



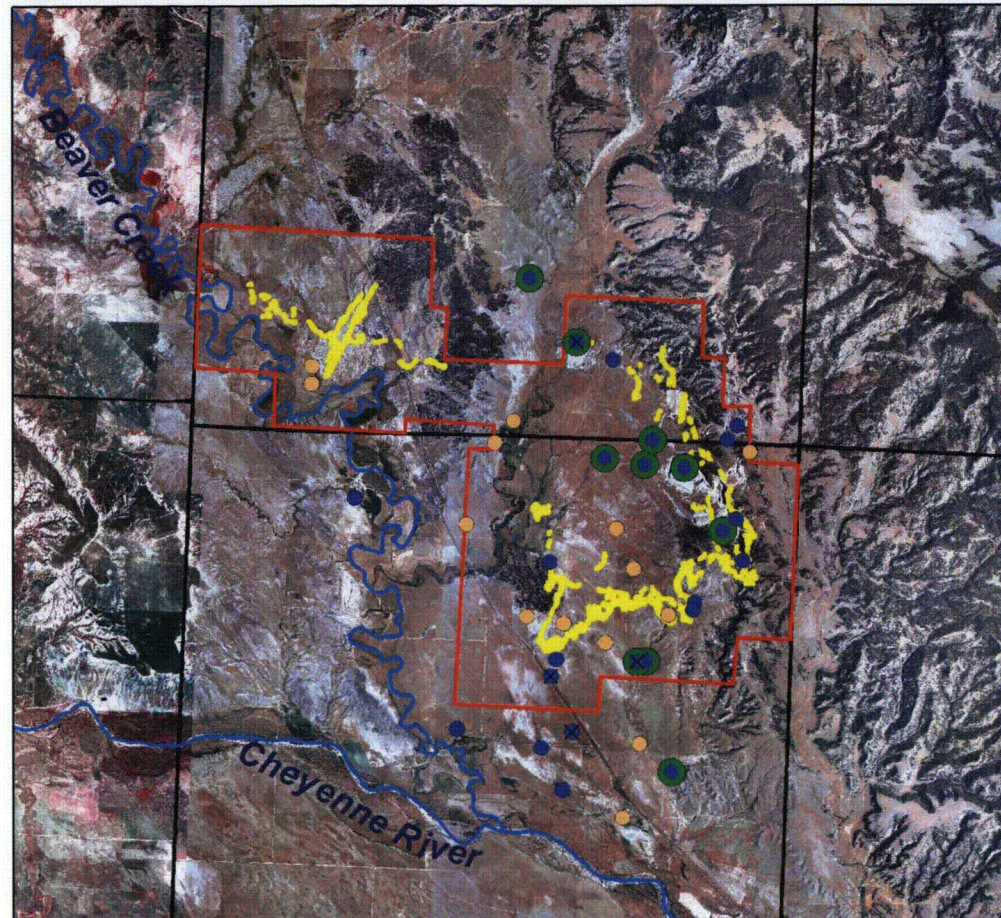
Surface Water

❖ Sampling

- ***Upstream/downstream on Beaver Creek (monthly) and Cheyenne River (quarterly)***
 - ☞ Real-time measure stage
 - ☞ Collect grab samples at least monthly and during representative storms (24 samples)
- ***Storm samples on intermittent streams, upstream/downstream Pass Creek and Bennett Canyon and one unnamed tributary***
 - ☞ Measure storm flows
 - ☞ Collect grab samples (12 samples maybe)
- ***Quarterly sample representative surface water impoundments and abandon pit mine***
 - ☞ Field-measure specific conductance, temperature, turbidity, pH
 - ☞ Collect grab samples (48 samples)
- ***Chemical analyses***
 - ☞ Same as groundwater with the addition of fecal coliform bacteria, total suspended solids, and suspended solids concentration because of Beaver Creek impairment listing

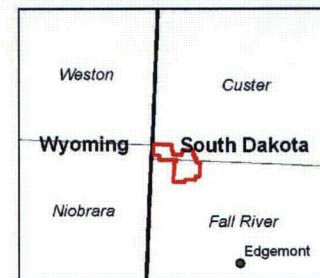
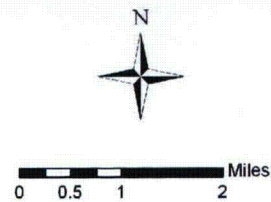


