

# Gas Hills Uranium Recovery Facility Update – June 18<sup>th</sup> 2012





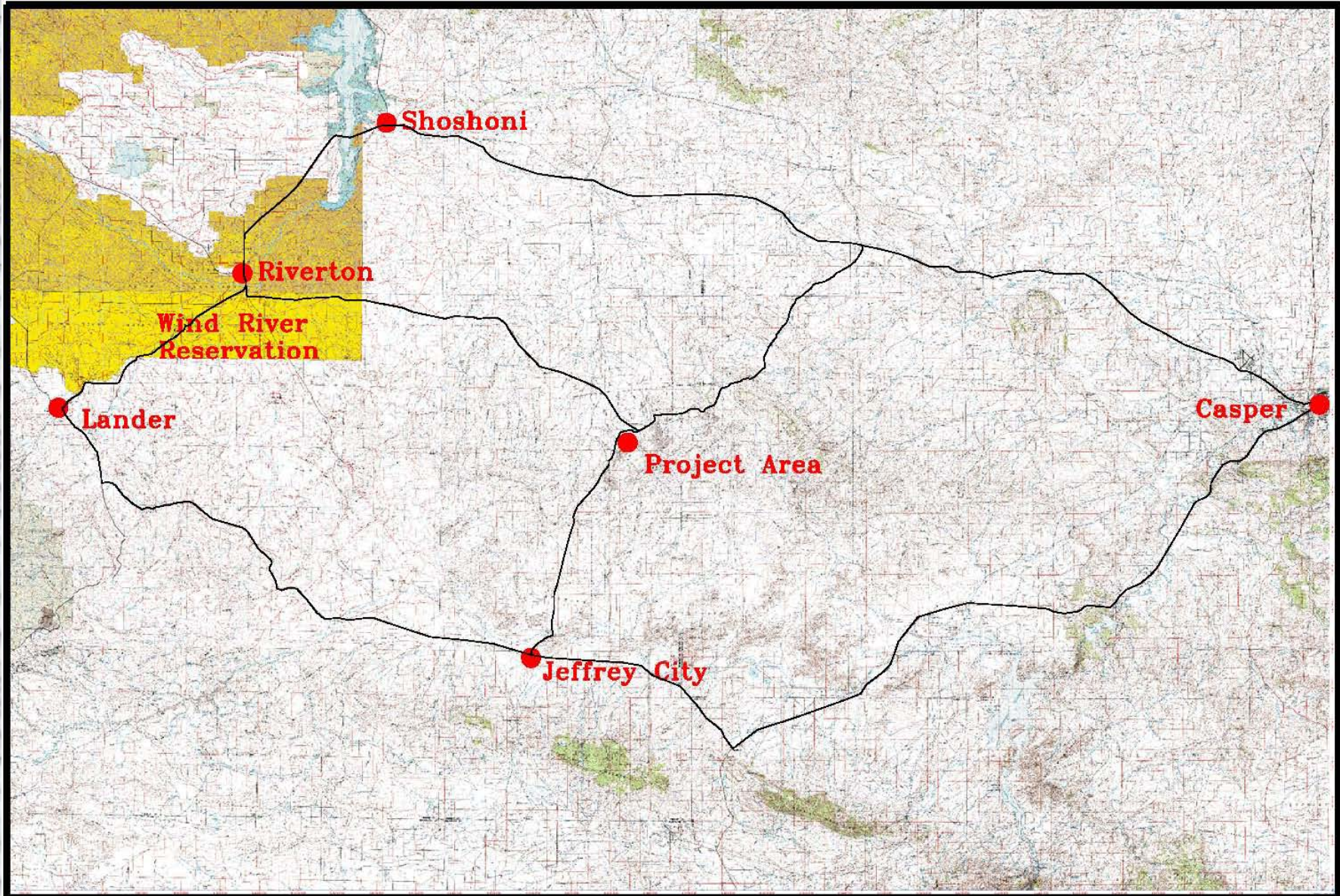
# **Strathmore Heap Leach Permitting**

## **Update – June 18<sup>th</sup> 2012**

- **Gas Hills Uranium Recovery Facility (GHURF) is centrally located in historic uranium mining district**
- **Baseline studies are underway**
- **Permitting of surrounding mines is underway**
- **Strathmore is coordinating with BLM and WDEQ-LQD on mining area EIS**



# Strathmore Resources Proposed Gas Hills Uranium Recovery Facility (GHURF)



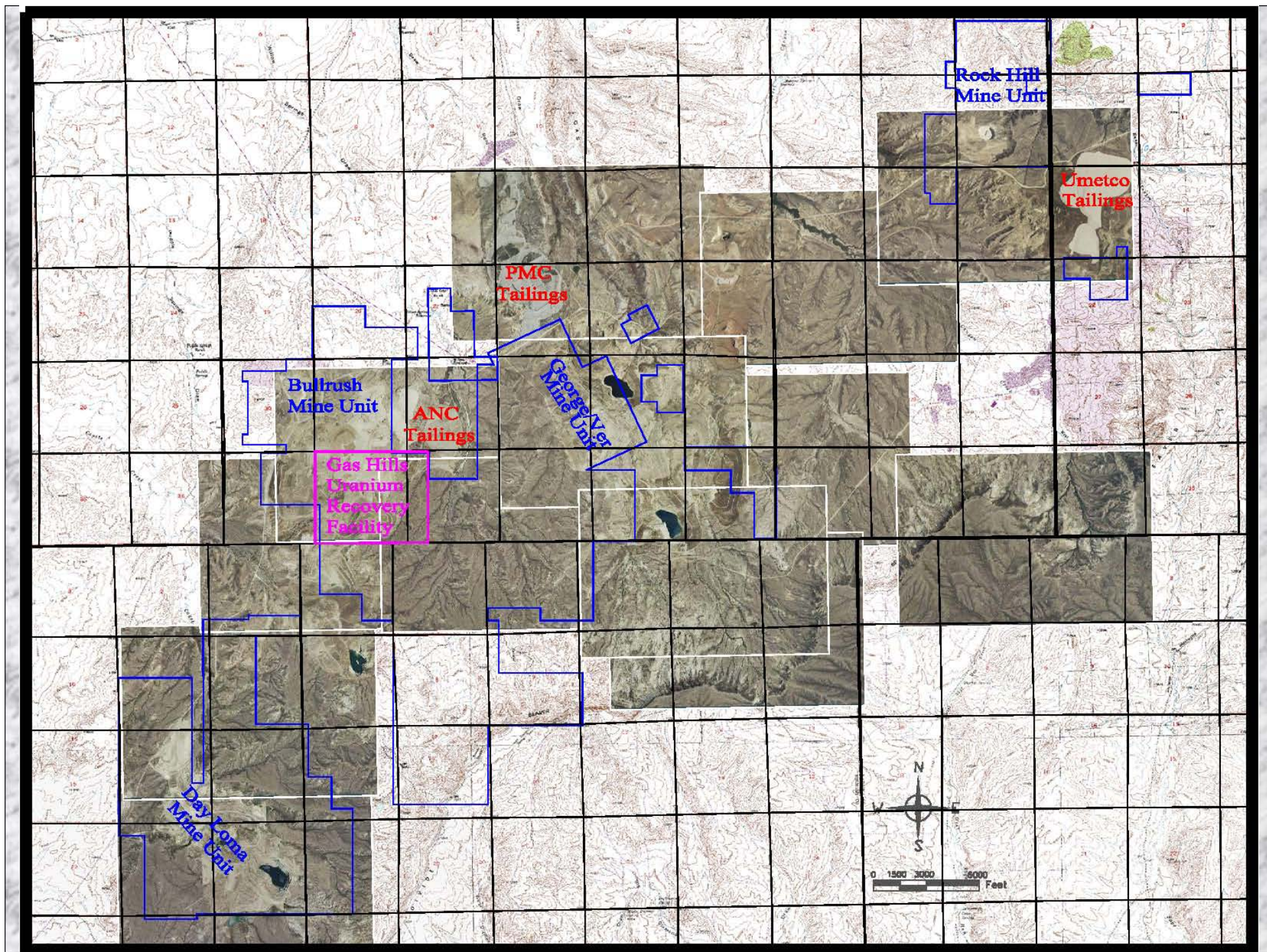


# **Surrounding Mine Permitting**

- ▣ **Gas Hills Project Mine Permit in development for WDEQ-LQD**
- **Includes Four Mining Units**
  - ▣ **George/Ver Mine Unit**
  - ▣ **Bullrush Mine Unit**
  - ▣ **Day Loma Mine Unit**
  - ▣ **Rock Hill Mine Unit**

