SHEEP MOUNTAIN URANIUM PROJECT
CROOKS GAP, WYOMING

TSX-V : TUE FRANKFURT : T4X

TITAN URANIUM USA INC

WWW.TITANURANIUM.COM

NRC Quarterly Update
September 8, 2010

Introductions

- **Brian Reilly** – Chairman & CEO
- **Chris Healey** – President & COO
- **Doug Beahm** – BRS Engineering
- **Toby Wright** – Wright Environmental Services
- **Tony Thompson** - Thompson & Pugsley
- **Chris Pugsley** - Thompson & Pugsley

Regulatory Contact and Communications

- Coordinating communications w\ NRC, BLM and State
- BLM:
  - Multiple meetings w\ Field Office (J.Kaminsky & Staff)
  - BLM HQ meeting 4/15/10
- State
  - Multiple meetings with WDEQ\LQD (J.Erickson & Staff)
- NRC
  - 4/15/10 Initial Meeting
  - 9/8/10 1st Quarterly Update
  - Quarterly Updates
  - Site Visit – TBD (March\April 2010)

NEPA Process With Multiple Agencies

- Interested in having a single NEPA Process
  - NRC Lead Agency
  - BLM, WLQD, others as Cooperating Agencies
- Existing MOU between NRC and BLM
- Robust EIS to satisfy mission of both agencies
- Simultaneous State\BLM and NRC submittals
- Possibly two statements of Purpose and Need due to different Agency missions
- This was done for HRI application with BIA and BLM as cooperating agencies in EIS

NEPA Process (continued)

- Scope of EIS Encompasses:
  - Mine (open pit and underground)
  - Heap Leach & Central Processing Plant
  - Ore buying program
  - Toll processing of resins and yellow slurry
- NRC issues license but no ROD
- BLM issues ROD
- State issues revision to Mine Permit 381C.

Internal License Application Peer Review

- Solicited four proposals, received three
- Initiating internal peer review early in application development

Pre-Operational Baseline Studies Status

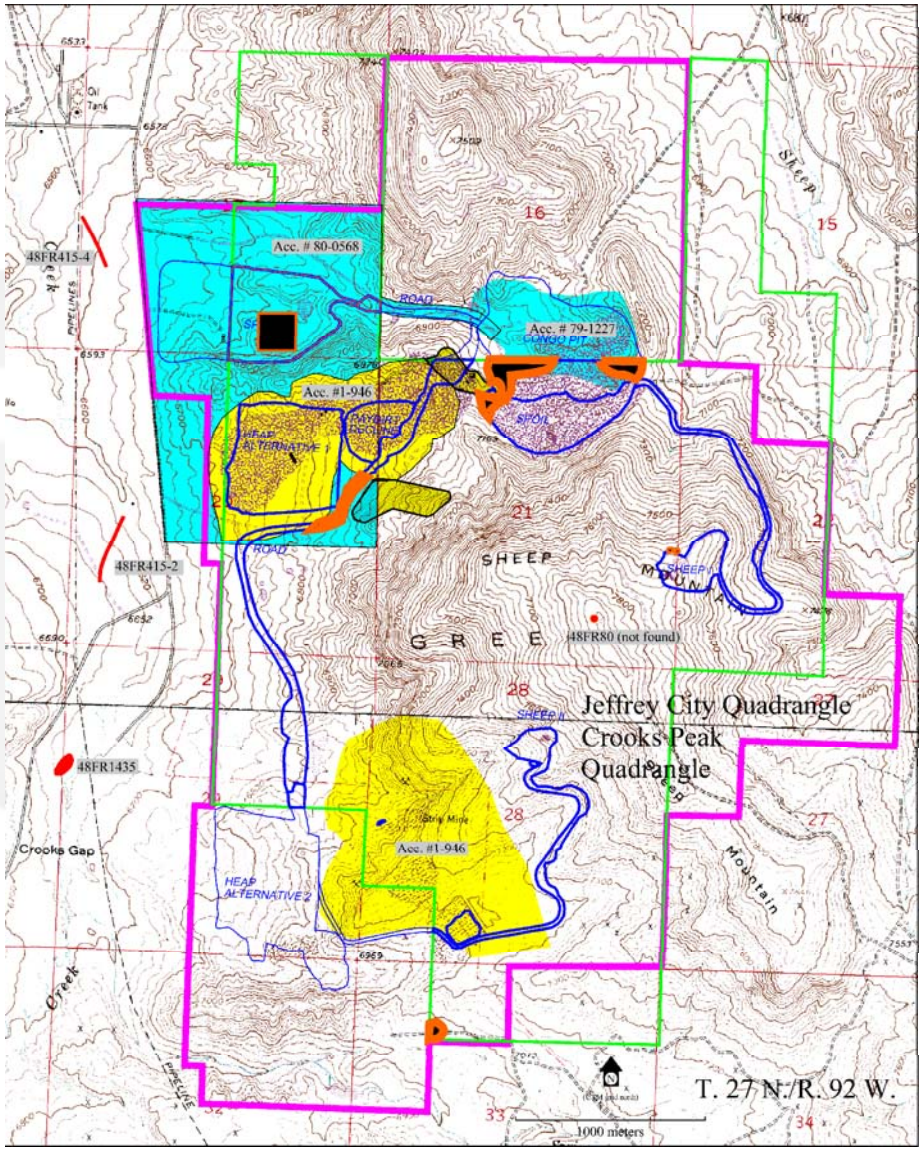
- Cultural Resources
- Wildlife
- Vegetation & Soils
- Surface Water
- Groundwater
- Radiological Characterization

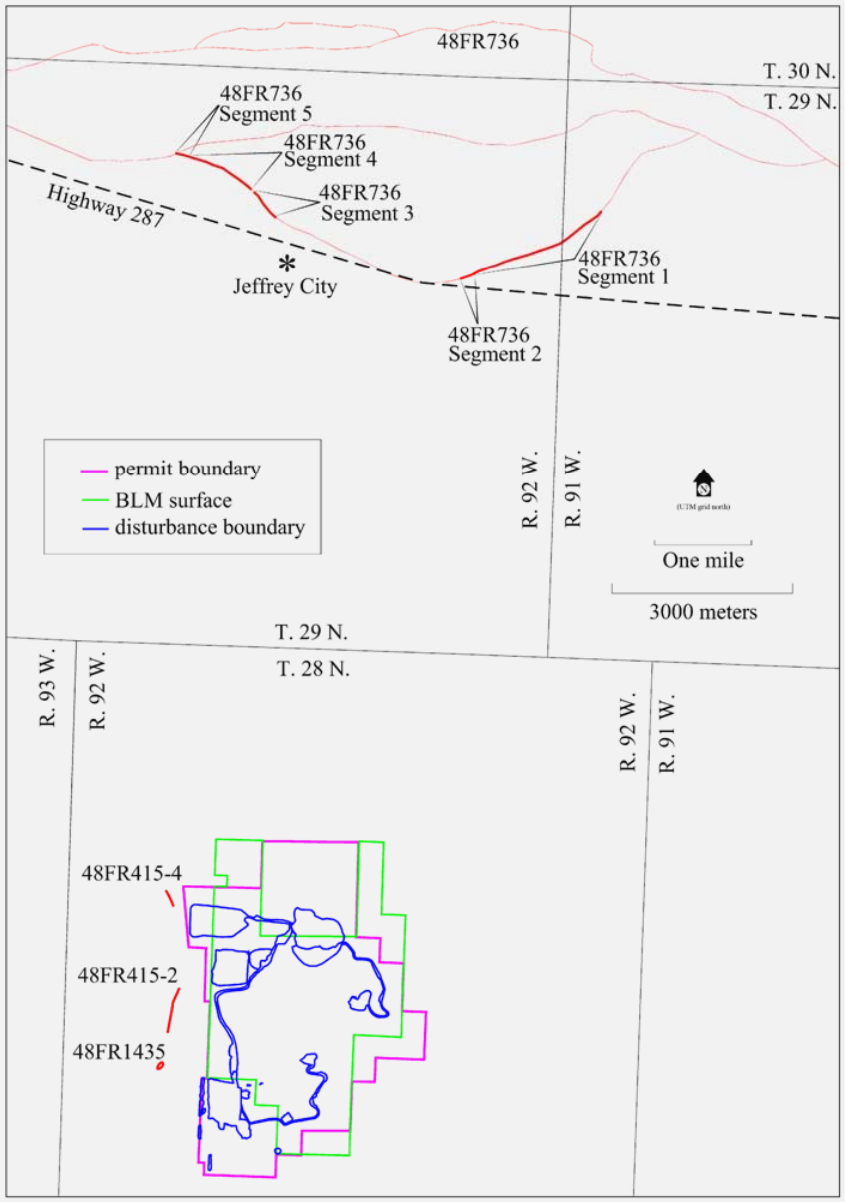
Cultural Resources

- Most of Project Area Previously Surveyed
- Most of Project Area Previously Disturbed
- No eligible sites within Project Area
- Visual Impacts Assessment
  - Impacts either absent or of limited significance due to existing impairments

Cultural Resources Surveys Previous & Recent

- permit boundary
- BLM surface
- total disturbance area
- disturbance within BLM
- previous inventory, pre-1981
- previous inventory, 1981 & later
- boundary between previous inventories
- LTA 2010 inventory





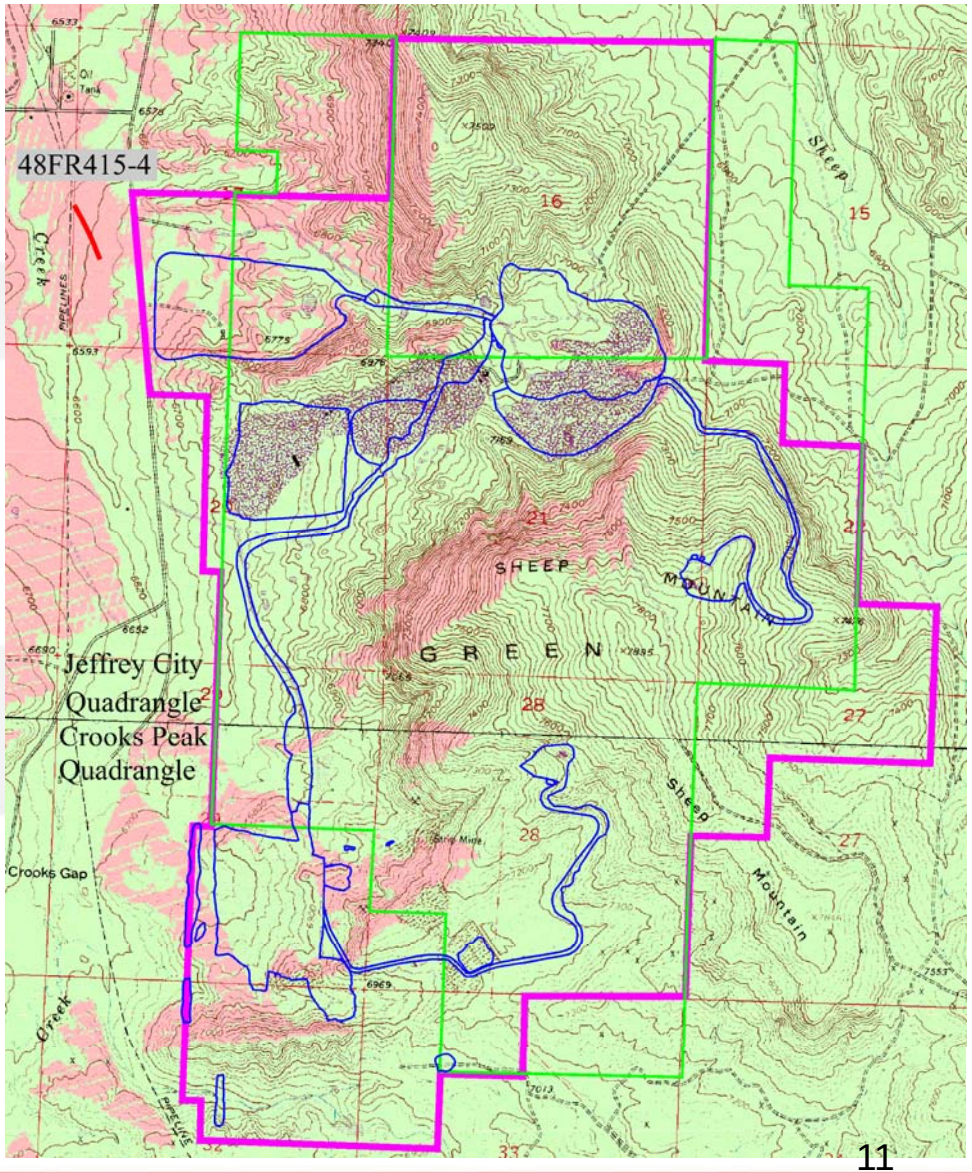
Contributing Segments:

- Oregon Trail
- Crooks Gap Stage Station
- Rawlins-Ft. Washakie Road

Performing Viewshed Analysis For All Contributing Segments

Preliminary Viewshed Analysis:

