore deposits in the Project area will follow the Grand River Tectonic Zone (GRTZ), a large right-lateral Transform Fault that extends from the Reelfoot Rift in southeastern Missouri all the way through northwestern Missouri and on to the Midcontinent Rift System in Iowa. GRTZ is the eastern side of a Precambrian graben developed over the Missouri Batholith. The 1.37 Ga (or younger) Missouri Batholith is 125 kilometers (77 miles) wide and 600 kilometers (372 miles) long, trends northwest across Missouri, continues to intersection with the 1.0 Ga - 1.2 Ga Midcontinent Rift System, is made of granite, is 11 kilometers (about 8 miles) thick, and the top is about 5 kilometers (3 miles) below land surface. The northeast side of the batholith has a shallow dip of about 20 degrees and the southwest side a steeper dip of about 60 degrees. The Missouri Batholith can be traced by its gravity signature known as the Missouri Gravity Low (MGL), a zone of gravity measurements lower than gravity measurements in surrounding areas.

The Missouri Batholith formed when a Mantle Plume or Hotspot partly melted overlying crustal rocks, similar to what is happening today at Yellowstone Park. Heat from the Mantle Plume partly melted existing Precambrian crustal rocks, creating granitic magma that rose into overlying rocks and formed the batholith, and provided heat to power hydrothermal systems and low-grade regional rock alteration. In the extensive St. Francois Mountains Precambrian volcanic field that resulted, individual volcanoes may represent cupolas of the batholith. The batholith was emplaced during the interval 1.37 Ga to 0.6 Ga, but most likely at the end of or somewhat after the 1.37 Ga volcanic flows and regional low-grade hydrothermal alteration of magnetite to hematite. The Grand River Tectonic Zone may follow an earlier zone of crustal weakness created by the Mantle Plume and emplacement of the Missouri Batholith.

Although originally almost three miles thick, rhyolitic volcanic rocks were only a relatively thin veneer on top of older Precambrian rocks and are now generally reduced to a mile or less thickness by erosion. Exploration geologists must remember that today's mountaintop represents early volcanic eruptions and was deep underground within volcanic rocks or granite at the close of Precambrian volcanic activity. Following volcanic activity there was intrusion of basic magma that produced basalt, diabase and gabbro, now visible mainly as outcropping dikes but also likely to occur in large intrusive masses at depth below both the volcanic rocks and co-magmatic granites.

And finally, there may have been a late intrusion of Spavinaw Granite magma into and below both the basic rock and granite/rhyolite Precambrian volcanic system.

All that igneous intrusive activity likely caused low-grade regional metasomatism in which ore deposits were created by rock alteration, particularly at and near the boundaries between intruded and intruding rocks and in nearby faults and shear zones.

The mantle plume melted a lot of rock and powered hydrothermal systems that extracted chemical elements from the melted rock and moved those elements into new locations where ore deposits may have been, and surely were, created.

Many of those ore deposits probably survived Precambrian erosion and are still there for our exploration Project to discover.

WHAT TO LOOK FOR, WHAT TO USE:

The Miracle Project's primary goal is discovery of one or more Olympic Dam-type world class iron-copper-gold-uranium-thorium-rare earths ore deposits. The following items are important to that exploration:

1) Grand River Tectonic Zone: Initial exploration will be done along the southern end of the Grand River Tectonic Zone (GRTZ) along a band extending about 30 miles east and 10 miles west of GRTZ. This area is vertically and horizontally close to the underlying Missouri Batholith and close to the source of rising hydrothermal fluids and descending oxygenated surface groundwater moving within GRTZ that may have emplaced Olympic Dam-type ore deposits where the two fluids met and mixed. Precambrian rocks are less eroded here than farther north so any Olympic Dam-type ore deposits that may ever have existed in the Project area are likely to still exist. Of particular interest is intersection of GRTZ with ***PRECAMBRIAN*** faults including volcanic collapsed caldera ring faults where there may have been concentrated hydrothermal, groundwater and brecciation activity. Olympic Dam-type ore deposits are most likely to be found along long-lived crustal-scale faults in brittle fractures, narrow rifts, fault splays, shear zones, dilational jogs, zones of high permeability, fault bends, rock contacts and breccia bodies. Within clusters of known deposits in other areas such as South Australia, iron oxide deposits may form a trail up to 70 miles long and more than 10 miles wide, with individual deposits at intervals of 10 to 20 miles. These linear areas offer better prospecting than areas where iron deposits are scattered.