**Mining units will supply ore to GHURF from distances of 1/4 to 7.5 miles**







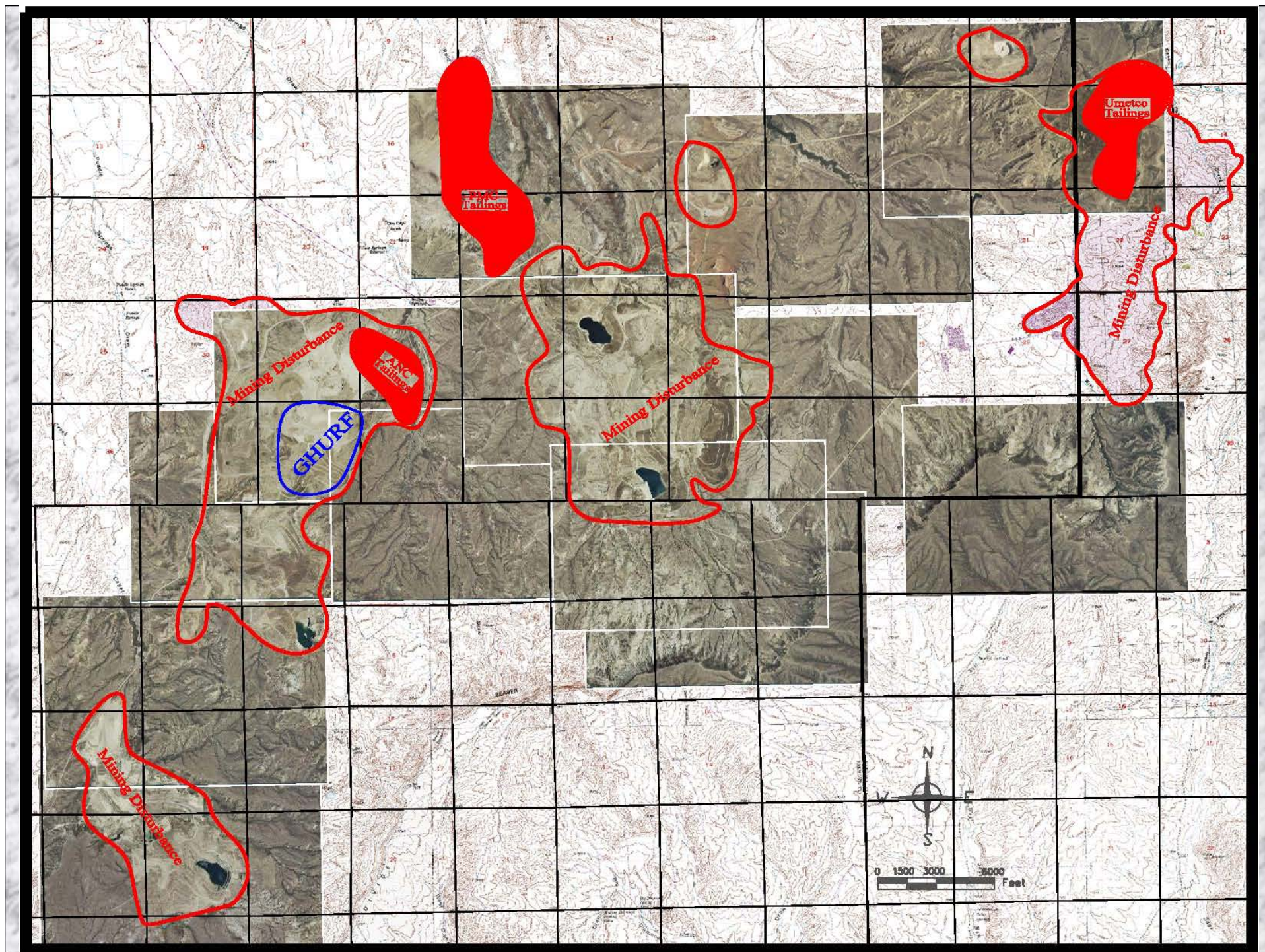
# **Mining Area EIS**

- ❑ **BLM and WDEQ-LQD agreement on permitting of multiple mine units**
- ❑ **Strathmore in discussions with BLM on EIS development**