- Rawlins-Ft. Washakie Road, Segment 4 appears to be most impacted

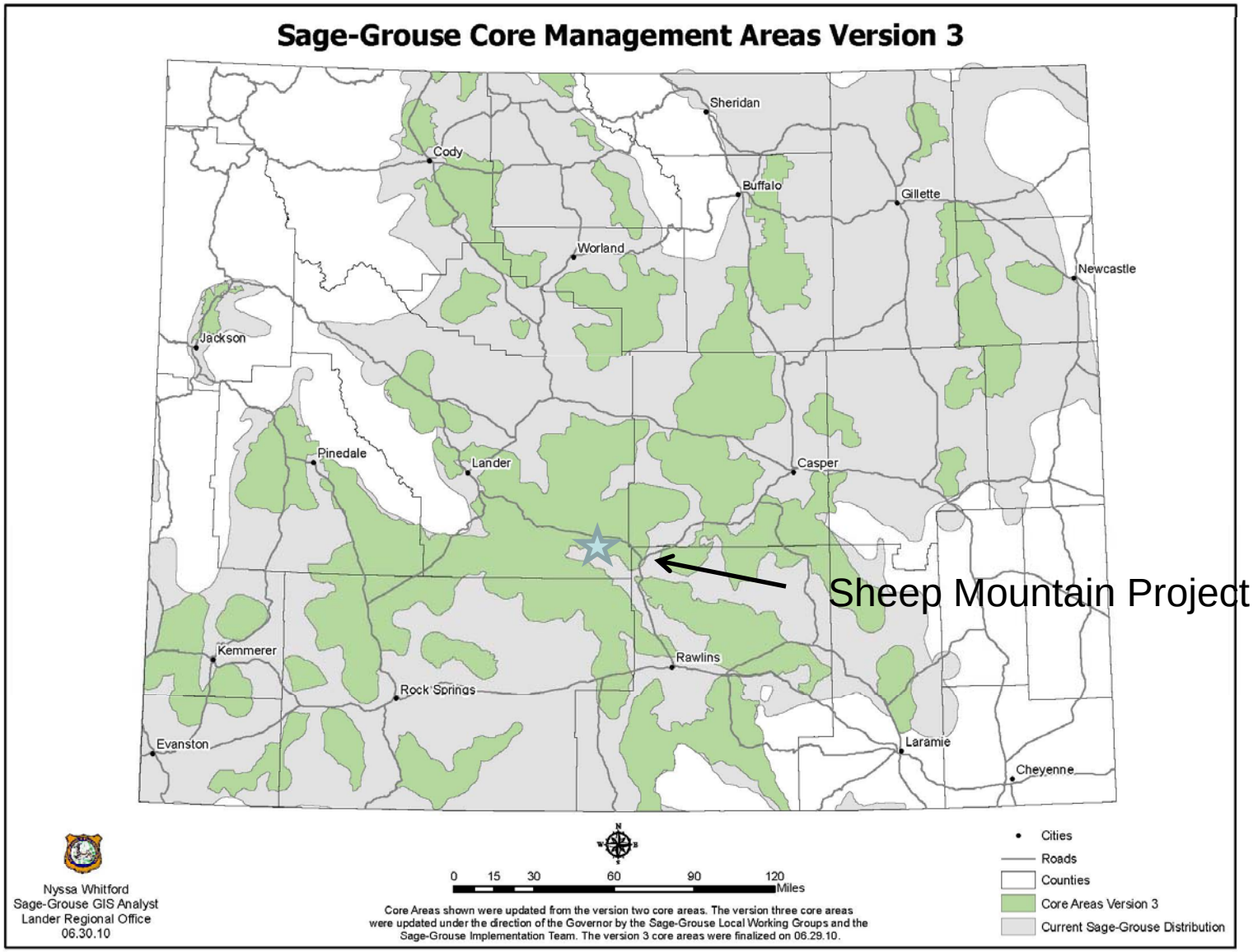


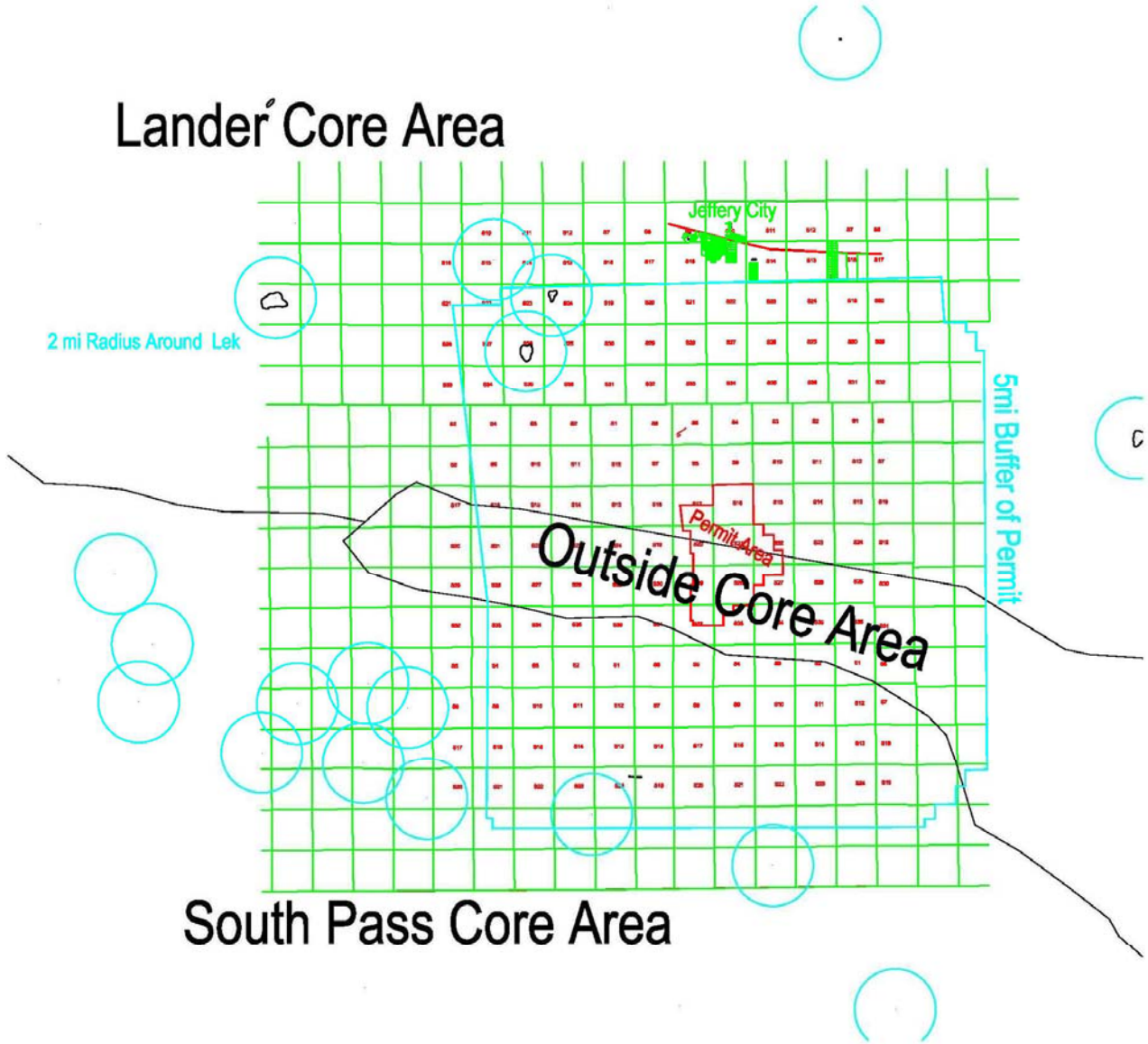
Rawlins-Ft. Washakie Road, Segment 4, east trace

Rawlins-Ft. Washakie Road, Segment 2 looking toward an existing haul road and drill roads

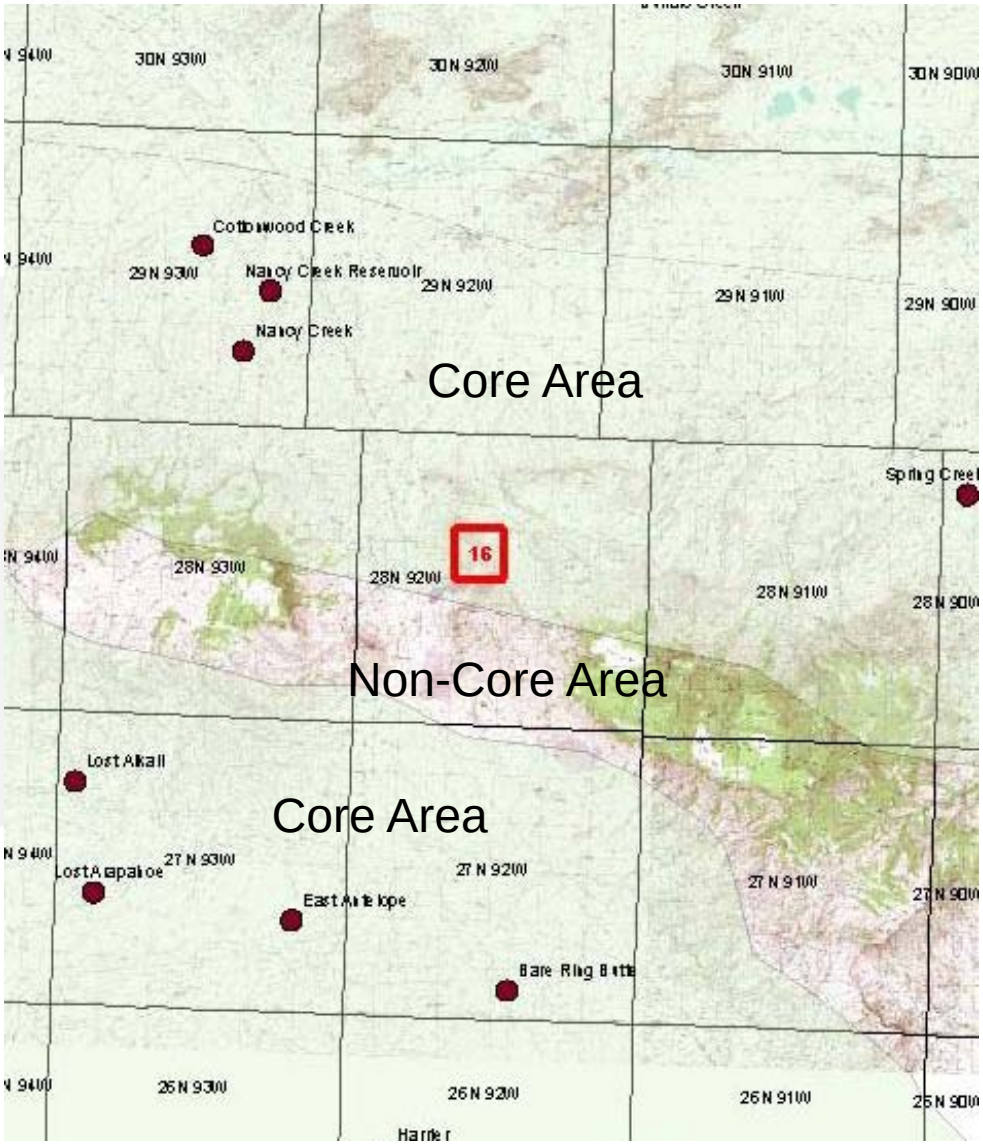
Wildlife

- Sage Grouse
  - Project Site partially in Core Area
    - Core area delineation rough, not consistent with detailed topography and available habitat
    - Exiting Mine Permit 381C area: 3,606 acres
      - 44% (1,587 acres) in delineated Core Area
      - 367 acres of planned mine and mill in delineated Core Area, of which 157 acres are already somewhat disturbed
  - Nearest Lek 6 miles away, visually isolated by mountain topography
  - No suitable habitat will be disturbed

