

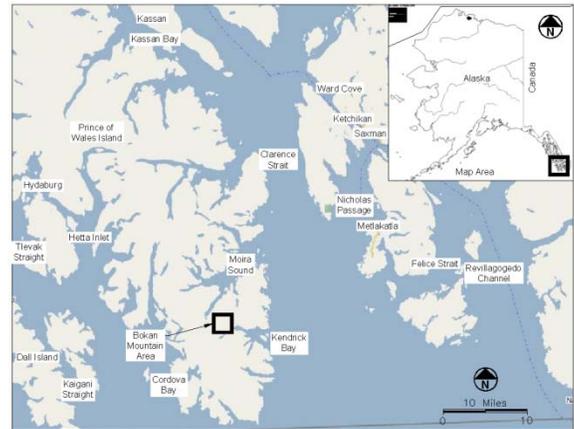
# Ross-Adams Mine Site

## Engineering Evaluation / Cost Analysis

### USDA Forest Service, Alaska Region

The Ross-Adams Mine Site (Site) is a former uranium mine located in the Tongass National Forest near the southern end of Prince of Wales Island, Alaska. The Ross-Adams Mine was mined by open pit and then later by underground operations intermittently between 1957 and 1971 by several different mining companies. The USDA Forest Service is the lead agency for the Site cleanup process, working in conjunction with Alaska Department of Environmental Conservation (ADEC), Environmental Protection Agency (EPA), Organized Village of Kasaan (OVK), Hydaburg Cooperative Association, and other stakeholders.

**Site Features:** The underground mine has three surface expressions at different mine level elevations. Mine rock, including rock developed in driving the underground tunnels, was placed near the mine openings at the three levels. Ore produced from the mine was hauled by truck to an ore staging area and barge loading docks on the north shore of the West Arm of Kendrick Bay. No ore processing occurred at the Site as all ore was shipped offsite for processing.



**Ross-Adams Site Location**

In April 2009, Newmont USA Limited and Dawn Mining Company LLC entered into an Administrative Settlement Agreement and Order on Consent (ASAOC) with the USDA Forest Service to perform an Engineering Evaluation/Cost Analysis (EE/CA) for the Site. The ASAOC is a legally binding agreement that prescribes completion of the following major tasks and deliverables:



**West Arm of Kendrick Bay and Bokan Mountain**

- **Site Planning Documents** - detailed sampling, quality assurance, and safety plans – Approved in 2009.
- **Expanded Site Investigation (ESI)** - characterizes the physical, chemical and radiological conditions – Conducted in 2009.
- **Site Characterization Report (SCR)** - presents the results and conclusions of the ESI – Approved in 2010.
- **Engineering Evaluation/Cost Analysis (EE/CA)** - evaluates removal action (cleanup) alternatives and recommends a preferred action to reduce potential risks resulting from historic mining activities. Human health and ecological risk assessments were conducted as part of the EE/CA to guide evaluation of removal action alternatives.

Principal surface features associated with former mine operations include:

- 900-Foot Level - open pit, mine portal and air vent shaft, north and south mine rock piles (MRP), and mine rock embankments along the access road to the 700-Foot Level;
- 700-Foot Level - mine portal and mine rock pile;
- 300-Foot Level - mine portal with mine water drainage and mine rock pile;
- Former Ore Staging Area (OSA) – at northern shore of the West Arm of Kendrick Bay, with residual ore materials;
- Former Ore Loading Docks – Two remnant rock ramps extend from the OSA area into the West Arm of Kendrick Bay and the remnants of a third and older ramp are located west of the existing floating dock; and,
- Mine and Haul Roads (including I&L spur road) - primary roads constructed for exploration and mine access which served as haul roads connecting the 700-Foot, 900-Foot and 300-Foot Levels to the OSA and loading docks/ramps.

**Removal Action Objectives:** The EE/CA defines removal action objectives for evaluating removal action alternatives and Site cleanup based on the results of the human health and ecological risk assessments for existing Site conditions and land-use management plans for the Tongass National Forest. The removal action objectives consist of:

- Reduce human health risk from potential exposure to direct gamma radiation and inhalation of radon from mine rock and mine openings;
- Reduce risk for recreational users from exposure due to potential ingestion of soil and surface water;
- Reduce or eliminate safety hazards related to the mine openings and access to the underground mine workings;
- Reduce risk or eliminate exposure pathways for terrestrial plants, terrestrial invertebrates, terrestrial wildlife from exposure to certain metals and radionuclides;
- Reduce risk or eliminate exposure pathways for riparian animals from exposure to radium in surface water;
- Minimize disturbance to existing undisturbed areas;
- Minimize reliance on long-term active maintenance.

**Overview of Removal Action Alternatives:** Five removal action alternatives mine rock and four removal action alternatives for mine portals are evaluated in the EE/CA to provide flexibility in decision making. All alternatives were evaluated using three main criteria: effectiveness, implementability, and cost.