**Location of GHURF within mining permit area should result in many common EIS components**

**Surrounding mining disturbance creates common “brownfield” condition for mining and heap leach areas**





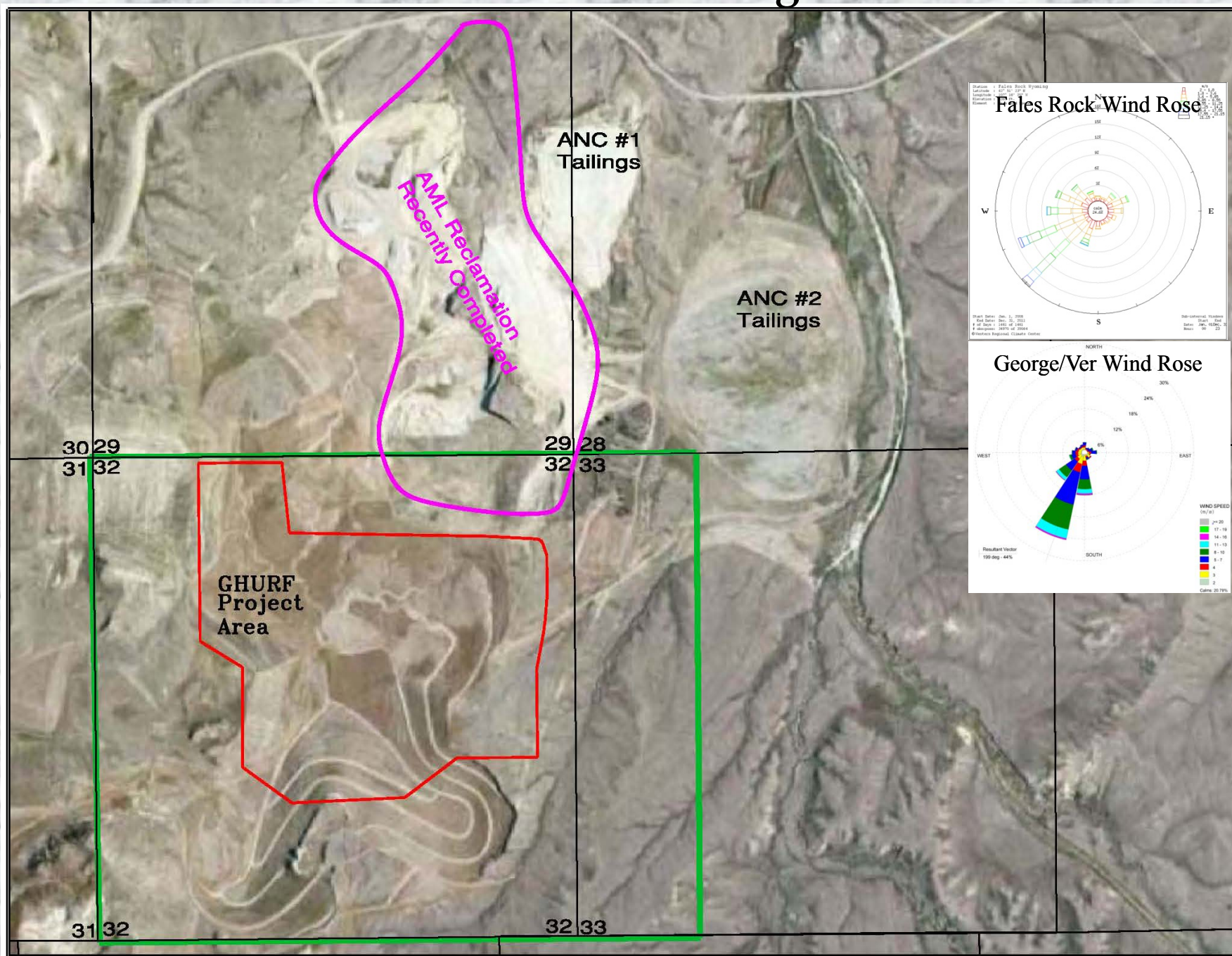


# Site Baseline Studies

- ❑ Abandoned Mine Lands (AML) reclamation is recently completed
- ❑ Meteorological Station Installed
- ❑ Ground and Surface Water Sampling Continuing
- ❑ Air Sampling Stations Installed
- ❑ Soil Samples Collected and Analyzed
- ❑ Vegetation Samples Collected and Analyzed
- ❑ Radon Flux Sampling Conducted
- ❑ Some AML gamma survey data available