Surface Water Impoundment Sampling Sites

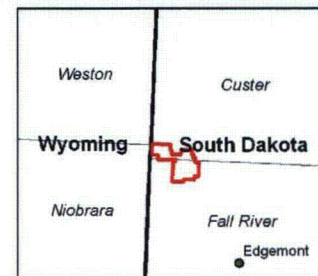
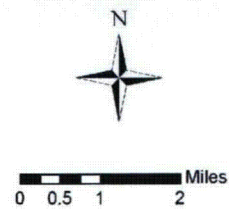
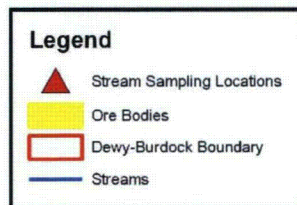
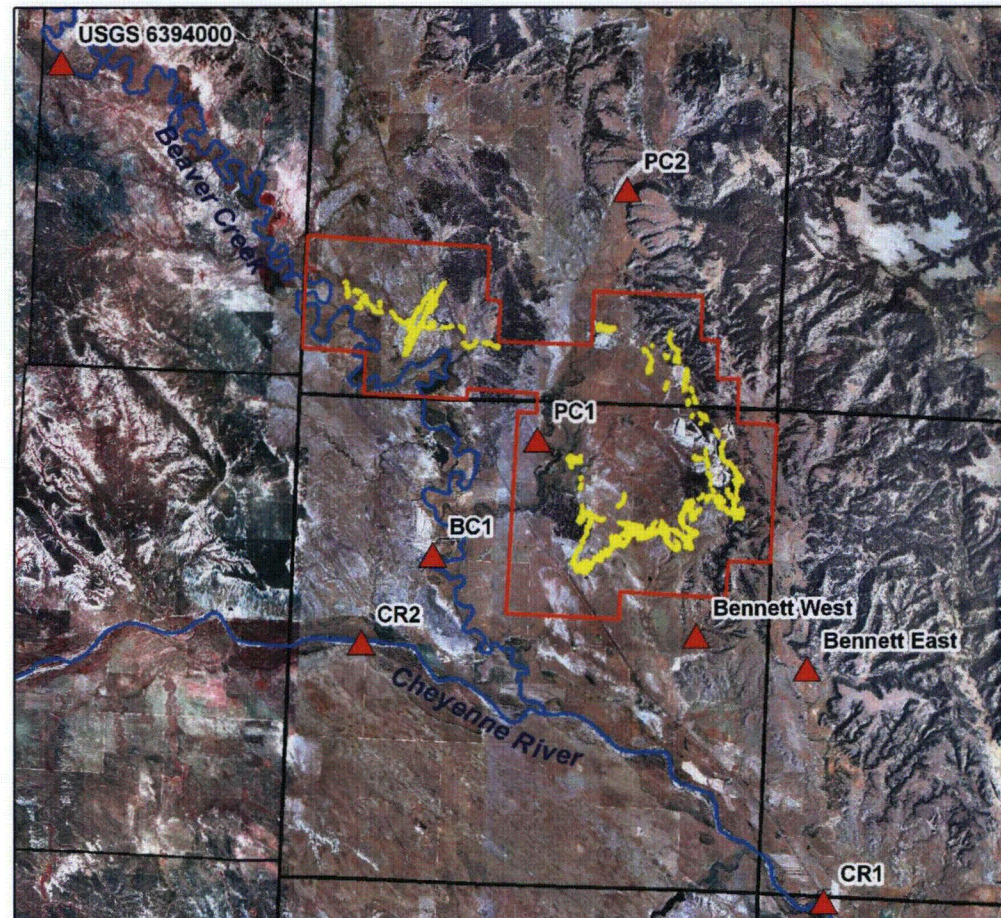


Legend

- Surface Impoundments
- Dry Impoundments
- Impoundments Influence by Springs
- Proposed Impoundment Sample Sites
- Ore Bodies
- Devy-Burdock Boundary
- Streams