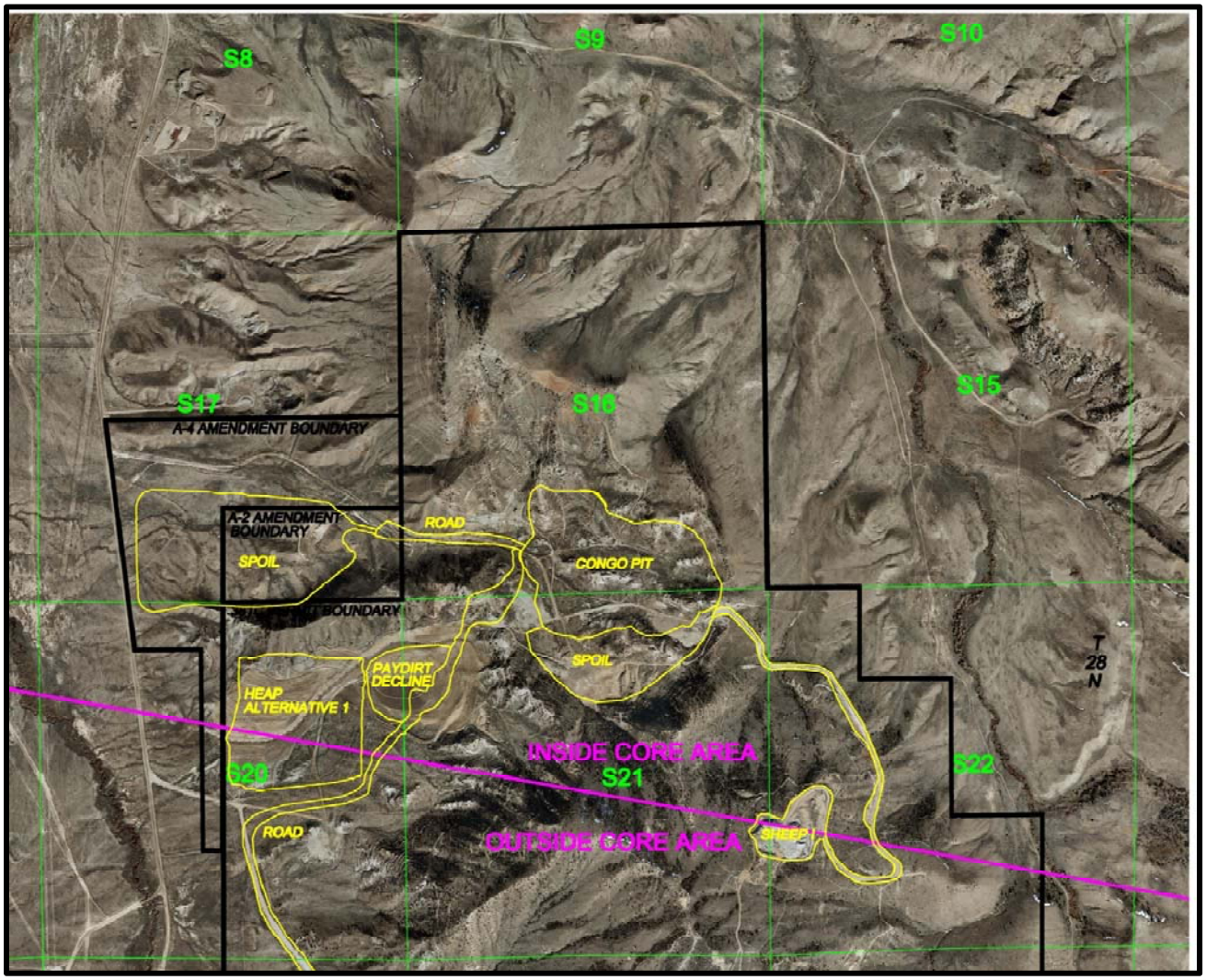

Sage-Grouse Core Management Areas Version 3
Sheridan
Cody
Buffalo
Gillette
Worland
Newcastle
Jackson
Pinedale
Lander
Casper
Sheep Mountain Project
Kemmerer
Rawlins
Rock Springs
Evanston
Laramie
Cheyenne
Nyssa Whitford
Sage-Grouse GIS Analyst
Lander Regional Office
06.30.10
0 15 30 60 90 120 Miles
Core Areas shown were updated from the version two core areas. The version three core areas were updated under the direction of the Governor by the Sage-Grouse Local Working Groups and the Sage-Grouse Implementation Team. The version 3 core areas were finalized on 06.29.10.
Cities
Roads
Counties
Core Areas Version 3
Current Sage-Grouse Distribution


Lander Core Area
Jeffery City
2 mi Radius Around Lek
5mi Buffer of Permit
Permit Area
Outside Core Area
South Pass Core Area

Sage Grouse Leks in the Project Area



Core area with proposed disturbance



Wildlife (Continued)

- Large Game Species winter range impacts need to be addressed
- Raptor surveys completed
  - Very low population identified
    - Two poor nests on permit area
    - One inactive nest in buffer area
    - One active GHO nest in buffer area
  - Some long-term surveys may be required
- All other songbird, waterfowl and small mammal surveys completed.

Wildlife (Continued)

- Fish tissue sampling not yet performed
  - Wyoming Game and Fish survey of Crooks Creek found one Brook Trout, a few Chubs, Suckers, Long-Nosed Dace.
    - Insufficient mass to achieve Reg. Guide 4.14 LLDs
  - Crooks Creek, though perennial, does not have any surface connection to Sweetwater River or any other surface water body.

Vegetation Characterization

- Threatened and Endangered Species Surveys:
  - No T&E species present
  - One BLM sensitive plant species found
    - *Pinus flexilus (*Limber Pine)
- 4 other BLM sensitive plant species have habitat present but no species were found.

Vegetation Characterization (continued)

- 3 Vegetation Sampling Events For Radionuclides As per Reg. Guide 4.14
  - July 18th through 20th
  - August 2nd and 3rd
  - August 16th and 17th
  - Sites were chosen downwind of the proposed facilities

Soils Characterization

- Baseline soil sampling on August 2-3, 2010
  - Congo Pit
  - Spoil and Heap Sites
  - Sheep Sites

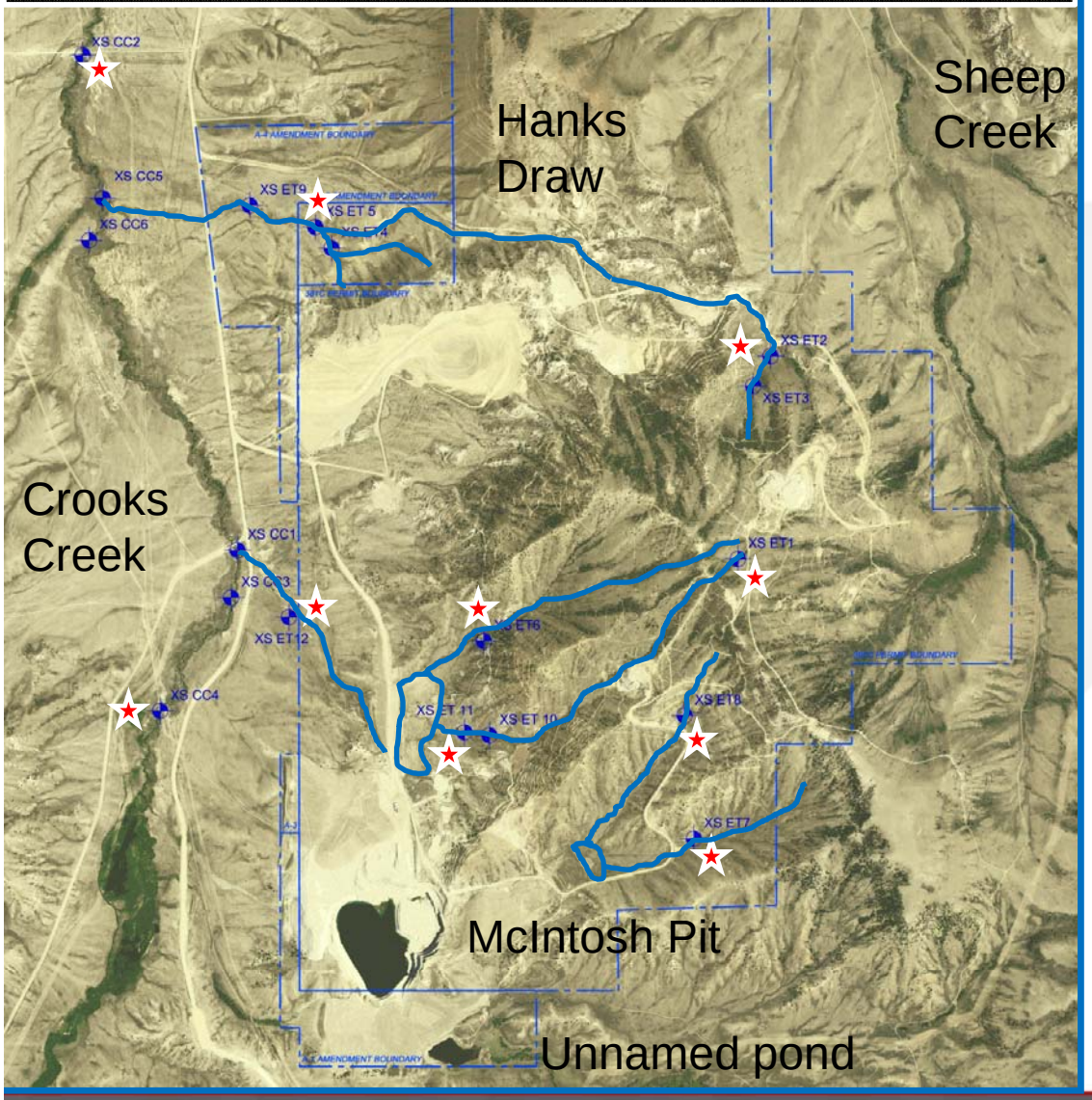
Surface Water & Sediment Characterization

- Flowing Surface Water Bodies
  - Crooks Creek (Off-Site to West)
  - Sheep Creek (Off-Site to East)
- Ponds & Impoundments
  - McIntosh Pit Lake
  - Unnamed southern pond
  - Two licensed Impoundments (ephemeral)
- Several Site Ephemeral Drainages

Surface Water & Sediment Characterization

- Crooks Creek
  - Monthly surface water quality samples
  - Quarterly flow measurement, will install permanent weir & gauging instrumentation
  - Sediment sampling complete
- McIntosh Pit Lake
  - Quarterly sampling
- Ephemeral Drainages
  - Surveyed numerous X-sections
  - Opportunistic surface water sampling of impoundments & ephemeral drainages when flowing

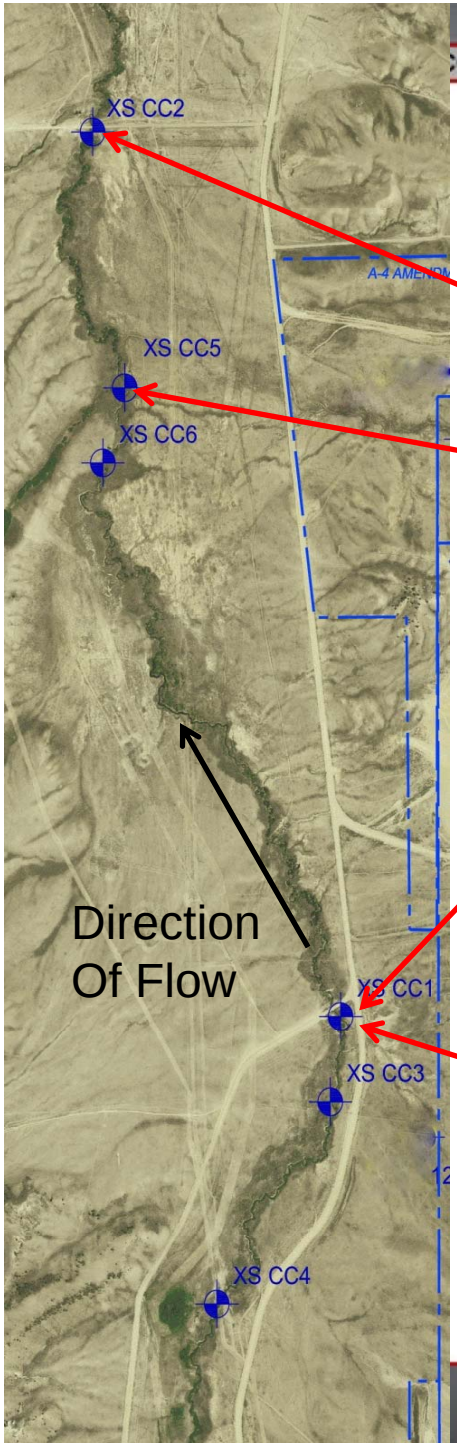
SURFACE WATER CROSS SECTION LOCATIONS



Surface Water Characterization Field Study Locations

- Surface Water and Sediment Sampling Locations
- Drainage X-section Survey Locations
- Major Site Drainages

★ NRC SEDIMENT SAMPLE



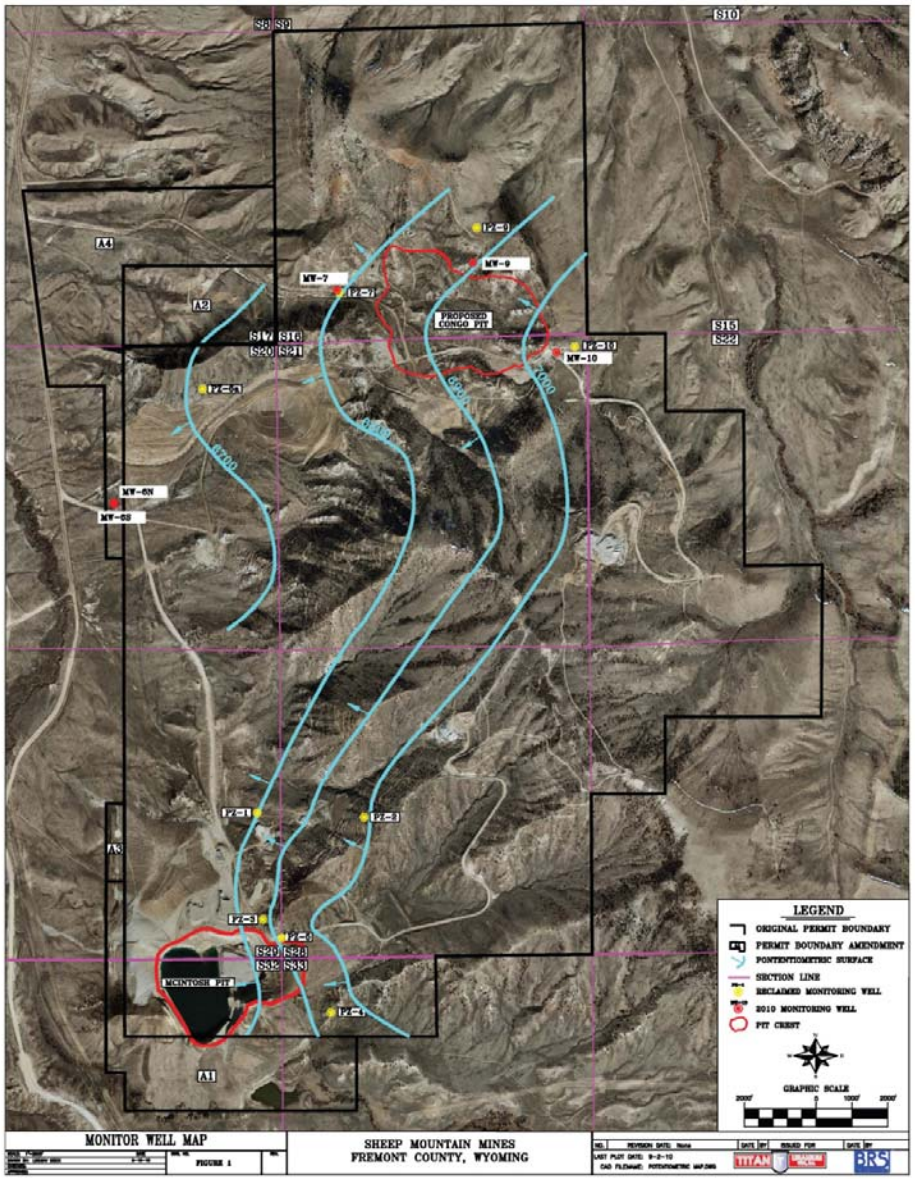
Crooks Creek

Cross Section	Date	Flow (cfs)
CC1	5/24/2010	6.8
CC1	6/16/2010	4.6
CC1	8/17/2010*	5.5
CC5	6/16/2010	4.8
CC2	6/16/2010	5.4
CC2	8/17/2010*	5.7

*Less than24 hours after a storm.