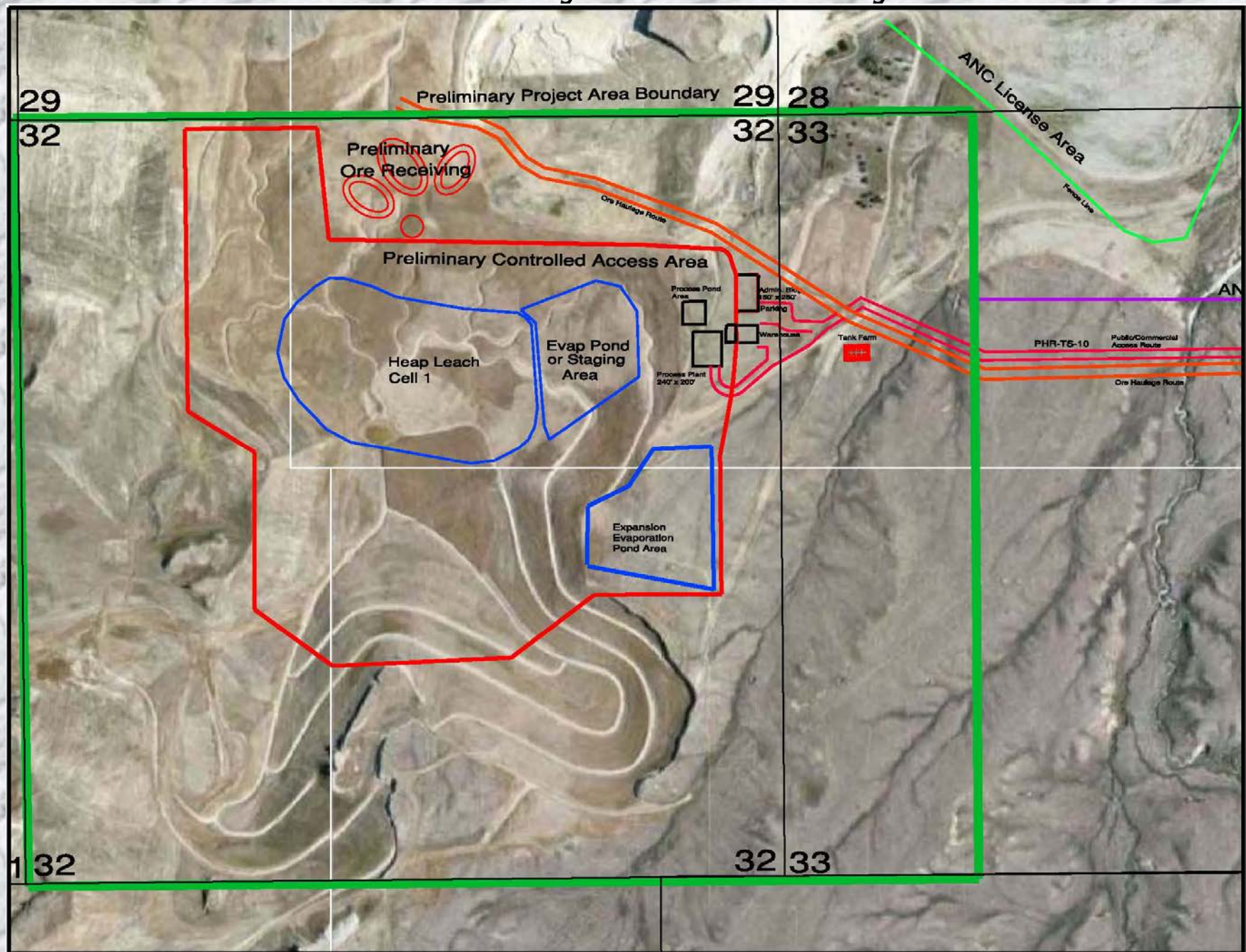


# GHURF Location and Surrounding Disturbance





# Preliminary GHURF Layout





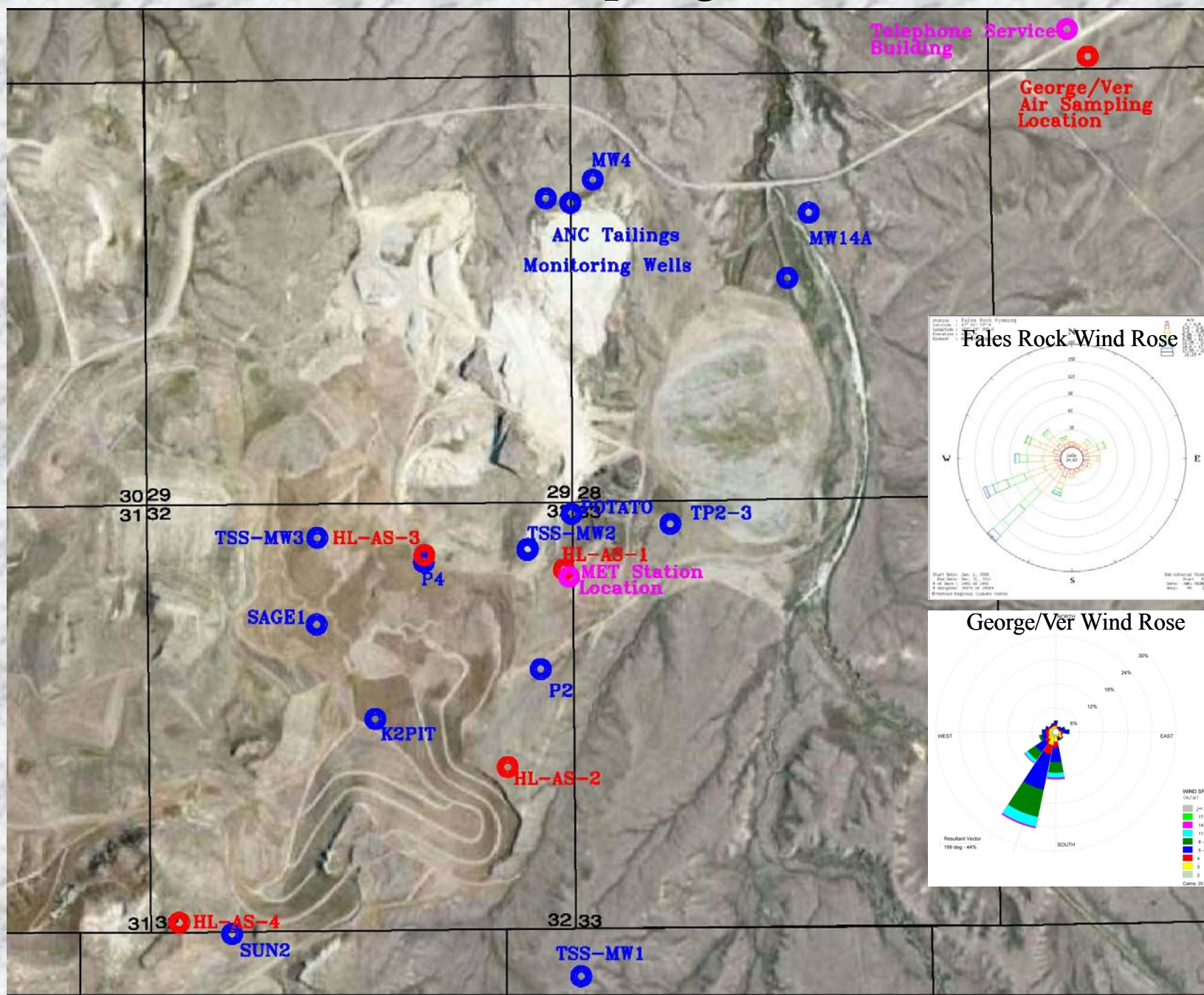
# Site Baseline Studies

## ▣ Meteorological Station

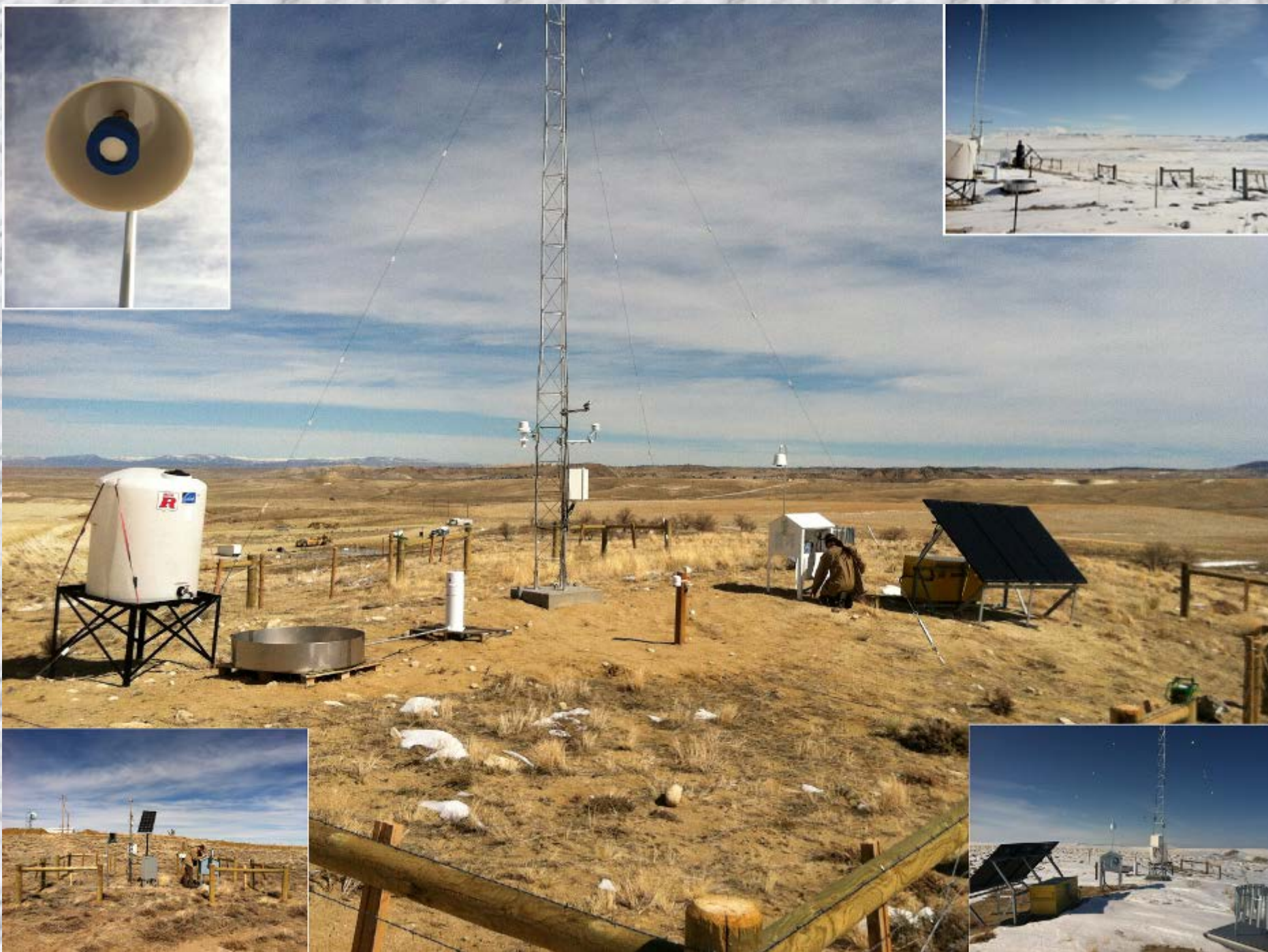
- 10 Meter Tower
- Precipitation
- Wind Speed and Direction
- Differential Temperature
- Solar Radiation
- Evaporation Pan



# MET Station, Air Sampling, and Well Locations









# Site Baseline Studies

## □ Soil and Subsoil Sampling

- Soil sampling to 5 cm depth (RG 4.14)
- Point samples and 1 meter<sup>2</sup> composite
- Lab and field duplicate samples processed
- Subsoil sampling to 1 meter depth in three intervals (0-33 cm, 33-67 cm, 67-100 cm)
- Ra-226 in soils ranging from 1.3 to 99.7 pCi/g