2) Gravity and Magnetic: An Olympic Dam-type ore body typically contains enough iron minerals to cause a gravity ‘high’ over the deposit. Coincident magnetic and gravity ‘highs’ are diagnostic of an Olympic Dam-type mineral deposit and can be mapped quickly (days to weeks) and at low cost. These are screening tools to locate interesting prospects for further investigation and drilling. With some magnetometers, instrument cycle time is fast enough that magnetic measurements on the ground can be

made from a moving vehicle, although results are complicated by the mass of magnetic material (iron) in the vehicle. Field survey gravity and magnetic results will be somewhat complicated by presence of denser basalt, diabase and gabbro intrusives within and below the volcanic rocks.

Good quality older magnetic maps already are available for reconnaissance. However, a new magnetic survey should be done in prospective areas to obtain magnetic and location information that may be of better quality and finer detail than provided by older surveys. Local Precambrian rock is hard, drilling is slow and expensive, and the best available information is necessary to pick sites where drilling finds ore deposits with minimum drilling cost and fewest missed targets.

If funds are available, an airborne magnetic survey should be done and can be combined with gravity and gamma ray spectrometry and perhaps other geophysical investigations and aerial photography on the same flight. Airborne surveys are fast and can go anywhere without restriction by landowners who may be fussy about minerals exploration. Magnetic surveys done on the ground are acceptable and less costly but are much slower and may be limited by denial of access to areas of interest. When a drill site is being selected, a magnetic survey and gravity survey of limited extent (about one square mile) should be done on the ground surrounding the proposed drill site to obtain finer detail to assist site location.

A strong magnetic ‘high’ and adjacent magnetic ‘low’ locate the sides of a magnetic body and indicate Magnetite iron oxide mineralization below the midpoint of the magnetic contours' peak and valley. In the Project area some part of the iron oxide is usually non-magnetic Hematite that does not contribute to the magnetic ‘high’ but does add to the gravity signal. If the gravity signal is strong, a muted magnetic contour pattern may indicate a mixture of Hematite and Magnetite and does not necessarily mean prospect rejection.

A peak of gravity contours midway between the peak and valley of magnetic contours should directly overlie the exploration target and is where the first hole should be drilled.

3) Gamma Ray Spectrometry: Gamma Ray Spectrometry measures gamma radiation that indicates the concentration of Potassium, Uranium, and Thorium in rocks and soil. Potassium and uranium are usually concentrated in and around Olympic Dam-type ore deposits. Thorium is not much affected by rock alteration and by potassium and uranium mineralization. The RATIO of uranium to thorium, and potassium to thorium, are sensitive mineralization indicators that are independent of actual concentrations of those elements. Increase of uranium, potassium, and in some cases thorium, and their ratios, extends beyond the actual Olympic Dam-type ore deposit and offers a bigger target for exploration.

Gamma Ray Spectrometry can be done from an aircraft at the same time other kinds of geophysical tests are done. Small portable spectrometers are available for use by field personnel on the ground. Radiation measurements are quick and easy, requiring only a few minutes at each measurement station. Better quality spectrometers are available that record GPS location (Global Positioning System, latitude & longitude) and store field notes information for direct transfer to a computer which makes record keeping and data processing much faster and easier.

4) X-Ray Fluorescence: X-Ray Fluorescence (XRF) uses a small, portable instrument that irradiates rocks, soil and other materials with energy from x-rays produced by the instrument or by an internal radioactive source. The target material re-radiates x-rays that are detected and processed by the XRF instrument to determine the presence and amount of most of the elements in the Periodic Table. The process is fast, easy, simple, and is sensitive to concentrations of various elements ranging from upper tens of percents to parts-per-million. Better quality XRF instruments incorporate GPS for sample location and store field notes information and transfer information directly to a computer which makes record keeping and data processing much faster and easier.

XRF can map alteration haloes surrounding Olympic Dam-type ore deposits, offering a larger target for exploration screening. XRF also can detect elements that may not be visible or otherwise not noticed (such as micron-size gold) and can direct attention to what may be an important hidden ore body containing gold, platinum, or many other elements. XRF also is useful for analysis of core and rock chips/mud from drilling.