Groundwater Hydrogeology

- Historical Conceptual model
  - Battle Spring Fm. hosts upper most aquifer
    - Fine grained sandstone with discontinuous siltstone and claystone lenses
  - Recharge from northern hills
  - Regional discharge to Crooks Creek
- New Studies Ongoing
  - Replacing historical wells abandoned in 2001
  - Performing new aquifer tests



Confirming Historical Groundwater Hydrogeologic Model

- Drilling new monitoring wells
- Performing new aquifer testing

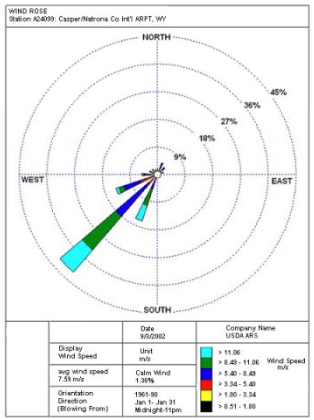
Baseline Radiological Characterization

- Air monitoring
  - Meteorological
    - Centrally located 10m tower
    - Instrumentation @ 2m and 10m
    - 2m & 10m: Temp, RH, pyrometer
    - 10m wind speed, wind direction
  - 5 High volume air samplers
    - Radioparticulates
    - Rn-222
    - Gamma radiation

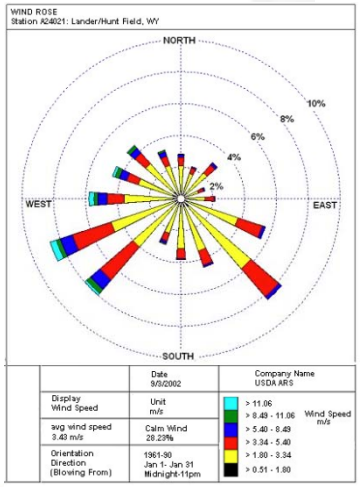
Nearest Resident

Air sampler locations:

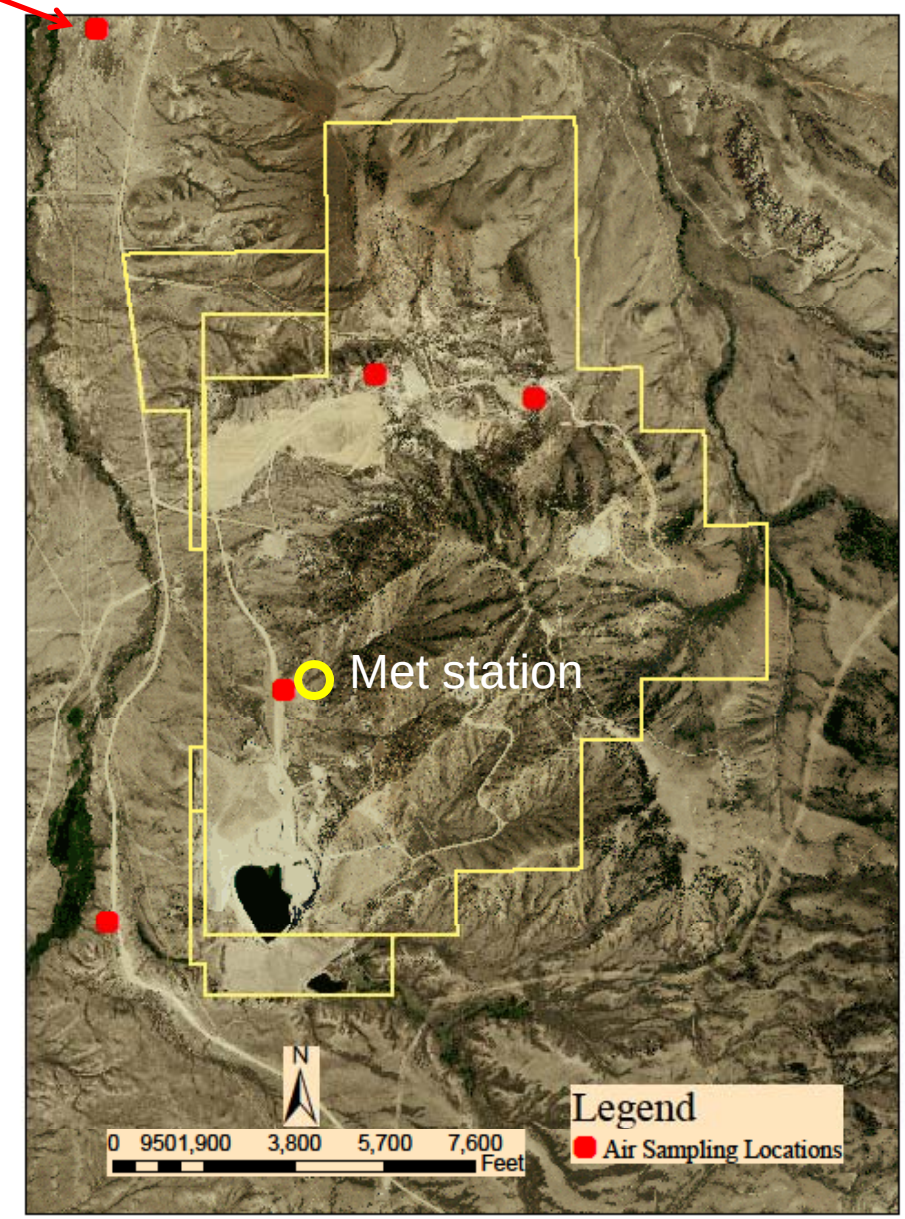
Additional monitoring locations once facilities location is finalized



Casper, Wyoming January wind rose, 1961-90.



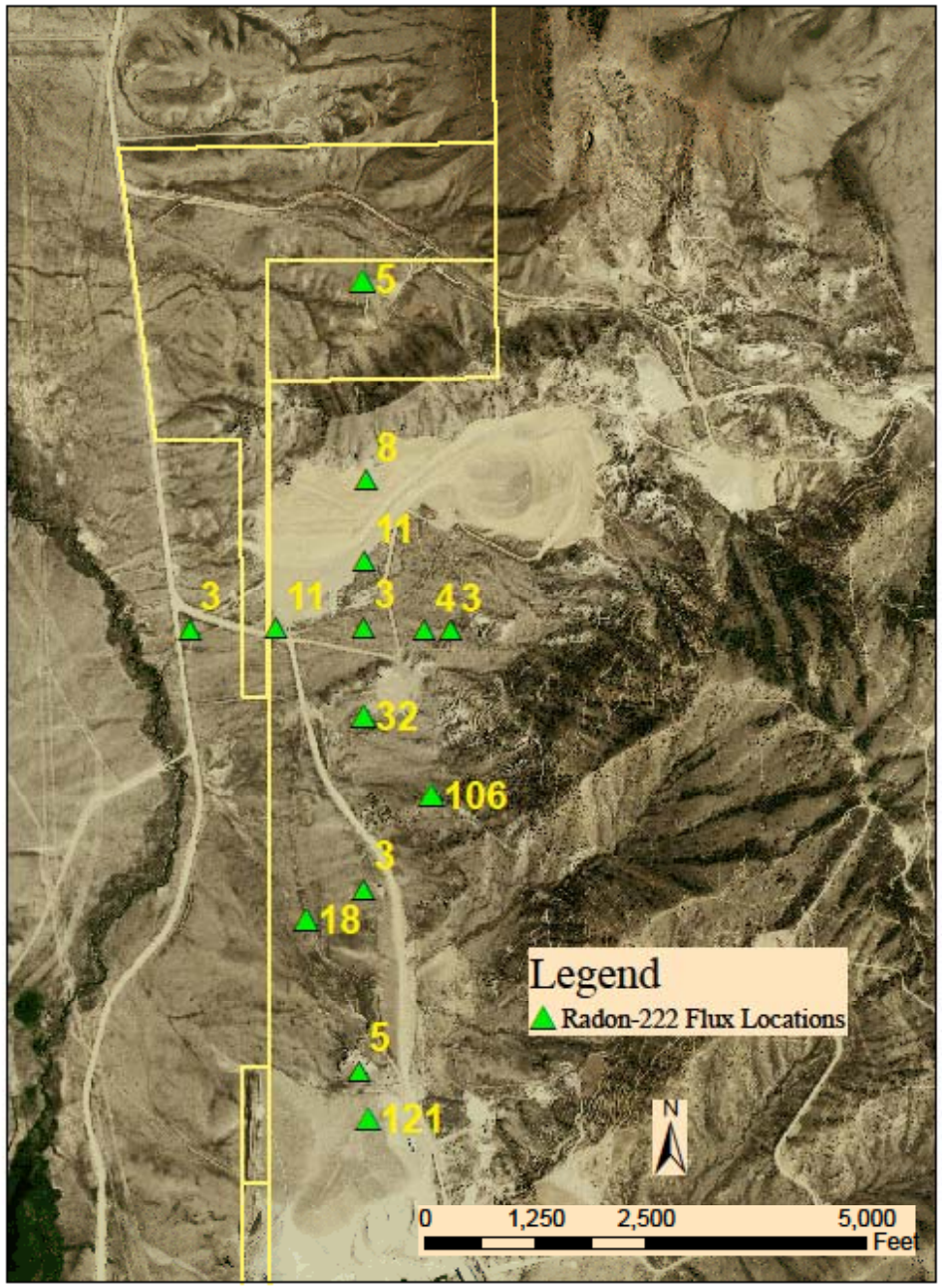
Lander, Wyoming January wind rose, 1961-90.



Radon-222 Flux

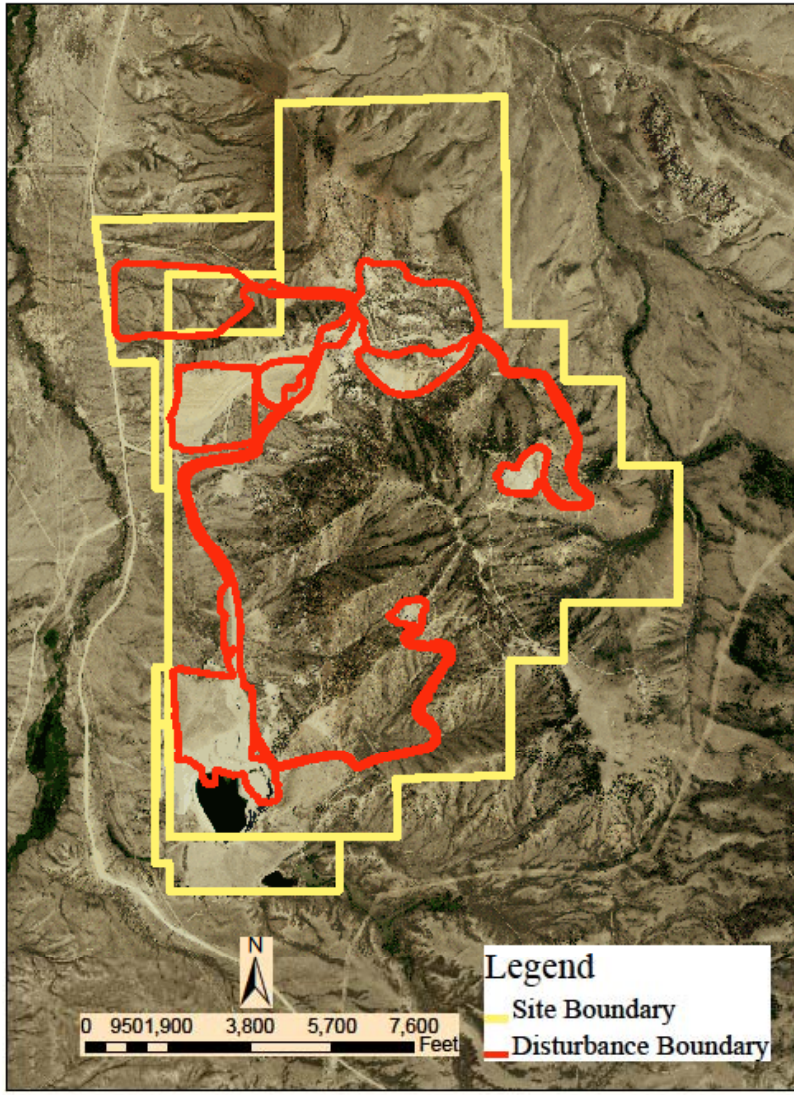
Canister results ($pCi/m^2/s$)