## □ Radon Flux Measurements

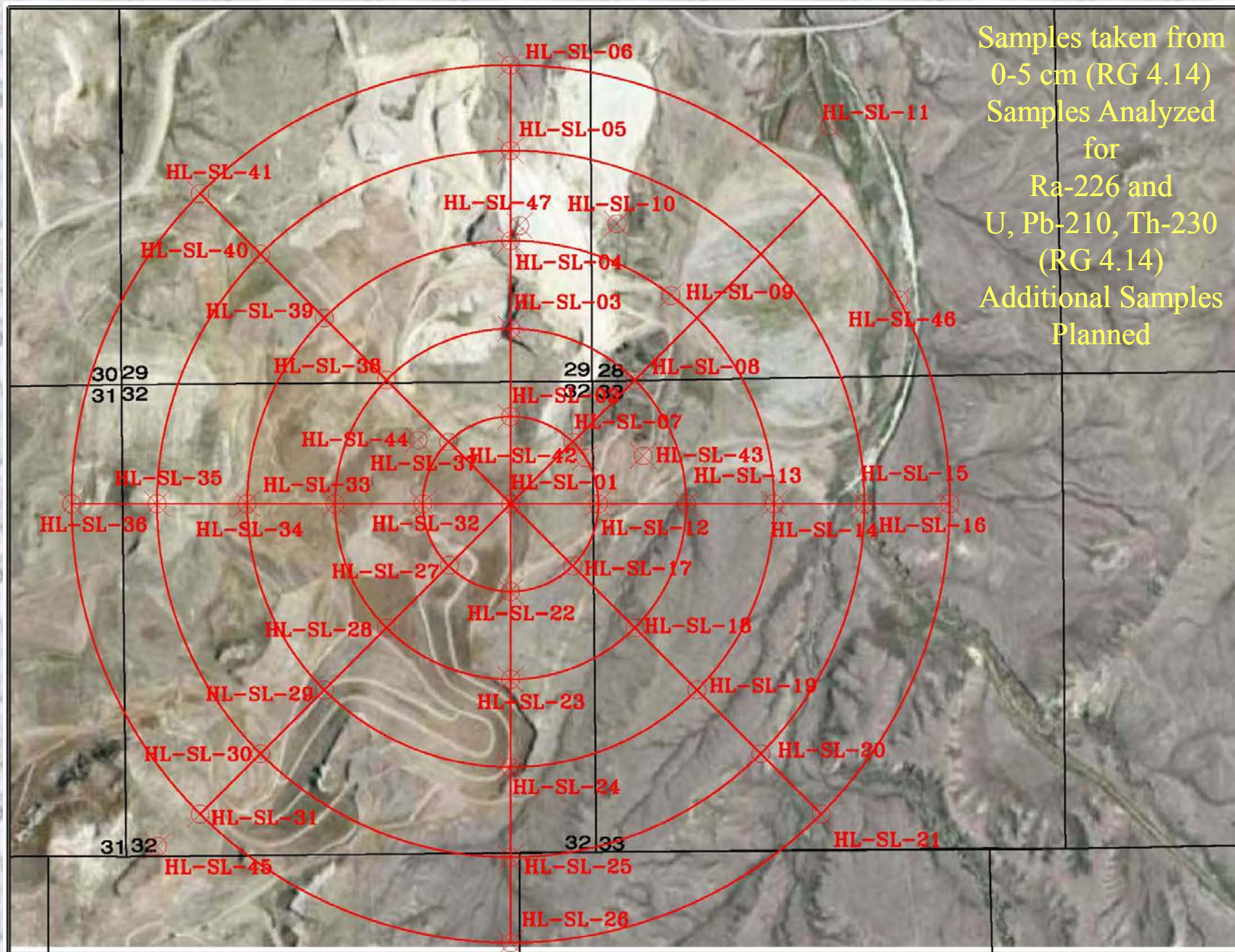
- Three cycles of radon flux measurements
- Radon flux ranged from 1.51 to 36.89 pCi/m<sup>2</sup>/sec