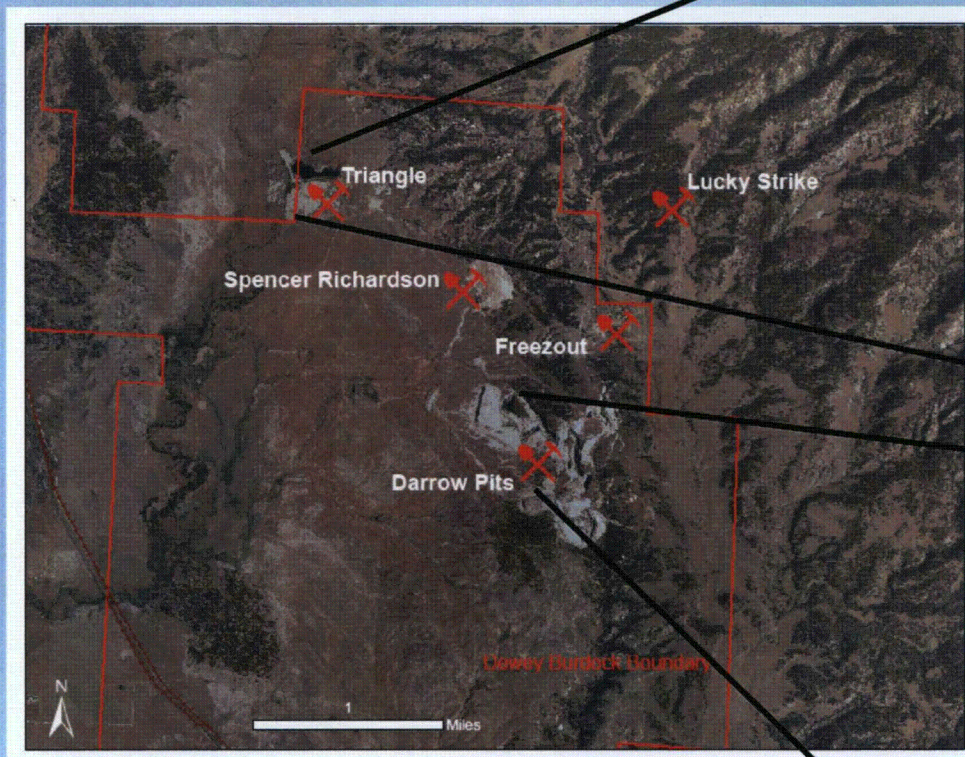
Surface Water Stream Sampling Sites



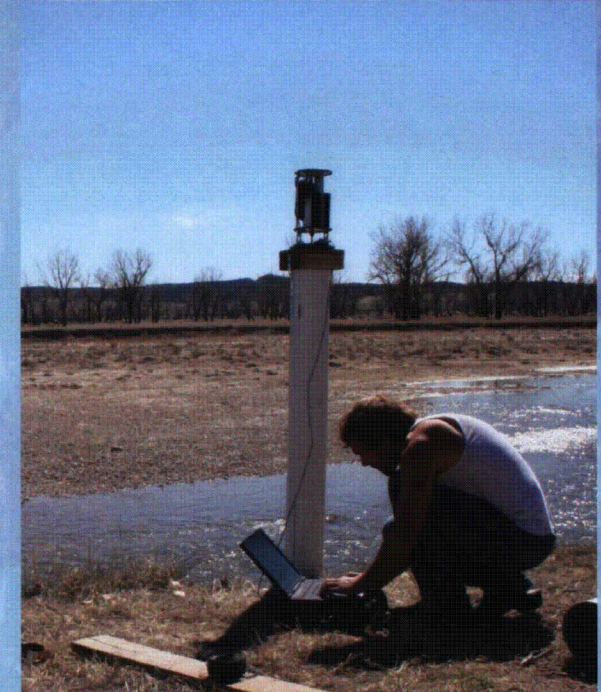
Surface Water



Pre-Existing Mine Sites

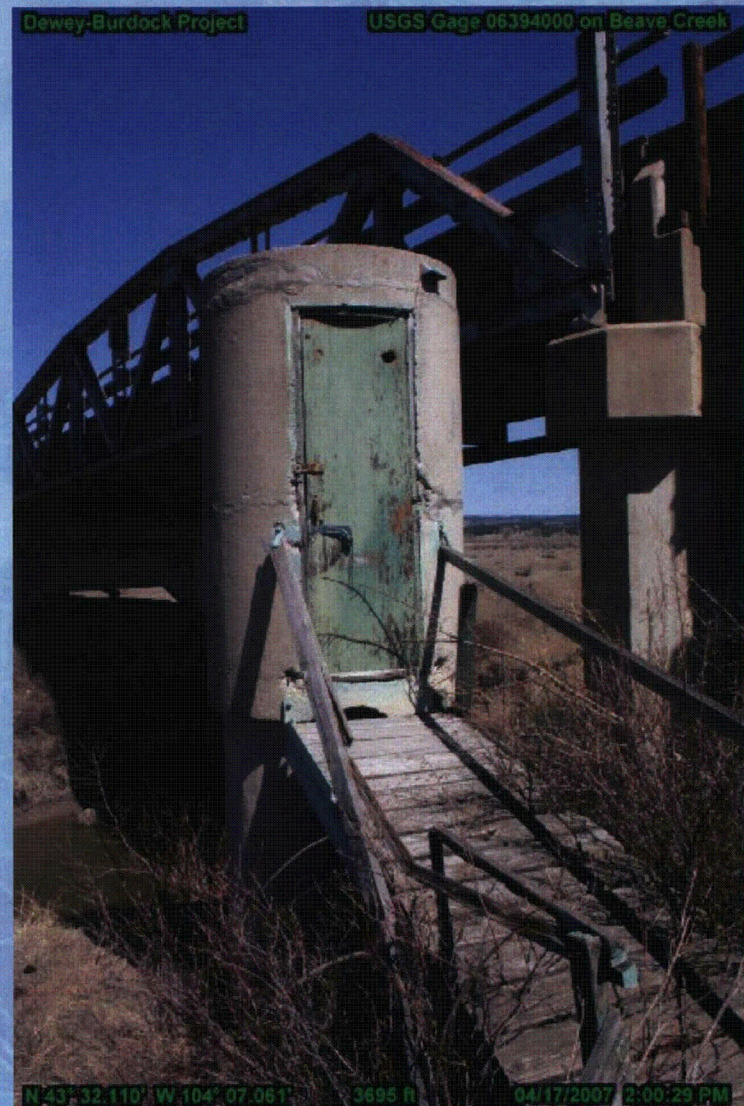


Passive Sediment Sampler With Stage Recorder



POWERTECH (USA) INC.