Two more data collection events this Fall

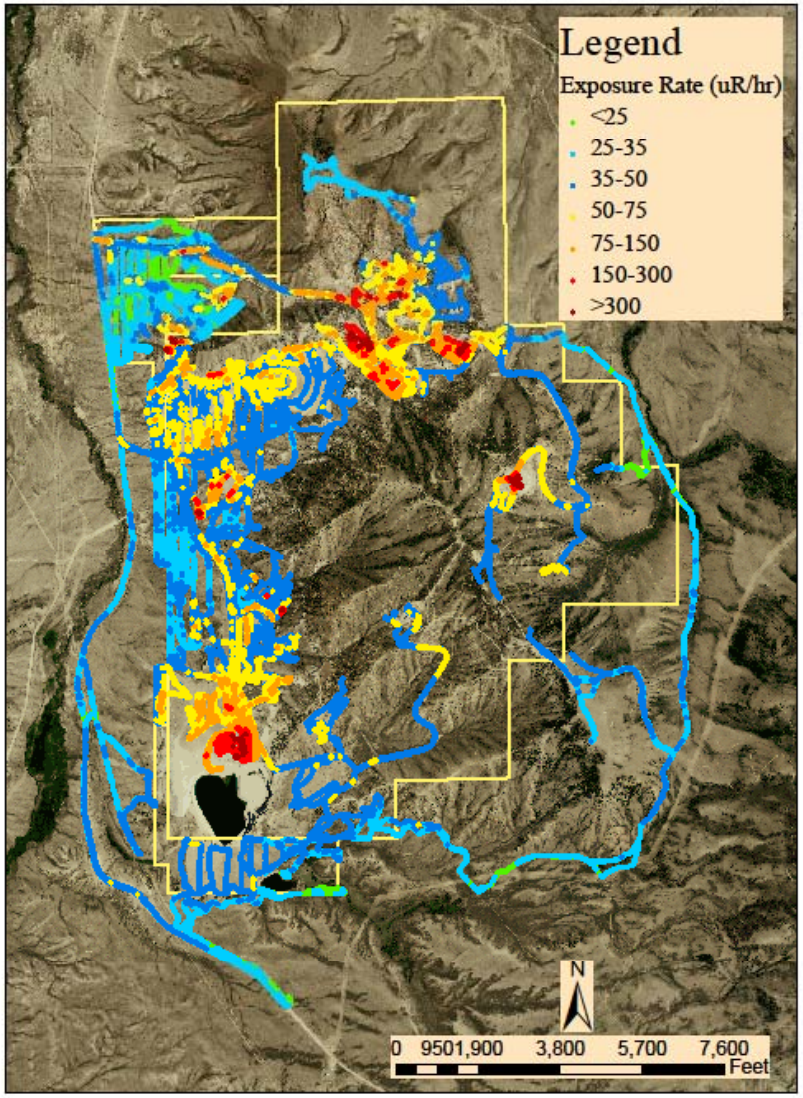


Gamma Radiation Survey

Permit Area & Proposed Disturbance



Gamma Radiation Scan



Sheep Mountain Uranium Project

Engineering Status

Proposed Operations

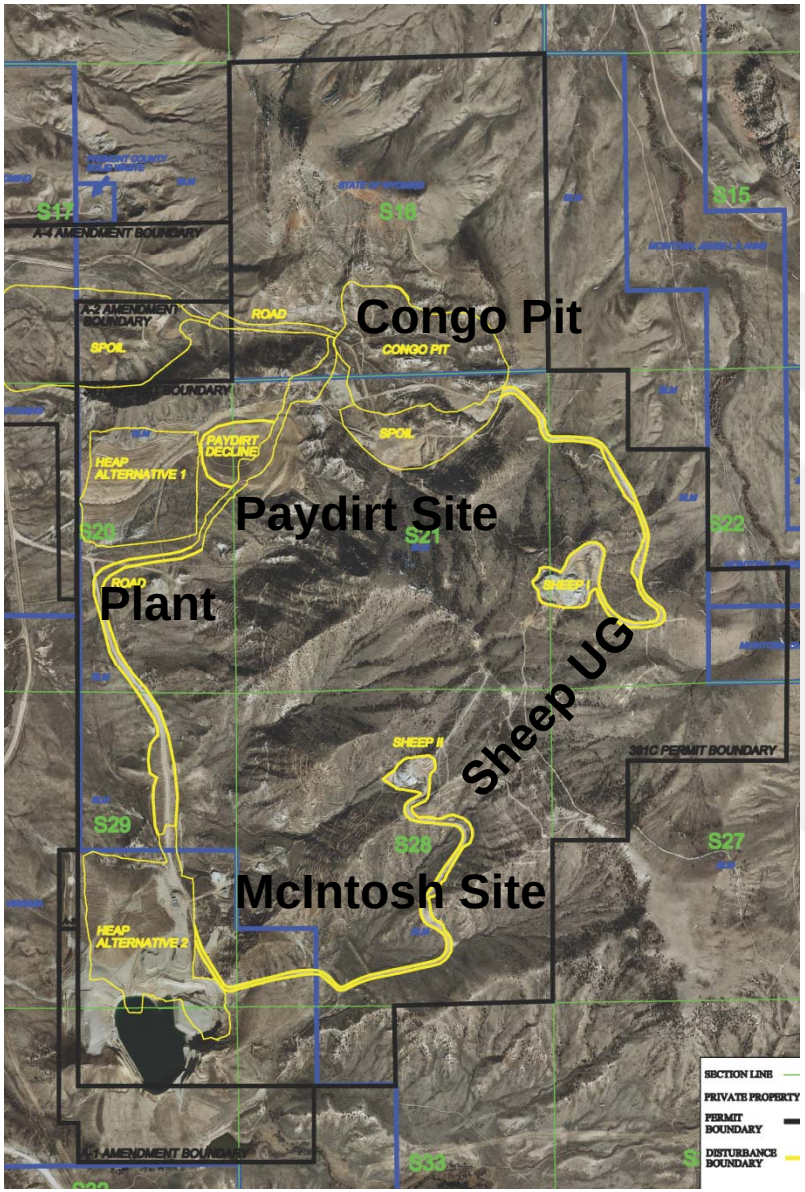
Proven Methods

- Conventional open pit
- Conventional underground operation
- Heap leach technology planned to extract uranium from ore
- Uranium recovery planned solvent extraction or ion exchange through to yellowcake

Total Probable Mineral Reserve

	Min GT	Pounds eU3O8	Tons	Ave grade %eU3O8
Congo Pit	0.10	4,938,000	2,895,000	0.085
Sheep UG	0.45	9,248,000	3,498,000	0.132
Total		14,186,000	6,393,000	0.111

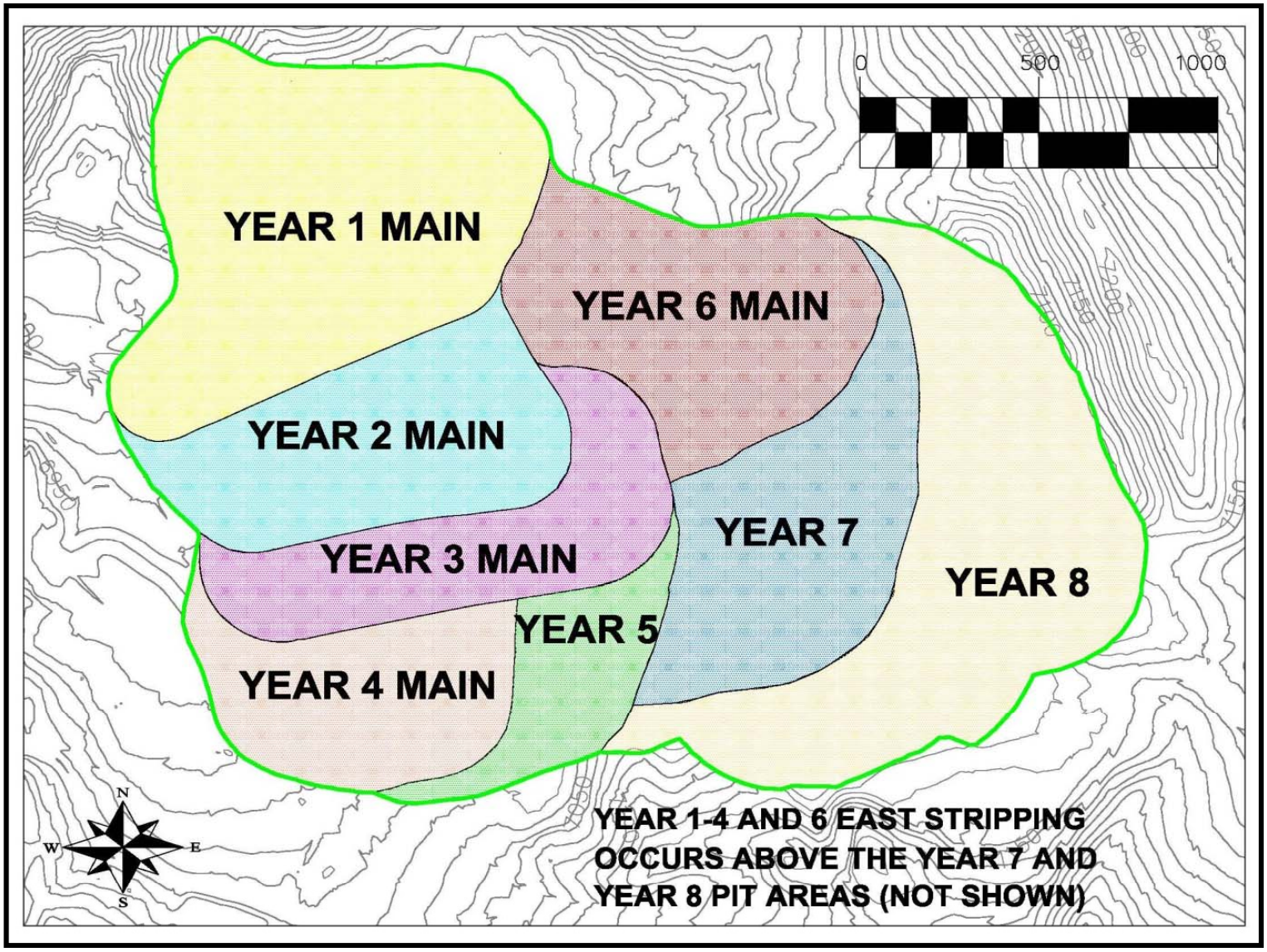
Recoverable - 12,908,000 Pounds

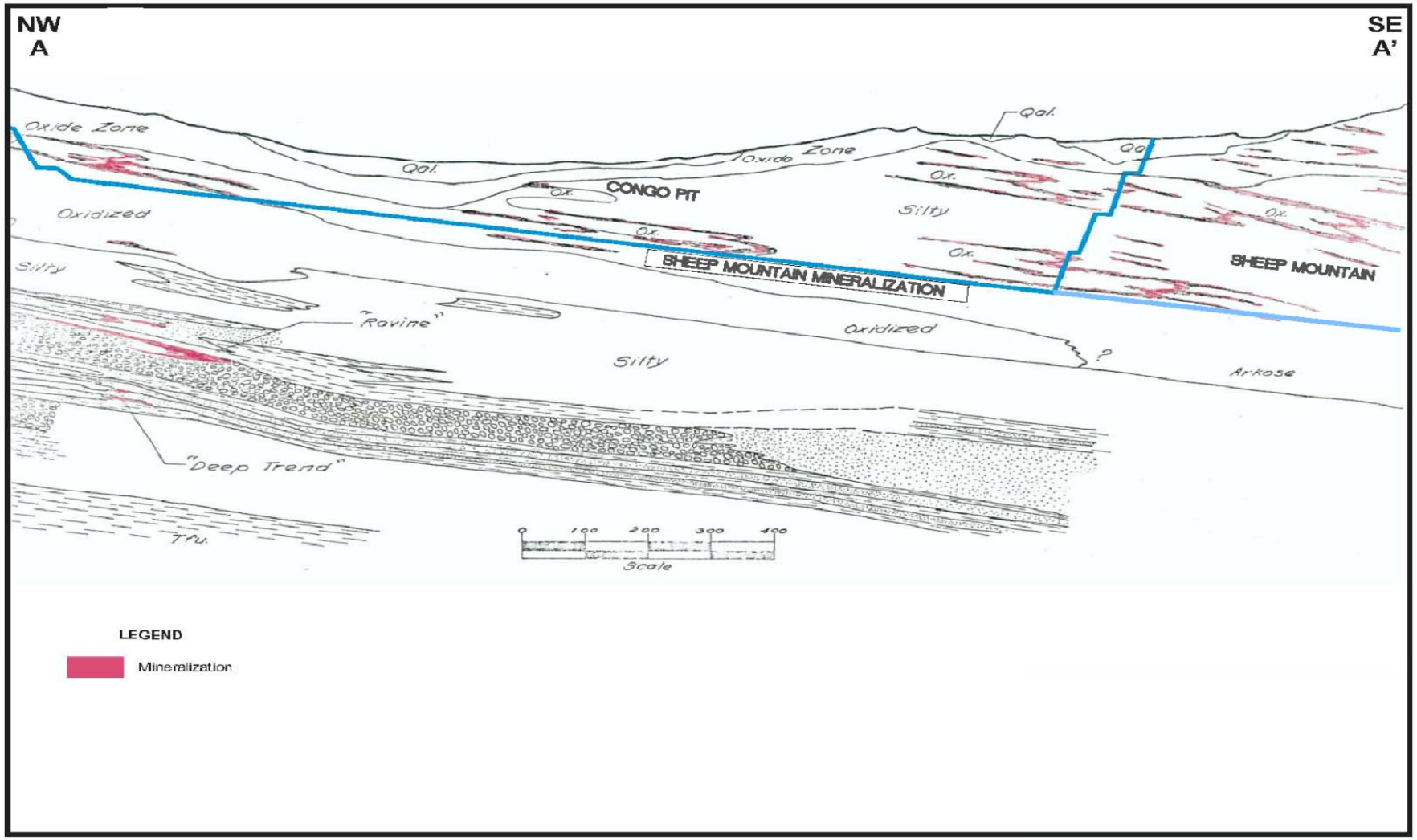


- Existing Mine Permit 381C
- Brownfield Site
- Disturbance Limits Shown
- Planned Disturbance
  - Currently disturbed or
  - In permitted mine plan
- Exception
  - Plant
  - Heap