## □ Vegetation Samples

- Series of three vegetation samples at three locations

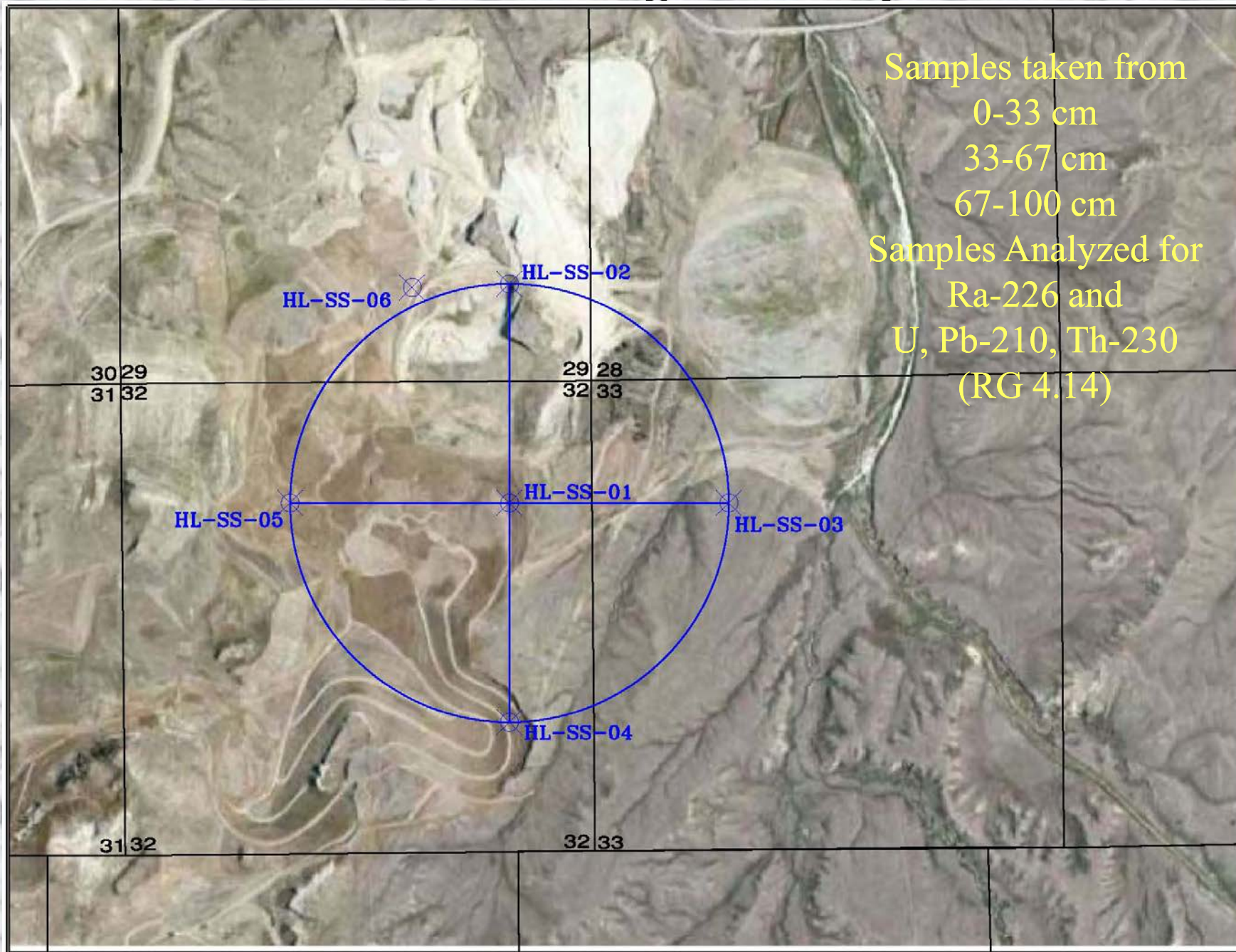


# Surface Soil Radiological Sample Locations



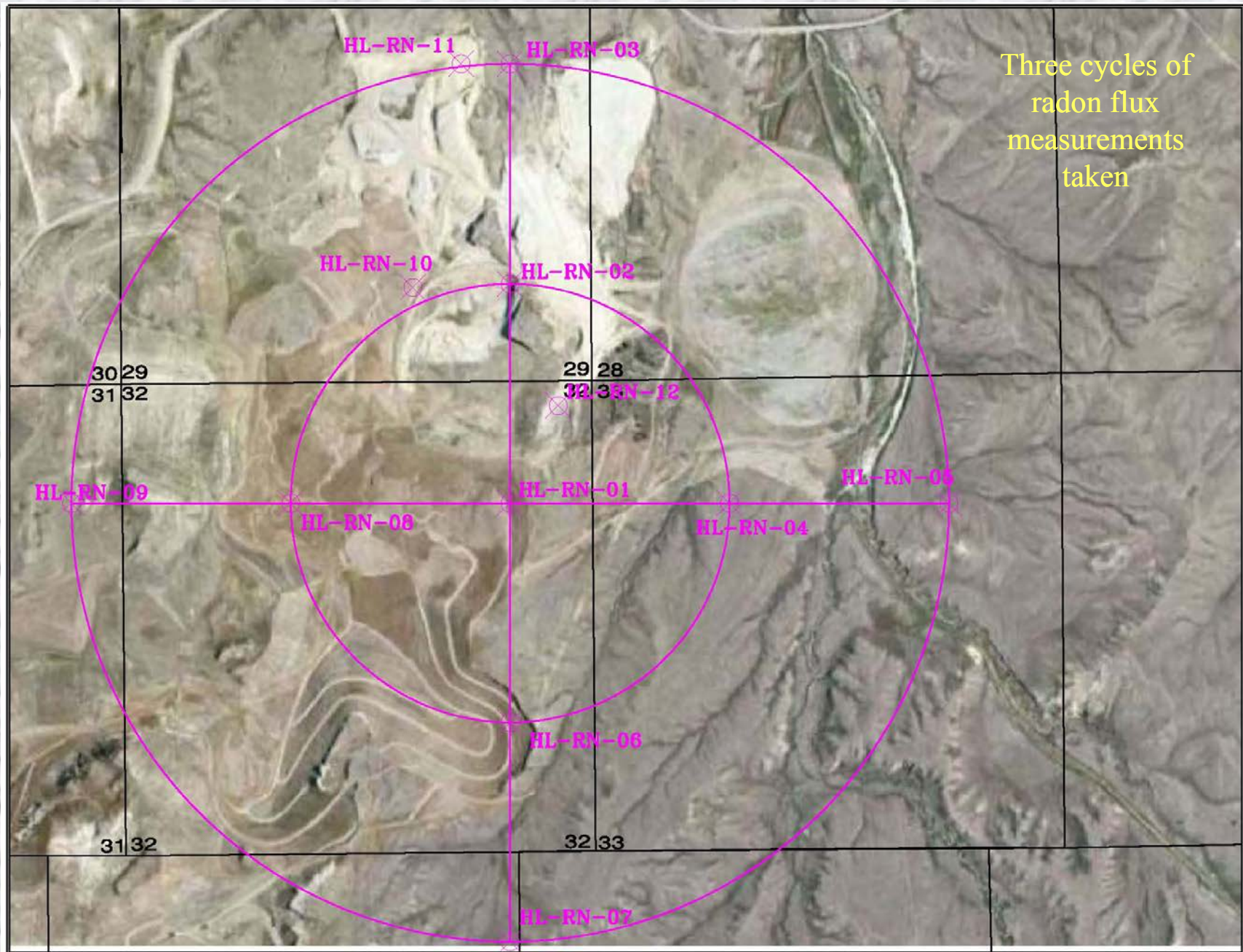


# Subsurface Soil Radiological Sample Locations





# Radon Flux Measurement Locations





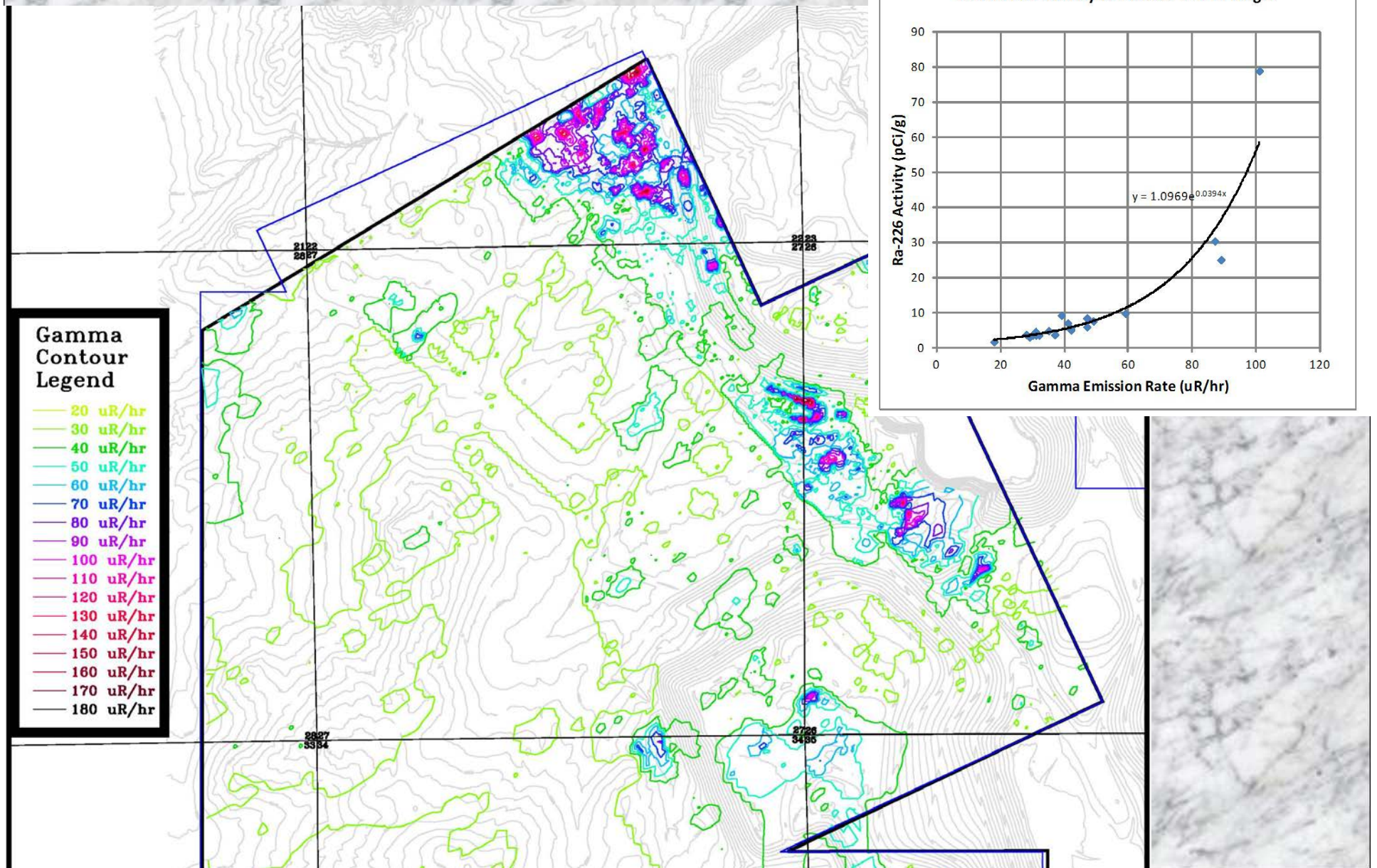
# Site Baseline Studies

## ▣ Gamma Survey

- AML gamma survey data available
- Some preliminary gamma data taken
- Automated gamma survey technique planned