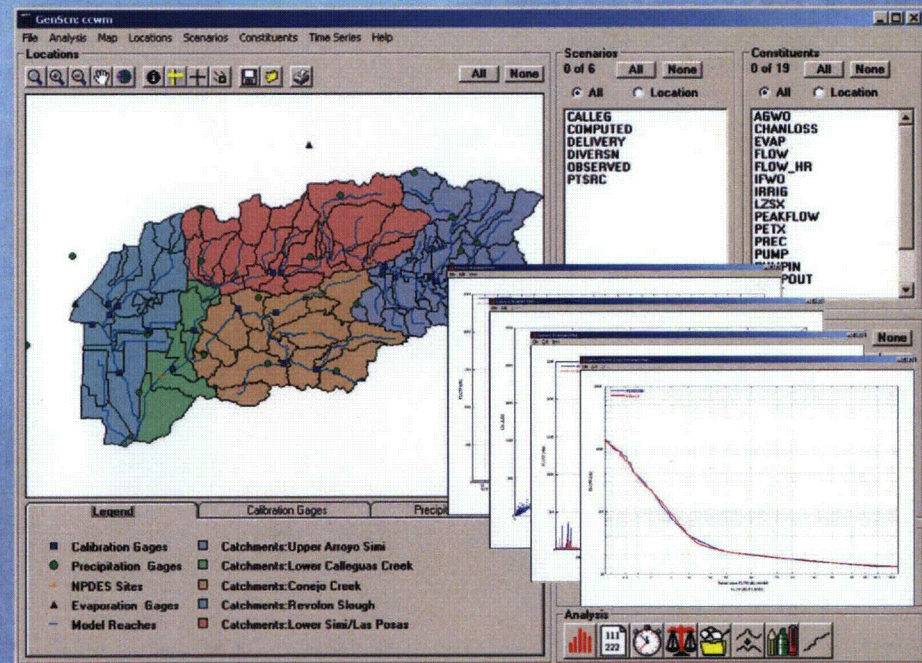
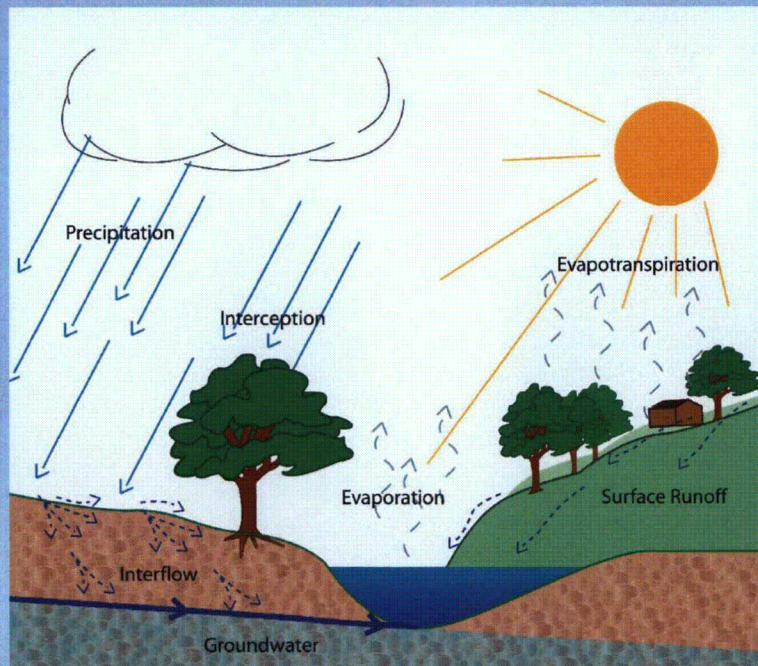
Site Sampling Locations

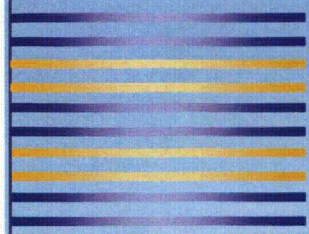


Surface Water

❖ Model

➔ *HEC-HMS and HEC RAS - Flood Plain Model*





Meteorology

❖ In Cooperation with South Dakota State climatologist Dr. Dennis Todey

❖ Full MET station

- *Wind speed/direction*
- *Solar radiation*
- *Humidity*
- *Temperature*
- *Year-round precipitation*
- *Evaporation*
- *Soil temperature*