Congo Pit

Congo Pit site


0
500
1000
YEAR 1 MAIN
YEAR 6 MAIN
YEAR 2 MAIN
YEAR 7
YEAR 3 MAIN
YEAR 8
YEAR 5
YEAR 4 MAIN
N
W
E
S
YEAR 1-4 AND 6 EAST STRIPPING
OCCURS ABOVE THE YEAR 7 AND
YEAR 8 PIT AREAS (NOT SHOWN)

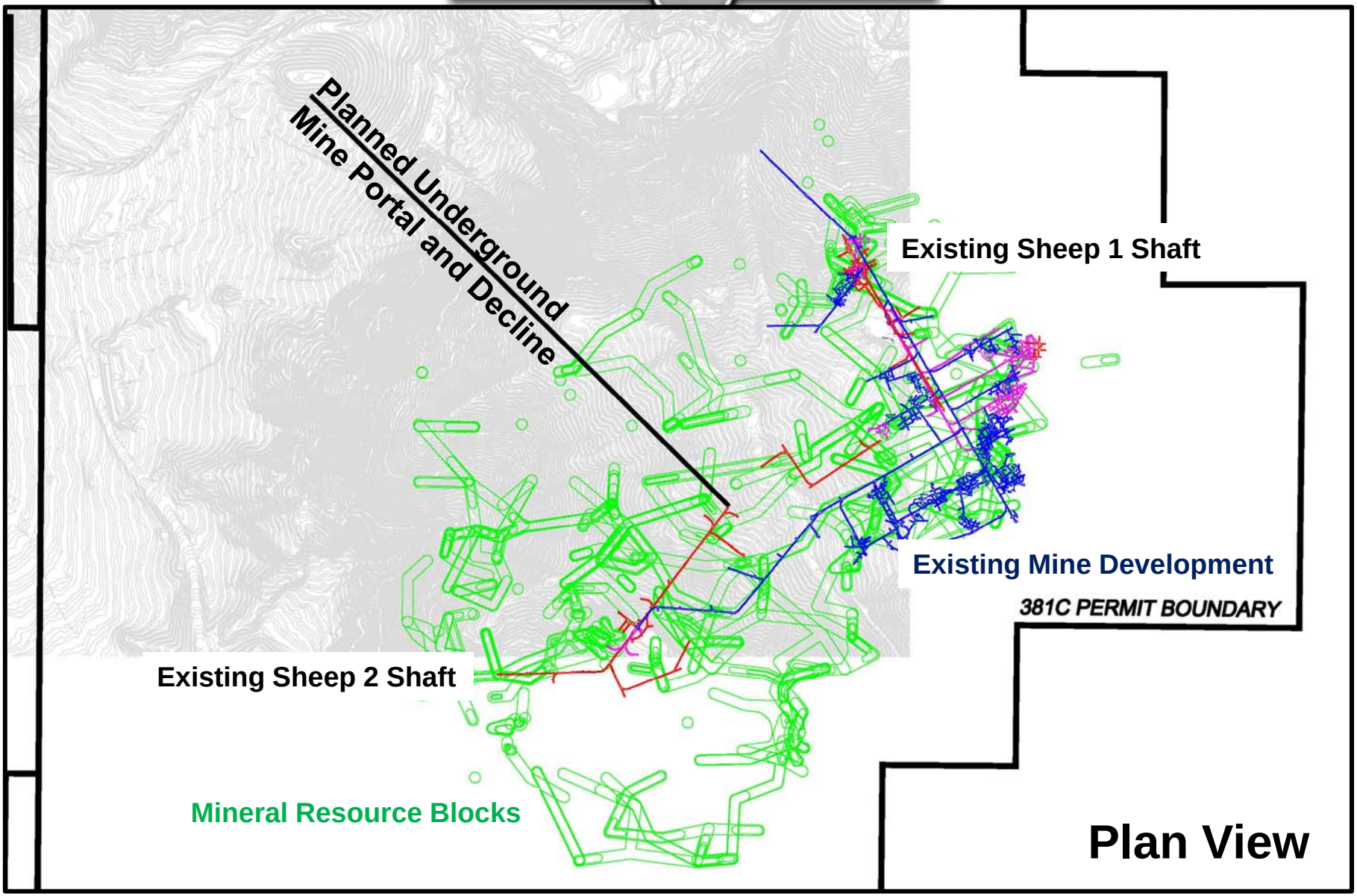

NW
A
SE
A'
Oxide Zone
Qal.
Oxide Zone
Qal.
Qal.
Ox.
CONGO PIT
Ox.
Oxidized
Silty
Ox.
Ox.
Ox.
SHEEP MOUNTAIN MINERALIZATION
SHEEP MOUNTAIN
Silty
"Ravine"
Oxidized
Silty
?
Arkose
"Deep Trend"
Tru.
0 100 200 300 400
Scale
LEGEND
Mineralization

Sheep Underground

Sheep Underground

- Sheep Underground
  - Re-opening of previously operated conventional mine
  - Allowed under Permit to Mine No. 381C.

- Mining method is a conventional method using a modified room and pillar.
  - A new double entry haulage decline
  - Conveyor haulage
  - The existing shafts will be used for ventilation and emergency access


Planned Underground Mine Portal and Decline
Existing Sheep 1 Shaft
Existing Mine Development
381C PERMIT BOUNDARY
Existing Sheep 2 Shaft
Mineral Resource Blocks
Plan View

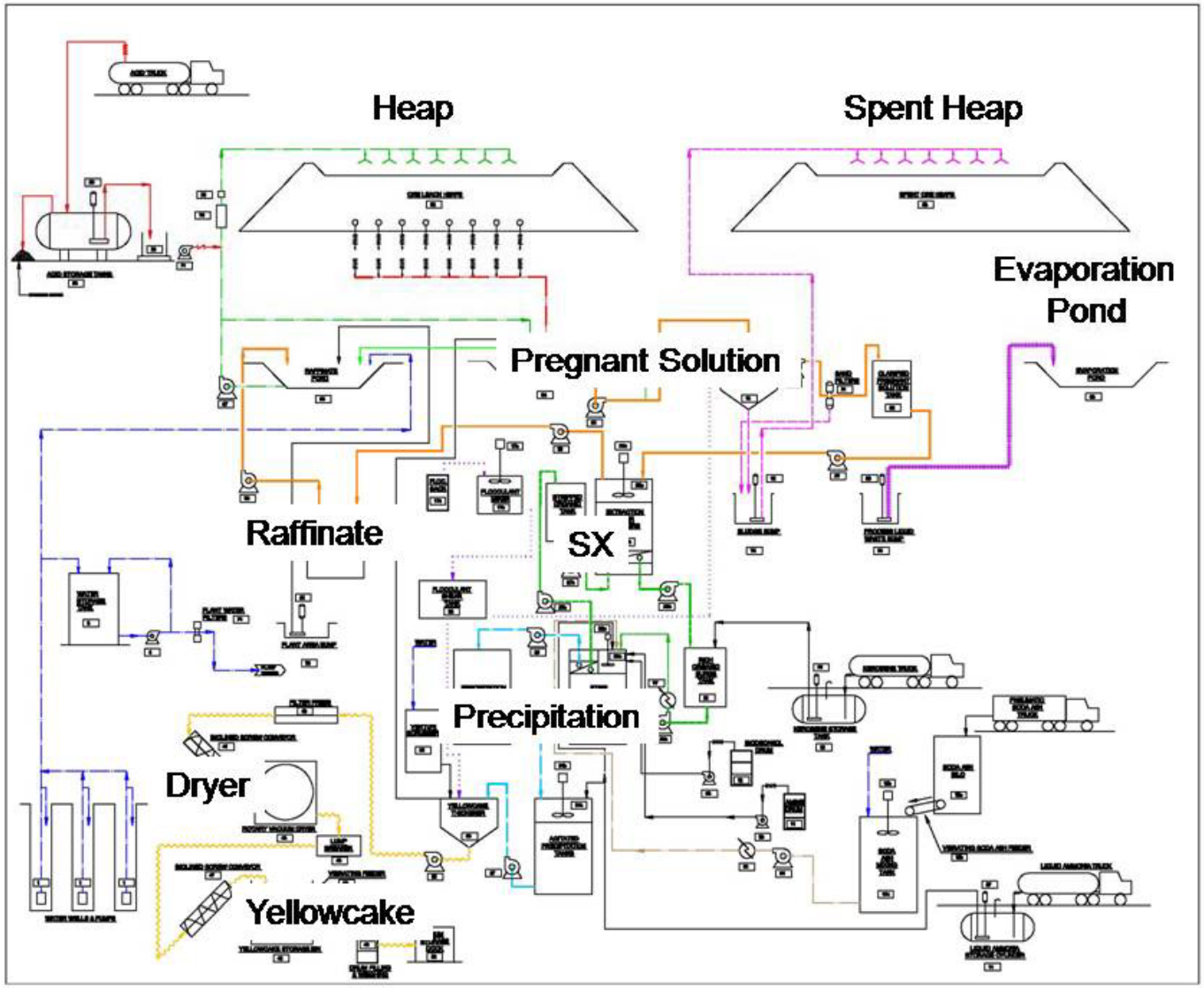
Heap Leach Recovery

Heap Leach

- Successful Mineral Processing History
- Commercial Heap Leach Operations
  - WNC and UCC
  - Analogous Ore
- Current Metallurgical Test Work Confirmation
  - Acid Leach
    - High Recovery
    - Low Acid Consumption
  - Acid locally available
- Stand Alone Facility

Sheep Mountain Heap Design Parameters

- Average Grade 0.111 %U_3O_8
- Final Tails < 0.01 %U_3O_8 (includes soluble loss)
- Overall Recovery 91% or greater
- Acid consumption <50 lbs/ton
- Conveyor loading
- Spray application

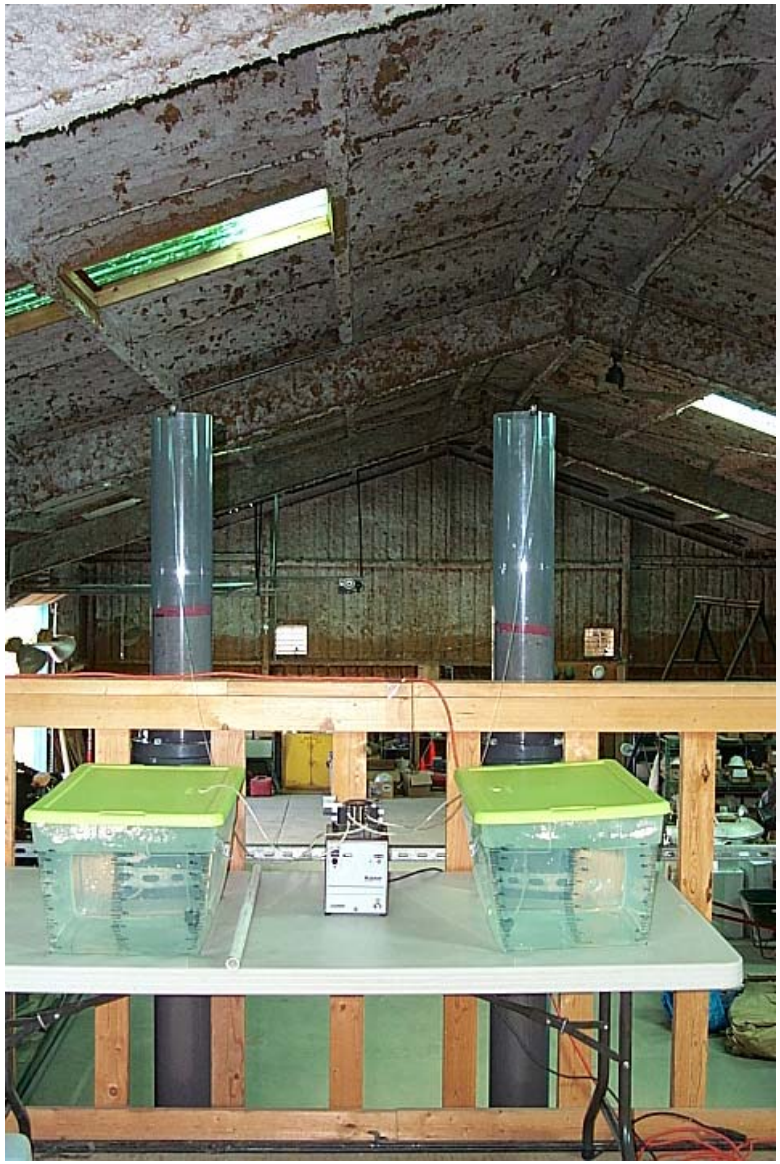

Heap
Spent Heap
Evaporation Pond
Pregnant Solution
Raffinate
SX
Precipitation
Dryer
Yellowcake