# George/Ver Mine Unit Gamma Survey



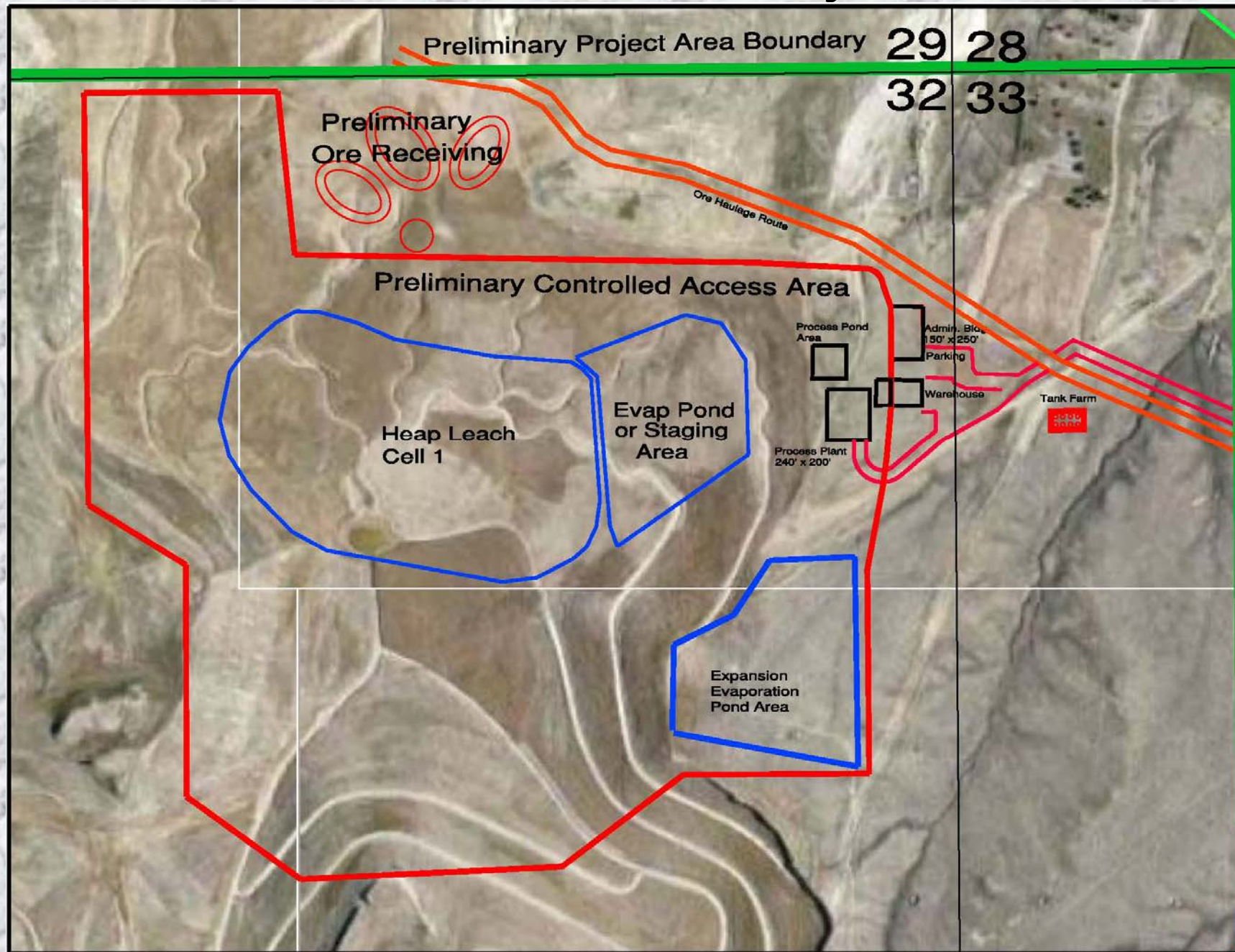


# **Additional Baseline Work**

- ❑ **Expansion of gamma survey – extension to include historic mining and milling disturbance**
- ❑ **Expanded data for gamma vs. radium-226 activity in soils**
- ❑ **Additional soil sampling for expanded area – alternate sampling intervals**
- ❑ **Additional radon flux measurements**
- ❑ **Biological samples (livestock or wildlife)**



# General Site Layout





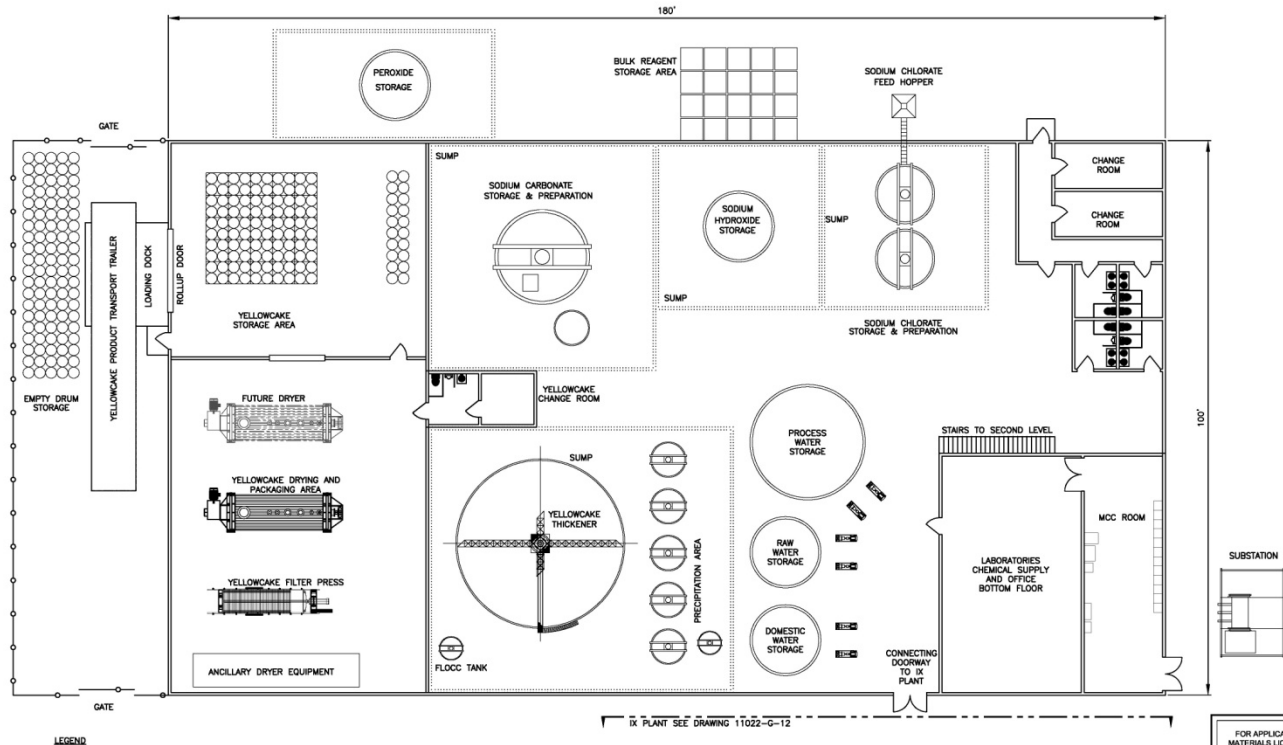
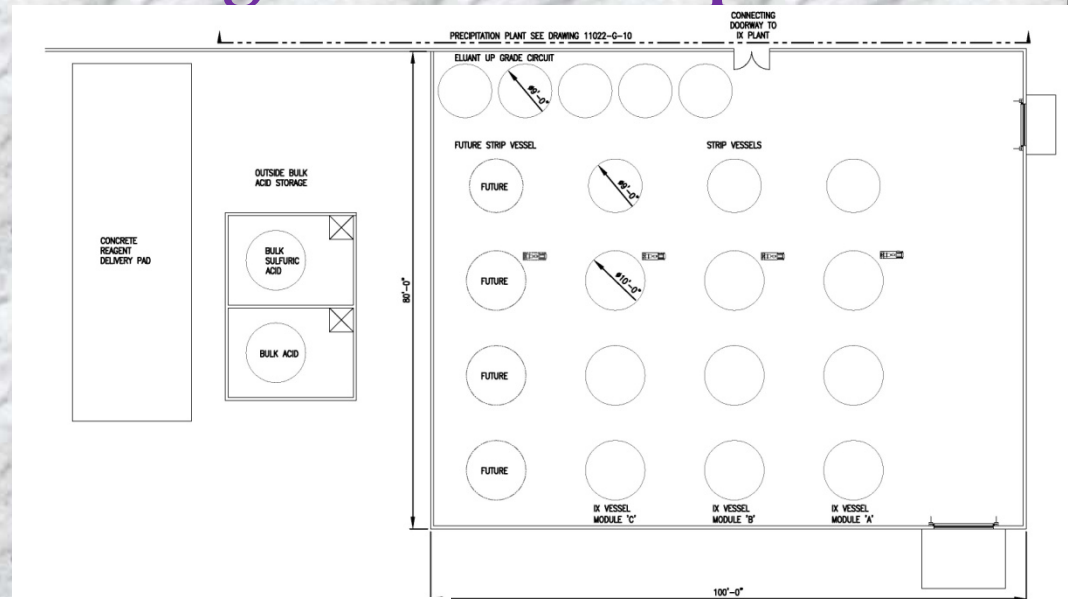
# Process Plant Concept