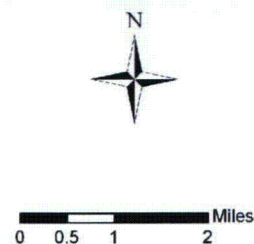
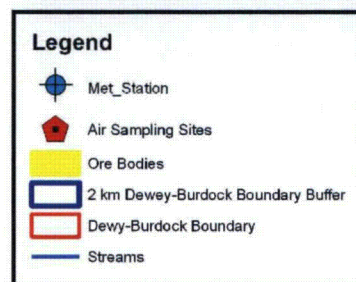
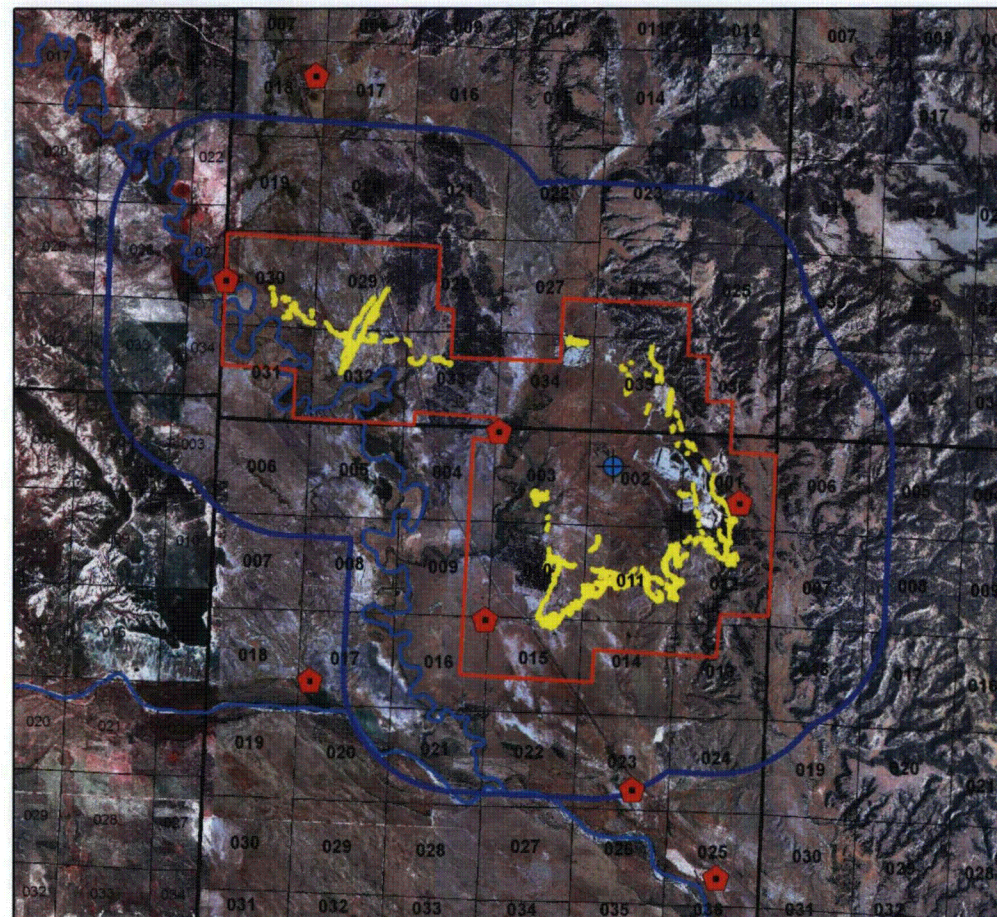


Radiological Baseline Study

- ❖ **Establish Environmental Monitoring Stations**
- ❖ **Collect Baseline Samples/Radiological Analysis**
- ❖ **Deploy Radon and Direct Radiation Detectors**