Column Leach Testing

Loaded Columns

- 15 ft Columns
- 12 ft Ore
- Six Inch Diameter

Loaded Ore



Lixiviant Addition

Columns During Leaching

Leach Solution From Column

Ion eXchange (IX) Recovery

Uranium Rich Solution

Summary of Results

- Initial Ore Head Grade: 0.058%
- Uranium mass per column: 48g
- Flow rates: 3.7 to 4.0 ml/min
- Time to solution breakthrough: 1.9 days (2760 min)
- Uranium recovery grade at breakthrough: 6400 & 6800 mg/L U
- % U recovery at 1 pore volume: 99.5% and 93.3%
- Uranium recovery grade after 1 pore volume: 201 and 180 mg/L U
- Uranium recovery grade after 2 pore volumes: 18.8 and 32.5 mg/L U

Accessory Metals

	1st Pore Volume		2nd Pore Volume	
	Column 1	Column 2	Column 1	Column 2
Al	546	442	236	248
Cu	2.53	1.45	nd	nd
Fe	1790	1470	1120	1170
Mo	1.24	0.5	nd	nd
Ni	1.84	1.28	0.15	0.22
V	0.35	0.32	nd	nd
Zn	9.74	9.31	3.32	3.66

Continued Work

- Initiate column rinse cycle
- Collect final rinse sample from each column.
- Dismantle columns and sample ore tails material.
  - Geotechnical Testing
  - Waste Characterization
  - Options for Stabilizing Spent Heap

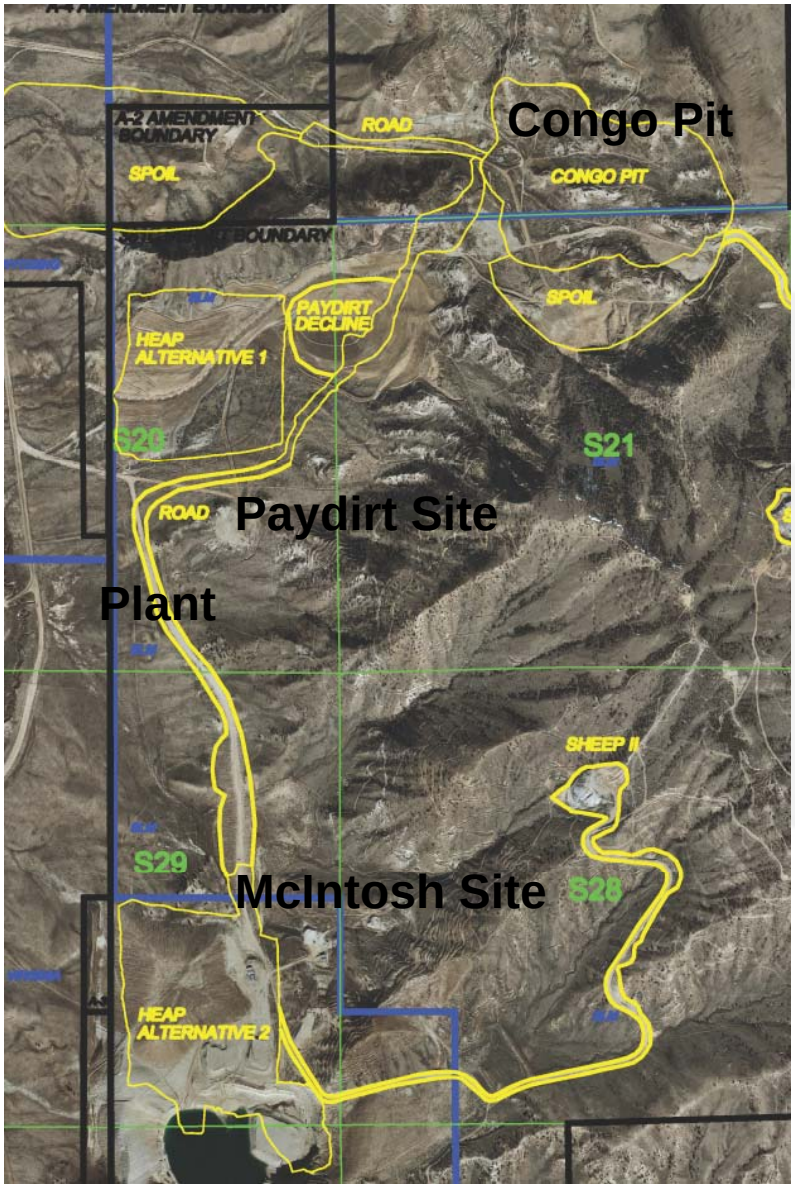
Proposed Long Term Leach Test for Spent Heap

Designation: C 1308 – 08

Standard Test Method for Accelerated Leach Test for Diffusive Releases from Solidified Waste and a Computer Program to Model Diffusive, Fractional Leaching from Cylindrical Waste Forms[1]

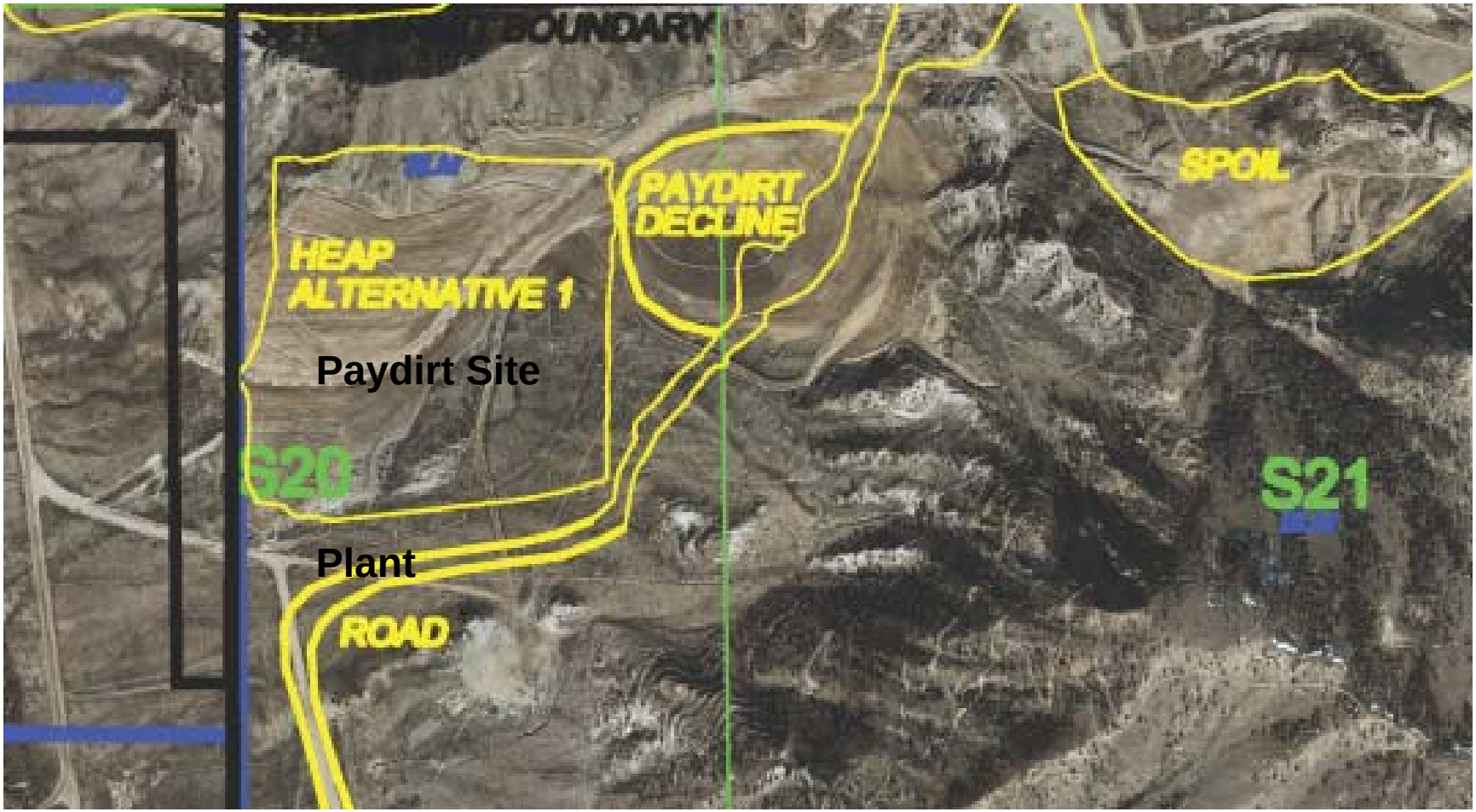
This standard is issued under the fixed designation C 1308; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

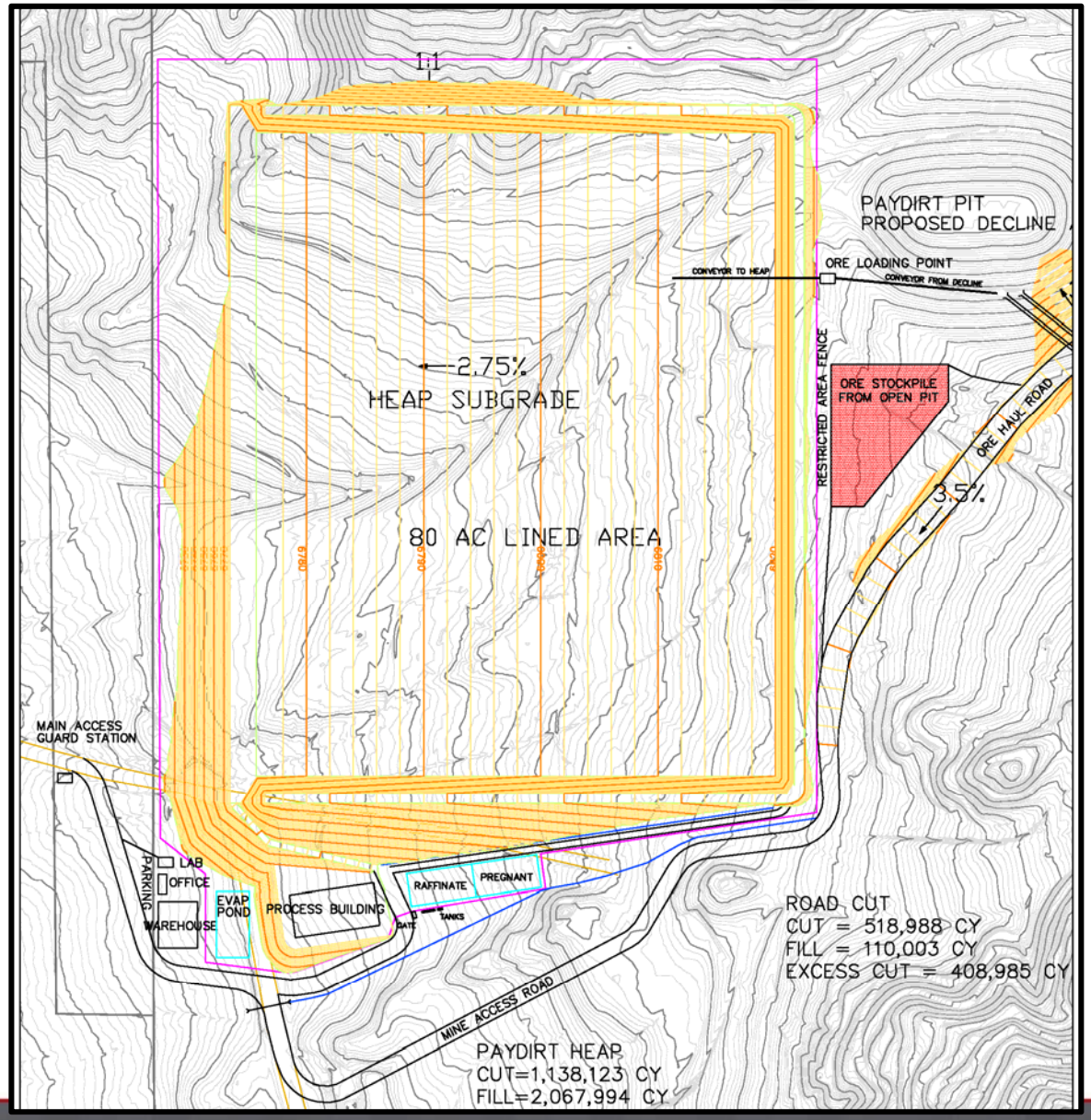
Heap Site Evaluation



- **Congo Pit Wyoming State Lease**
  - Surface and Mineral Rights WY
  - Possible Subsurface Disposal
  - Limited space
- **Paydirt Site**
  - Federal (BLM) Surface and Minerals
  - Preferred site
  - Proximity to Ore sources
  - Favorable Topo for In-Place Stabilization
- **McIntosh Site**
  - Private surface
  - Federal Minerals
  - Limited area