- ❑ Ion Exchange (IX) method uranium recovery
- ❑ Target process plant capacity – 1200 gpm fluid processing for 1000 tpd heap loading
- ❑ Reverse Osmosis (RO) treatment of bleed fluids is anticipated prior to evaporation pond
- ❑ Standard elution, precipitation, dewatering, vacuum dryer and packaging facilities design



# Plant General Arrangement Concept

Standard Elution, Precipitation,  
Drying and Packaging



Standard IX  
Uranium  
Capture



# **Heap Leach Cell**

- **Heap leach cell and evaporation pond within closed basin**
- **Cell #1 shown as conceptual 40 acre cell**
- **Cell(s) will be double synthetic lined or synthetic/GCL with leak detection system**

**Drainage systems will be installed to deliver fluids to sump(s)**

**Multiple sumps and/or redundant sump access pipes will be installed**

**Target slope for cell base is 2.5% or greater to promote positive fluid recovery**

**Drainage network will have a capacity several times greater than the target fluid processing rate**



# **Ore Handling and Stockpiling**

- ❖ **Planned pad loading rate of 1,000 ton/day**
- **Ore delivered from four mine units will be stockpiled outside of the NRC licensed area in the ore receiving area**
- **Ore will be transported by a loader from stockpiles to a hopper feeding the conveyor system to the heap**
- **The conveyor feeding system will use feeder/breaker equipment**
- **The conveyor system will convey ore into the NRC licensed area and deliver it to heap loading equipment/conveyors**

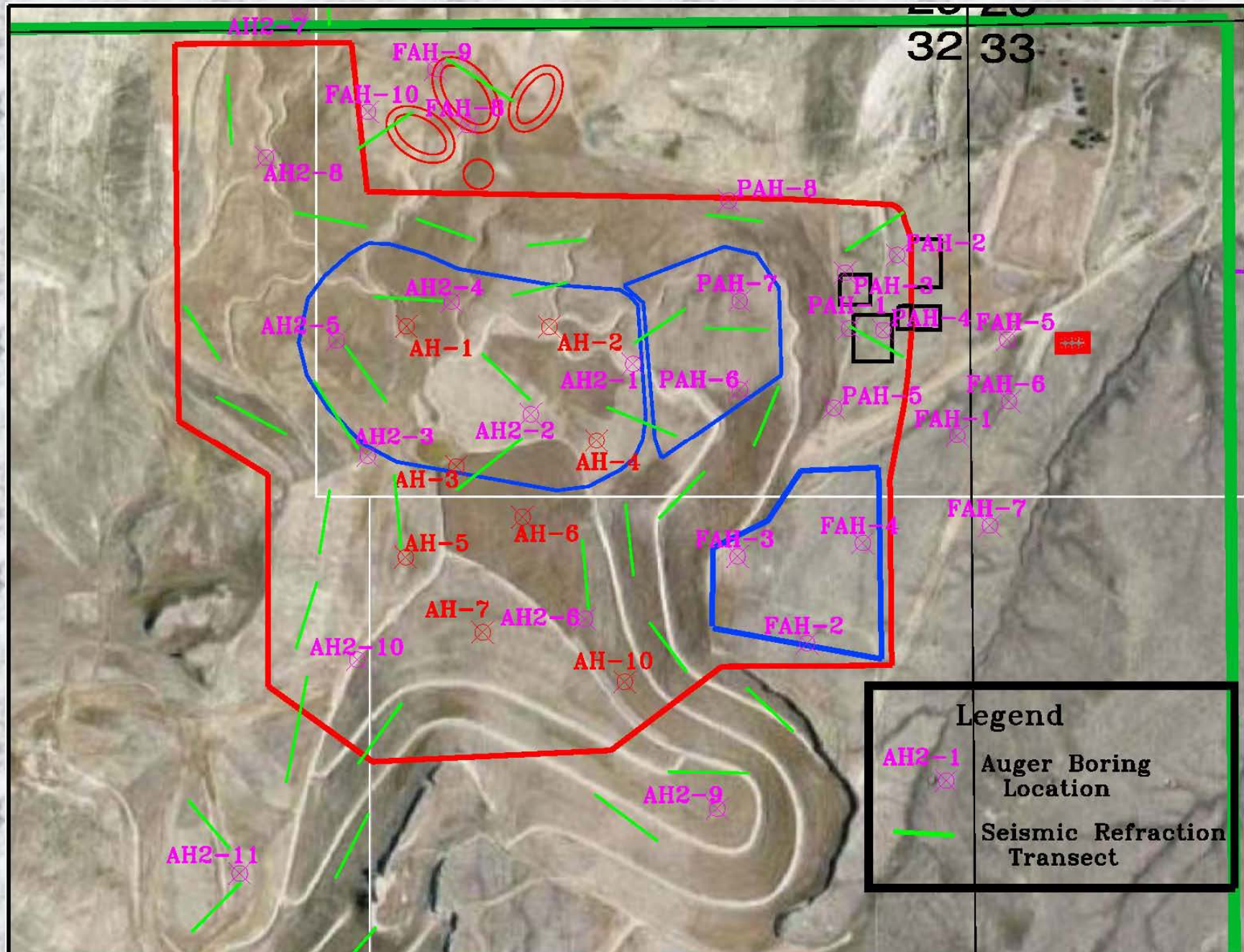


# **Geotechnical Evaluation**

- ❖ **An auger hole drilling and logging program was conducted to evaluate the suitability of the basin area as a foundation for heap leach cells**
- **The geotechnical drilling program is being expanded to characterize:**
  - ▣ **Backfill in the heap leach cell area**
  - ▣ **Backfill in the general heap basin**
  - ▣ **Foundation for plant area**
  - ▣ **Foundation for other buildings/structures**
  - ▣ **Foundation for ore receiving area, ponds, etc.**
- **Geotechnical drilling will be supplemented by seismic refraction survey**



# Geotechnical Program Expansion





# Ore Processing Studies

**Two column tests completed**

**Extended (20 ft) column test underway**

**Many bottle roll tests completed**





## **Conclusions**

- ❖ **GHURF centrally located within historic and planned uranium mining areas**
- **Past mining disturbance results in common “brownfield” conditions for GHURF and surrounding mine units**
- **BLM EIS process will provide useful information for NRC EIS process**
- **Continuing baseline studies will characterize profoundly disturbed project area**
- **Overall processing concept provides a very good reclamation plan for a previously mined area**