5) Infrared Spectrometry: Infrared Spectrometry detects, identifies and measures alteration products such as various clays present in rock in and around Olympic Dam-type ore deposits. These clay alteration products form where hydrothermal fluids alter rock, usually in the fumarole and hot spring upper end of an active hydrothermal system that is depositing ores and indicator minerals at depth. Small field instruments are available for this work. Large areas can be analyzed by an Infrared Spectrometer carried in an aircraft, usually in conjunction with other kinds of airborne surveys.

6) Other methods: Miracle Project exploration for Olympic Dam-type ore deposits in the Project

area is primarily based on geology and geophysics, but other exploration methods may apply. In particular, soil gas surveys, stream sediment geochemical analysis, electrical surveys, petrographic surveys and other methods of investigation may prove useful and should be tried. The approach will be, when a mineral deposit or ore deposit is found, try different techniques to determine whether some other exploration method can find the known mineralization and whether that method offers any advantage. Some methods may be used later when exploration is less active and work transitions into ore body definition and deposit-specific investigations.

PROPOSED ACTIVITY:

Missouri's deep Precambrian rocks are an exploration frontier. Very little is known in detail. Any plan of operation must remain flexible and respond to results of day-to-day operation. It is entirely possible that no Olympic Dam-type ore deposit will be found but some valuable ‘Other’ ore deposit will turn up and divert attention and resources.

Regardless, there needs to be a plan of operation to begin work. It is assumed here that Miracle Project exploration activity will concentrate on discovery of one or more world-class Olympic Dam-type ore deposits and that exploration will be successful. If resources permit, a Magmatic Differentiation prospect may be explored concurrently.

In case of exploration failure, the Miracle Project will shut down, assets will be sold, sites cleaned up, and remaining money returned to investors – a relatively fast and easy process.

In case of success, exploration will extend to other targets as resources allow. Work on a discovery will continue to evaluate and define the ore body, a process that gradually replaces exploration, goes on for several years, and leads eventually to mining and finally to shut-down and land reclamation several decades in the future.

At some time during the process of successful exploration and ore body definition, it will be time to decide the Miracle Project's future. Will the property be sold? Will the property be mined? Should money be borrowed or obtained from investors to form a mining company? These and similar questions need to be answered when enough information is available to make a decision, probably at about five years after exploration startup.

I (William Jud) will be Exploration Manager. Alan Mays will be Business Manager.

Extensive use will be made of contractors and consultants, people who tend to have the best equipment and experience, work quickly, and are up-to-date on geology and exploration methods. A secondary reason that I will manage instead of performing most field work is that I am recovering from a knee injury and am presently not able to walk the long distance over rough terrain that field geology requires. I am working on recovery and making progress, but at this moment am not able to handle the physical requirements of a field geologist. And I am 76 years old - it is time for younger and stronger people to take on the heavy lifting.

Also, this is my Project. I developed the genetic and exploration models. I am familiar with exploration techniques, activities, geology, and goals of the Project. I can be an effective Exploration Manager.

Alan is in charge of land acquisition, legal matters, payroll, records, supervision of office management, funding, contacts with industry people, leasing/buying real estate and vehicles, hiring contractors and consultants, government agency requirements, obtaining a business bank account and company credit card, and other administrative activities. Alan will direct an on-site Project employee in daily charge of these matters.

1) <u>Startup:</u> Lease office and core warehouse space. Obtain vehicles, including a heavy-duty 4-wheel-drive pickup truck, a 4-wheel-drive passenger car, and two light-duty motorcycles for field mapping and reconnaissance. Obtain office equipment, telephone and Internet hookup, utilities service, business license. Generally prepare for administrative support of exploration work to follow.

Obtain drafting supplies, communications equipment, geological and geophysical instruments including magnetometer, gamma ray spectrometer, infrared spectrometer, X-Ray Fluorescence spectrometer, maps and publications, sample bags, and various small items such as rock hammers, a camera, and ultraviolet lights. Tables and extensive sturdy metal shelving will be needed for processing core in the warehouse.

Hire one or two helpers as needed, or get people from a Temporary Employment Agency. If available, hire geology students as part-time general helpers. Students are always short of money and eager to work, especially in their intended profession, and should be available from nearby (100 miles) Missouri University of Science and Technology in Rolla, Missouri.