Meteorological and Radiological Air Quality Sampling Sites



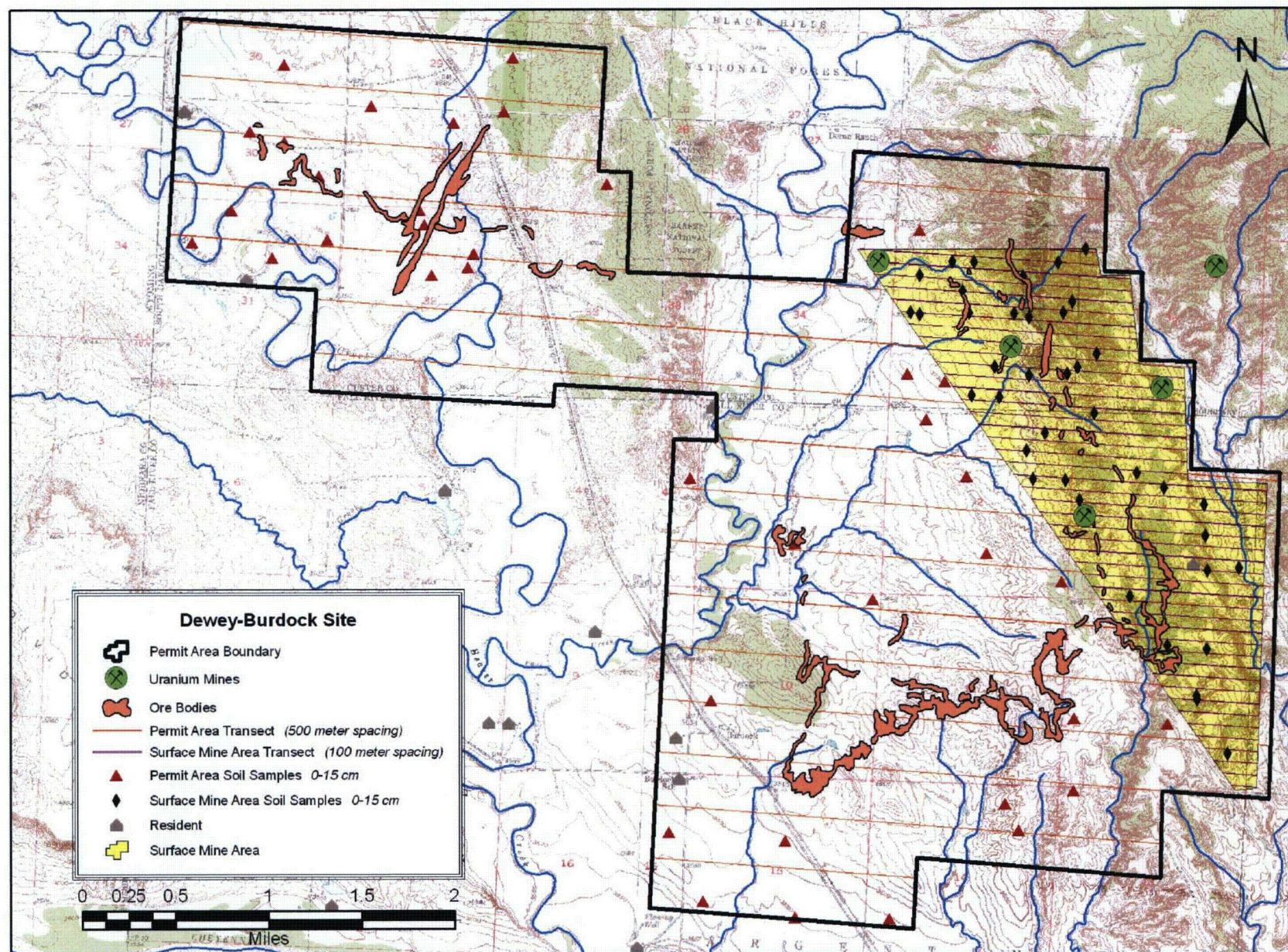


Figure 4.1 Surface Soil Sampling Locations and Gamma Survey Transects

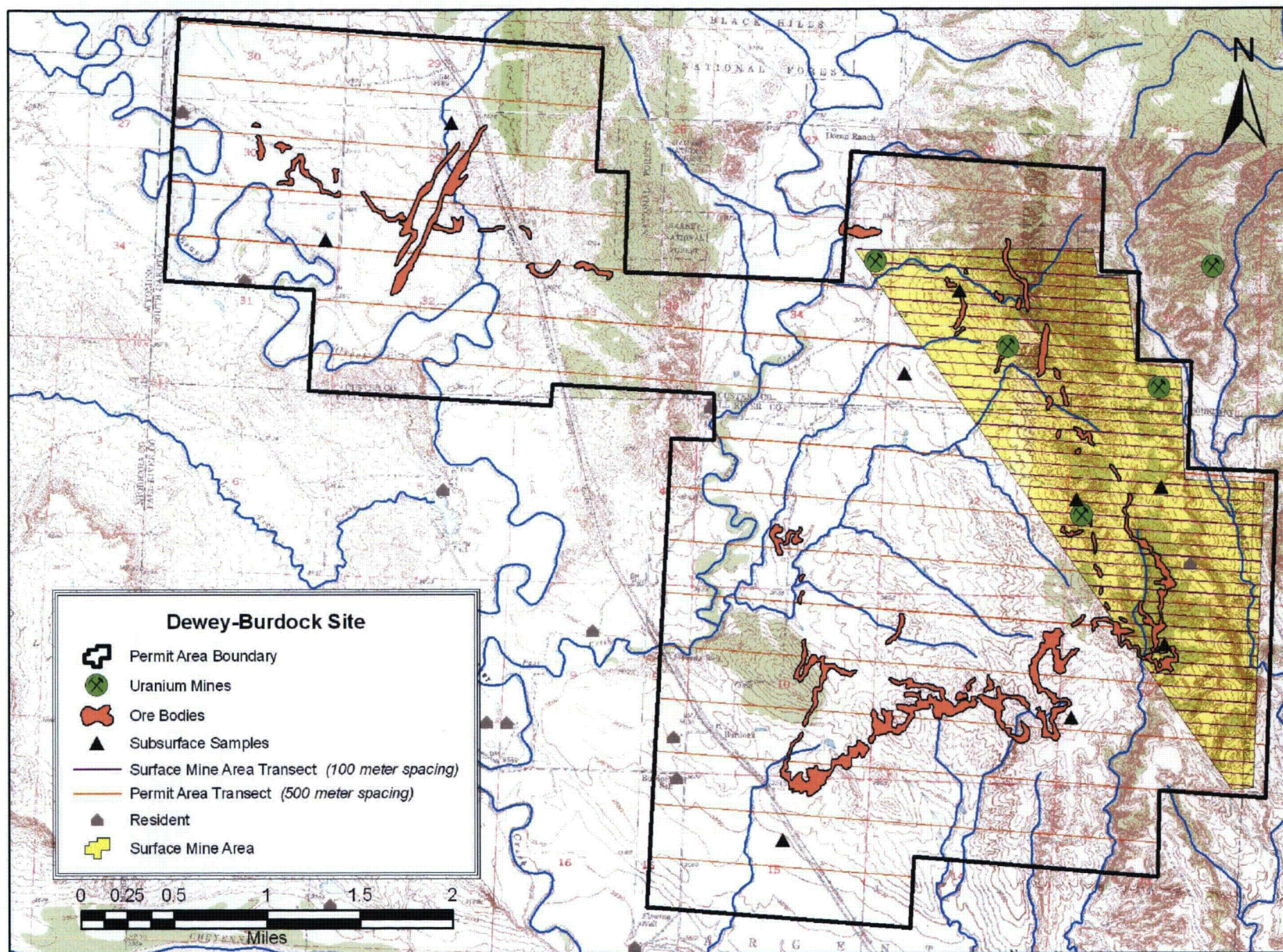


Figure 4.2 Subsurface Soil Sampling Locations and Gamma Survey Transects



Baseline Radiation

❖ Radiological measurements and samples

- *Air particulate concentrations at 8 hi-vol monitoring station locations*
- *Mine Area: 40 soil samples at 0-15 cm; GPS gamma survey at 100m intervals; direct gamma measurements at 40 soil sampling locations*
- *Remaining Area: 40 soil samples at 0-15cm; GPS gamma survey at 500m intervals; direct gamma measurements at 40 soil sampling locations*
- *Surface soils at 0-5cm at hi-vol stations*
- *Subsurface soil composites (9 random locations) at 15-30cm & 30-100cm depths*





Baseline Radiation

❖ Radiological measurements and samples

- *Ambient radon in air concentrations (8 + 8)*
- *Direct radiation (8 TLD at hi-vol locations + HPIC exposure rate measurements)*