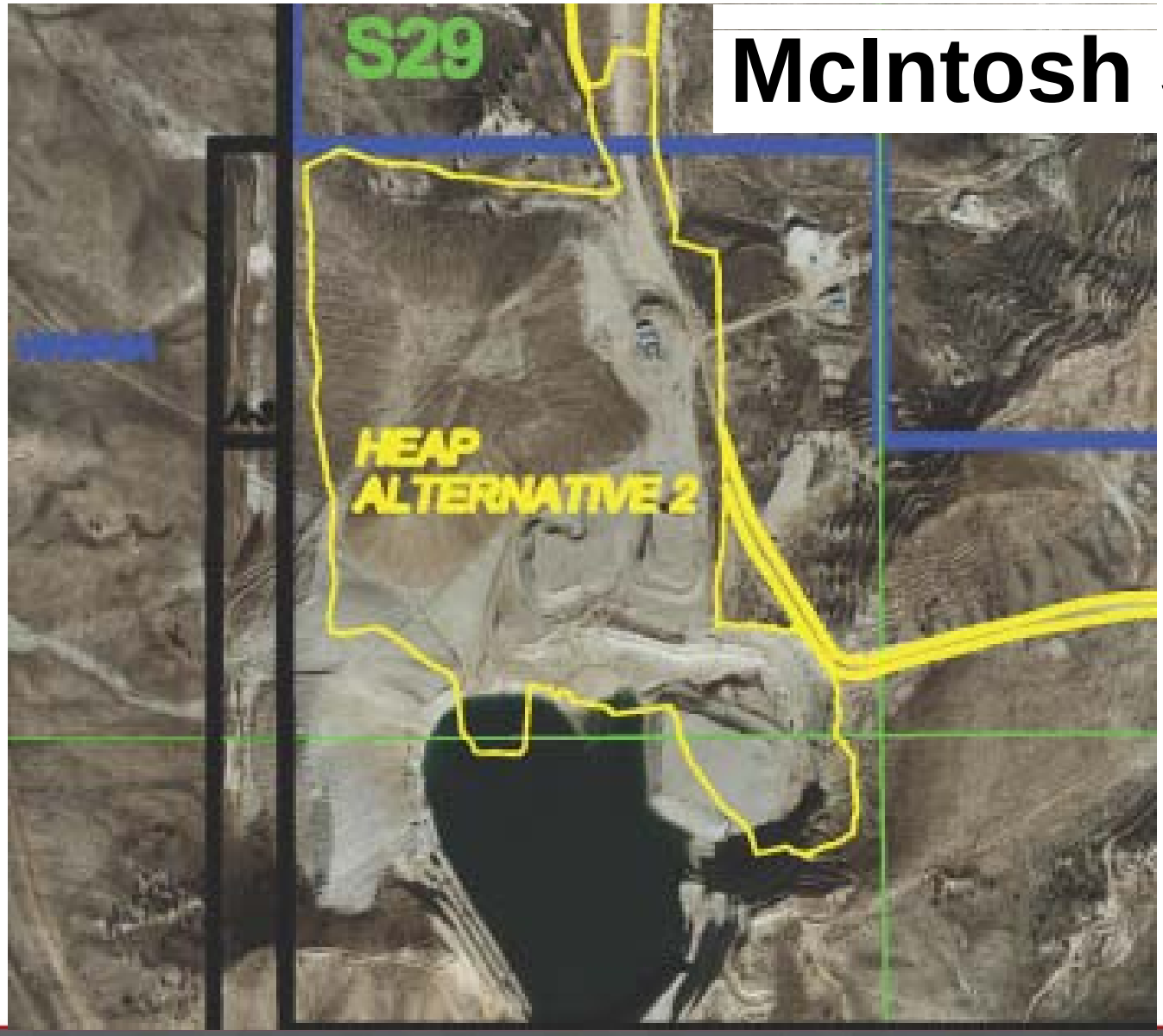
Paydirt Site

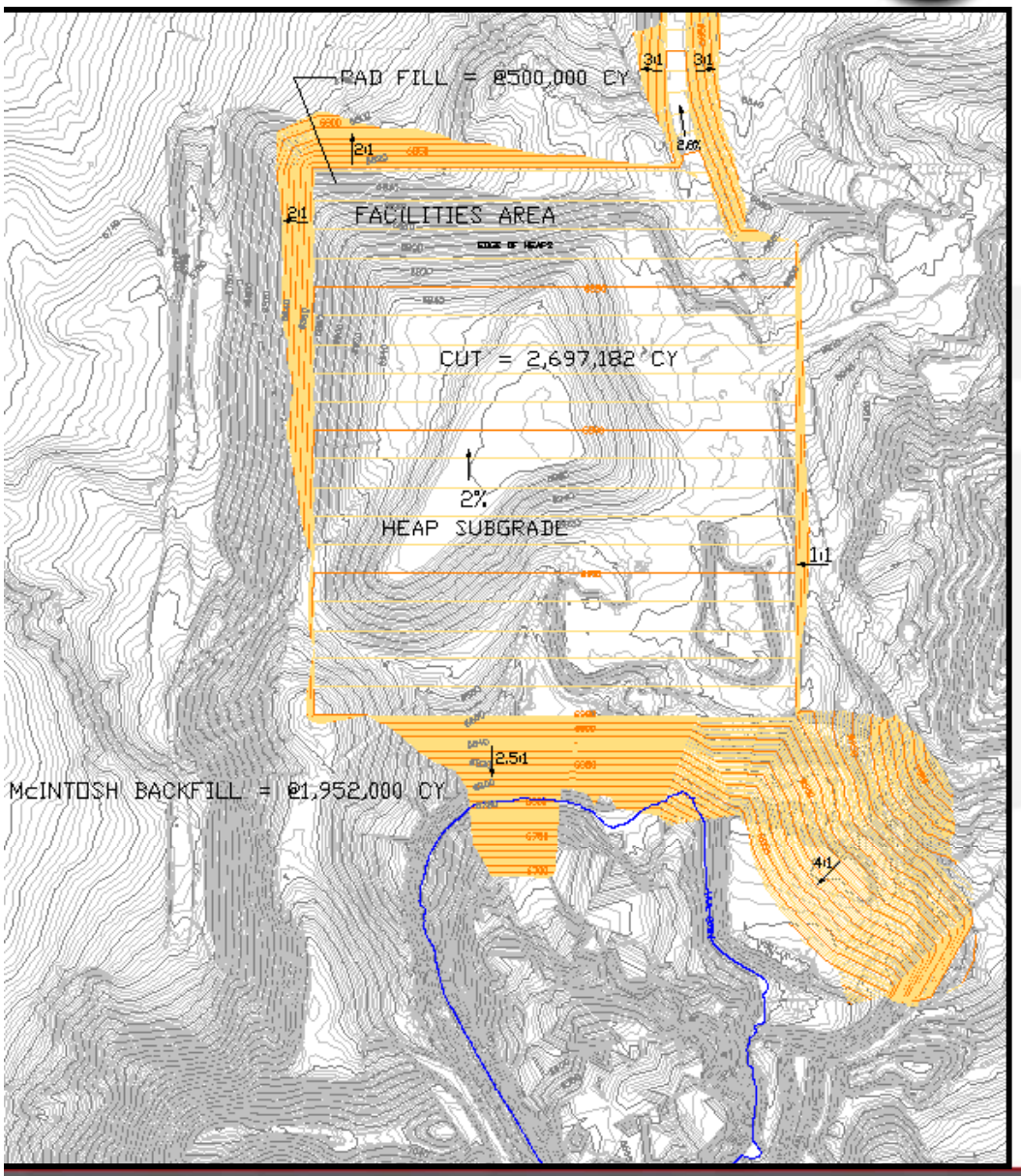




Paydirt Heap Plan View

McIntosh Site





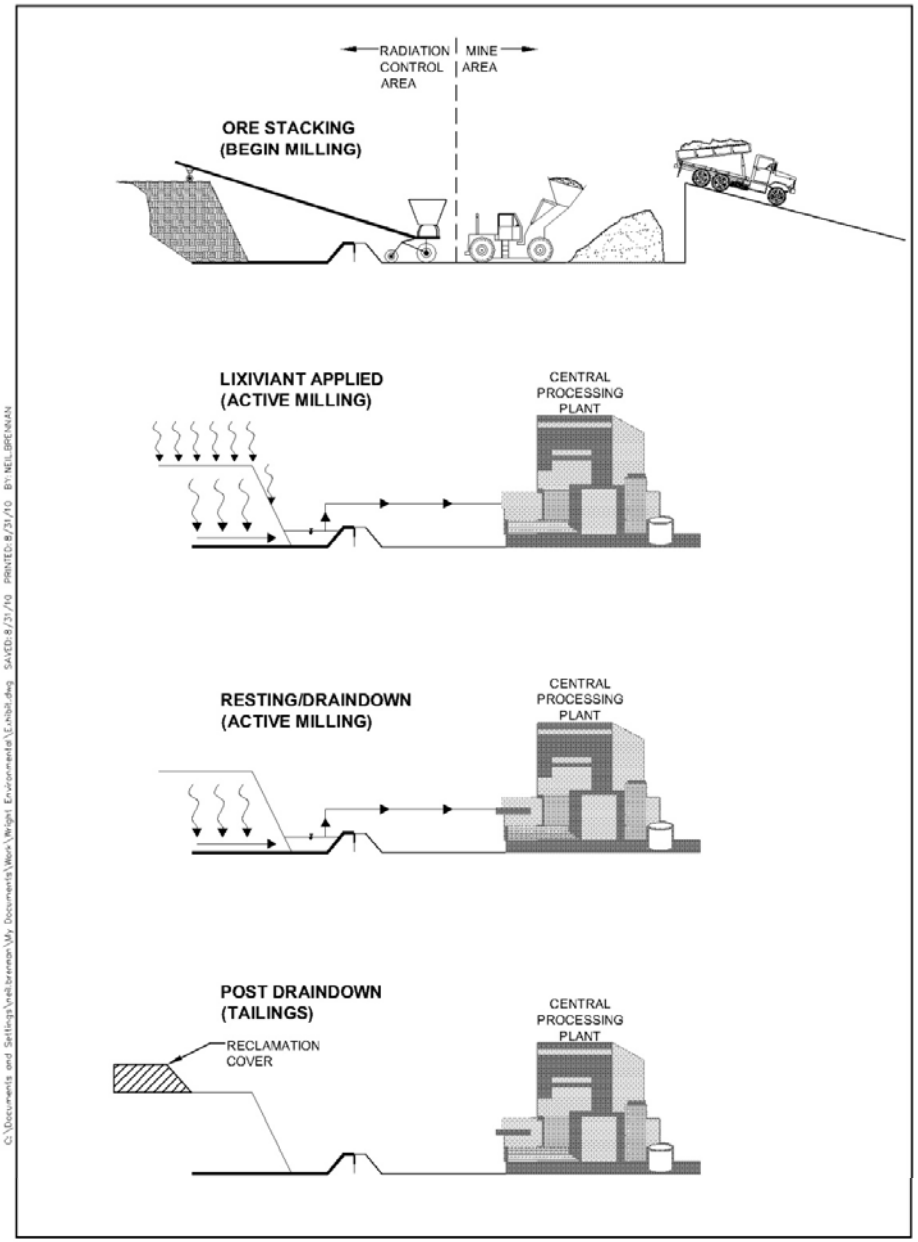
McIntosh Heap Plan View

Congo In Pit Disposal

- The volume of space within the present pit design that is above the water table yet below grade is approximately 7.1 million cubic yards.
- The spent heap material will occupy a minimum of 4 million cubic yards.
- Ten feet of cover over the pit area (104 acres) would require 1.7 million cubic yards of material.
- This leaves 1.4 million cubic yards which would equate to a buffer of less than 10 feet above the water table
- Alternatives?

Issues For Discussion

- Status of Active Heaps and 10 CFR Part 61 Subpart W
  - Active heap is active “milling”
    - Active Heap material is not 11e.(2) byproduct
  - “Resting” a heap is part of active milling
  - Have rad. monitoring and rad. protection programs to ensure public and occupational exposures remain ALARA
  - Heap becomes 11e.(2) when drain down and recovery of values is completed



Status of Active Heaps and 10 CFR Part 61, subpart W

- Active heap is active “milling”
- Heap material during active milling is not 11e.(2) byproduct material
- Have rad. monitoring and rad. protection programs to ensure public and occupational exposures remain ALARA
- “Resting” a heap is part of active milling
- Heap becomes 11e.(2) when drain down and recovery of values is completed and the heap is inactive

Issues For Discussion

- Fish Tissue Sampling from Crooks Creek
  - Reg. Guide 4.14: *Collected semi-annually from any water body that may be subject to drainage from potentially contaminated areas or tailings failure*
  - Crooks Creek sole potential receiving surface water body
  - Insufficient tissue sample mass required to achieve lower limits of detection
    - State Game and Fish Surveys: One brook trout, a few chub, suckers, long-nosed dace.
    - Need 7 Kg to achieve 5×10^{-8} µCi/kg to 1×10^{-6} µCi/kg LLD
- Planning Surface Water Invertebrate survey in lieu of Fish Tissue Sampling

Issues For Discussion

- Submit initial application exposure analyses with MILDOSE based on regional met data, using reasonable yet conservative assumptions.
- Supplement application with site-specific met data once a full 12 months of data are acquired.
  - Reg. Guide 4.14: *A complete pre-operational report with 12 consecutive months of data should be submitted prior to beginning milling operations.*
  - Not required for initial license application completeness review or initiating technical review

Issues For Discussion

- Surface water hydrology of Crooks Creek based on stream gauging during SW sampling events, no continuous stream flow measurements to date.
  - Propose to calibrate low to moderate flows based on existing culverts.