2) <u>Deep Drilling:</u> Although optional, I <u>**STRONGLY RECOMMEND**</u> that an early core hole be drilled to a depth of <u>**two miles**</u>. A deep core dill hole in a new exploration area is the equivalent of the Table of Contents in a new book; that is, it is a preview of what is to come. It is especially important that this geological overview be done at the start to learn the deep geology and mineral potential. A deep hole is quite expensive. But missing an ore deposit or critical geological information to save a few dollars on drilling is a disaster! There are cases in which an ore body was considered mined-out and the mine was closing, only to discover an even better ore body several hundred feet deeper.

Most follow-up drill holes are likely to be much less deep than the first reference hole, probably in the range of 1,000 to 2,500 feet. Depending on what is found, two miles is still within possible mining depth. AngloGold Ashanti’s Mponeng gold mine, located south-west of Johannesburg in South Africa, is more than 2.5 miles deep.

Two Olympic Dam-type exploration targets are already defined on a reconnaissance level. The first priority site needs detailed magnetic and gravity mapping on the ground to define the exploration target, then a core drill will be set up to go two miles (probably vertically) into Precambrian rocks. A drilling contractor estimated progress at about 50 feet per day (or per shift) so this deep hole could take about 211 days of drilling plus delays for weekends, holidays, breakdowns and bad weather, or about 275 to 300 single shift (190 double shift) days in all. If an ore deposit is discovered up-hole, before the deep hole is finished, a second drill could be moved in to explore that deposit while the first drill is finishing.

Missouri's deepest Precambrian hole will attract the attention of academics and research geologists who will want to examine core and conduct geophysical tests. Offering access to core and the hole in exchange for an advance copy of research results is a way to have lots of useful scientific study accomplished at no cost to the Project. Of course, **Non Compete, Non Disclose** agreements would be part of the deal during the time when exploration information must be kept secret.

Later, most of that information restriction would be reduced and academics and geologists would be welcome to publish their findings. Some of the more highly qualified professors and students may become full-time employees.

SUMMARY:

The Miracle Project resembles putting a jigsaw puzzle together. At this time, there is one high-priority Olympic Dam-type exploration target cluster of six individual targets and a second Olympic Dam-type target on trend and ten miles from the first target, and a high-priority Cumulate target. The more parts that can be found and assembled, the more complete the picture. The Miracle Project exploration area in Missouri has all the pieces necessary for successful exploration for Olympic Dam-type and other kinds of ore deposits. These pieces of information include:

~STRUCTURE: The Grand River Tectonic Zone (GRTZ) is a crustal-scale, long-lived transform fault that was a conduit for rising hydrothermal fluids and descending oxygenated groundwater, allowing reaction between the two fluids and creating open space for minerals to deposit. Intersection of GRTZ with other Precambrian faults and caldera collapse ring faults created favorable conditions for development of Olympic Dam-type and other ore deposits.

~ KNOWN DEPOSITS: The Pea Ridge iron deposit and nearby iron deposits are considered to be 'roots' of Olympic dam-type deposits from which upper levels have been removed by erosion. To the south along GRTZ erosion cut less deeply and any Olympic Dam-type ore bodies that ever were there, including the upper levels likely to contain iron, copper, gold, silver, uranium, thorium, and rare earths, should still be there.

~BATHOLITH AND METASOMATISM: Missouri Batholith granite underlies the present surface at shallow depth. Heat from a Precambrian mantle plume or hotspot melted lower crust and generated hydrothermal activity accompanied by widespread, low-grade metamorphism that caused relocation and deposition of many chemical elements and minerals, including iron oxides. Mafic intrusions also are present.

~GRAVITY AND MAGNETICS: Coincident gravity and magnetic positive anomalies are considered diagnostic of Olympic Dam-type deposits. The Miracle Project exploration area is well populated with positive magnetic anomalies and there are some data on gravity. Gravity and magnetic surveys offer an effective, fast and inexpensive prospect identification and screening tool.

~DEPTH: Discovered Olympic Dam-type ore deposits are likely to be relatively shallow, in the range of 1,500 to 3,000 feet below surface and within practical mining depth.

~TONNAGE AND GRADE: Olympic Dam-type ore deposits (including Iron Oxide-Copper-Gold ore deposits) vary widely in size and metals content, and can be huge. Size ranges between 10,000,000 and 4,000,000,000 (metric) tonnes, with 0.2% to 5% copper, 0.1 to 3+ grams per tonne (parts per million) gold, and significant amounts of iron, rare-earths, silver, thorium and uranium.