- *Radon flux (9 measurements x 3 months)*
- *Surface water and sediment*
- *Vegetation (3 times), food (once), and fish (4 times – per GFP requirement)*
- *Laboratory analysis per Reg Guide 4.14*





Additional Radiological Tasks

- ❖ Develop HPIC/surface soil Ra-226 correlation
- ❖ Develop GPS gamma/HPIC correlation
- ❖ Convert GPS gamma to Ra-226 and exposure rate for risk assessment
- ❖ MILDOS-AREA modeling
 - ➔ *Off-site dose assessment*
- ❖ Worker dose assessment
- ❖ Radiation protection plan
- ❖ Environmental monitoring plan
- ❖ Accident scenario/assessment
- ❖ Decommissioning plan



Baseline Ecology

❖ Vegetation

- *Historical data review*
- *Tree & shrub density cover sampling*
- *Dominant vegetation community sampling*
- *Threatened and Endangered Survey*

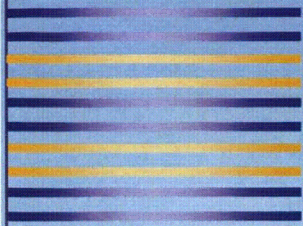
❖ Soils

- *Review historical soil mapping*
- *Conduct soil survey/sampling*
- *Complete soil mapping*

❖ Wetlands

- *National wetland inventory review*
- *Delineate wetland areas*
- *Prepare mapping*



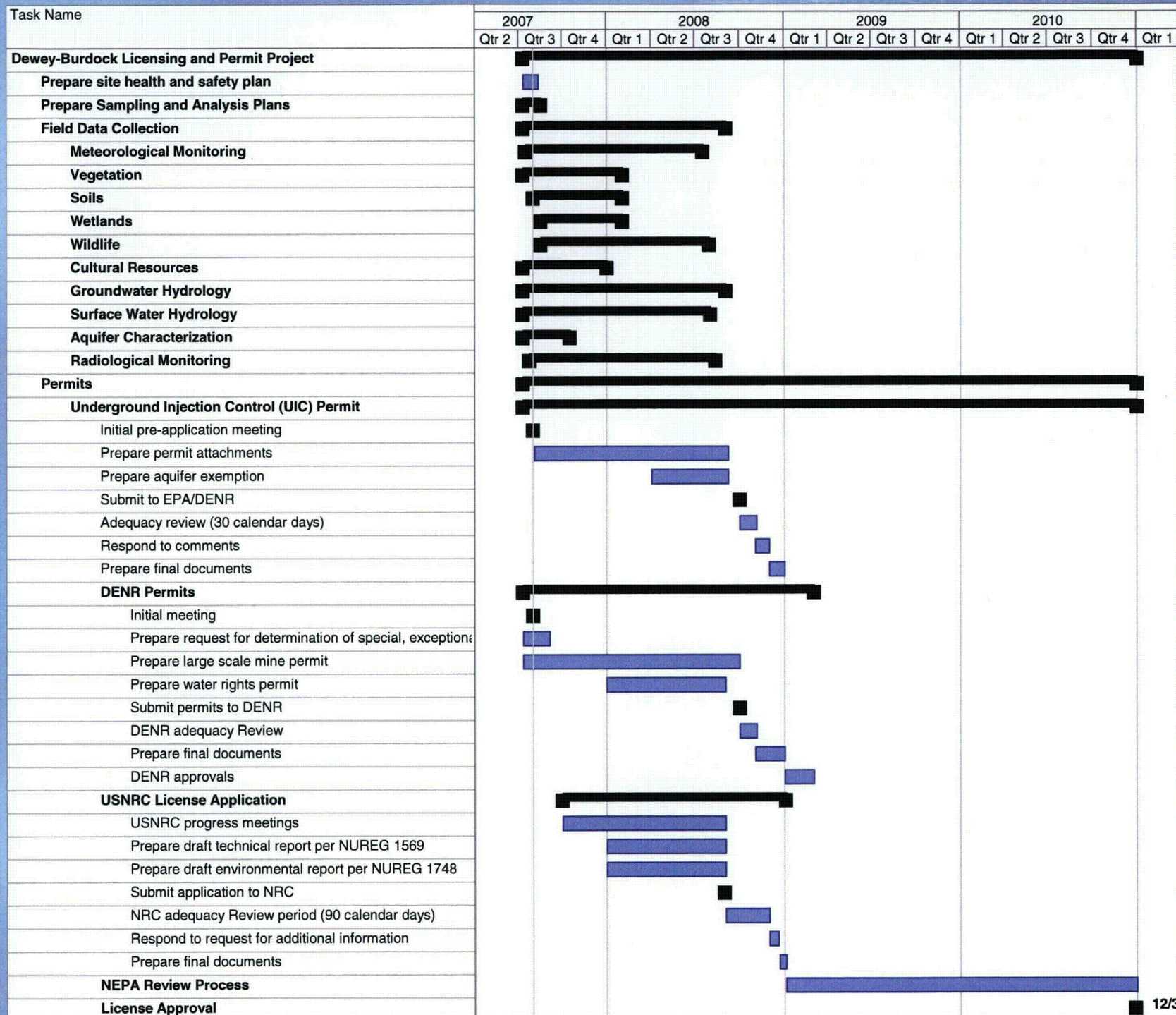


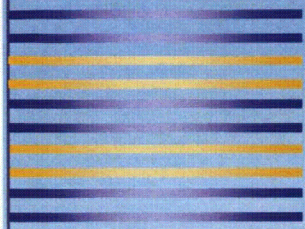
Baseline Ecology

❖ Wildlife Surveys

- *Threatened and Endangered Species*
- *Upland game birds*
- *Breeding birds*
- *Big game species*
- *Raptors*
- *Fisheries/Invertebrates*
- *Small mammal trapping*
- *Stream Characterization*







Summary

- ❖ **Hired experienced team to support licensing/permitting efforts with USNRC, USEPA and SD DENR**
- ❖ **Environmental baseline monitoring program is ongoing**
- ❖ **Powertech desires to maintain routine contact with USNRC URB staff**
- ❖ **Submit Source Materials License application in 3rd or 4th quarter 2008**