**900-Foot Level Mine Rock Pile**

The mine rock removal action alternatives are:

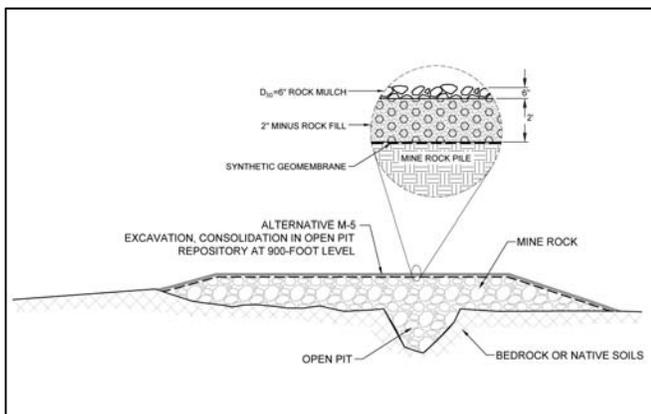
- Alternative M-1 – No Action
- Alternative M-2 – In-Place Stabilization with Stormwater and Institutional Controls
- Alternative M-3 – In-Place Covering of Mine Rock Piles
- Alternative M-4 – Excavation, Consolidation and Cover at Mine Affected Areas
- Alternative M-5 – Excavation, Consolidation and Cover at Open Pit Repository



**300-Foot Level Portal**

The removal action alternatives for mine portals are:

- Alternative P-1 – No Action
- Alternative P-2 – Close Upper Mine Openings with 300-Foot Level Portal Gate
- Alternative P-3 – Close Upper Mine Openings with 300-Foot Level Portal Rock Backfill Closure
- Alternative P-4 – Close Upper Mine Openings and 300-Foot Level Portal Concrete Bulkhead



**Recommended Removal Action:** The EE/CA recommends the following alternatives as the preferred removal action:

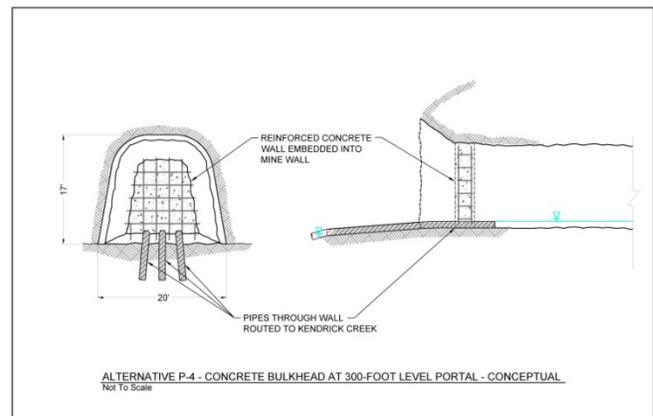
- Alternative M-5 – Excavation, Consolidation and Cover at Open Pit Repository
- Alternative P-4 – Close Upper Mine Openings and 300-Foot Level Portal Concrete Bulkhead

Mine Rock Alternative M-5 includes the following components:

- Removal of ore rock within the intertidal zone associated with former loading ramps and ore loading operations and consolidation at the Open Pit Repository;
- Removal of the miscellaneous debris and transport for off-site recycling and disposal, except for drill core that would be consolidated at the Open Pit Repository;
- Excavating, transporting and consolidating the mine-affected material from the OSA, and the mine rock piles from the 300-Foot Level; 700-Foot Level, and 900-Foot Level (North and South piles) at the Open Pit Repository;
- Excavating and consolidating the I&L Spur road materials in the Open Pit and closing the road;
- Removing and consolidating the identified mine road (between the 700-Foot and 900-Foot Levels) embankments in the Open Pit and closing the mine road;
- Excavating the mine rock from the identified segments of the haul road and consolidating the material in the Open Pit;
- Placing a 2-foot thick cover over a synthetic geomembrane on the mine rock materials consolidated at the Open Pit Repository from the on-site borrow source and constructing stormwater controls to protect the covered areas; and,
- Implementing institutional controls, access controls, and/or land use restrictions to protect the integrity of the removal action.

Portal Alternative P-4 consists of the following components:

- Closure of the upper mine openings consisting of the 900-Foot Level portal, Air Vent Shaft and 700-Foot Level portal;
- Constructing a concrete bulkhead at the 300-Foot Level portal, with a water collection and piping system to convey the drainage from the portal directly to Kendrick Creek; and
- Implementing institutional controls, access controls, and/or land use restrictions to protect the integrity of the portal closures.



The recommended removal action is:

- Protective of human health and the environment;
- Achieves the removal action objectives and applicable or relevant and appropriate requirements;
- Returns all mine rock to the naturally mineralized area at the Open Pit;
- Provides permanent containment of mine materials;
- Returns the area below the 900-Foot Level to pre-mining conditions;
- Reduces inflow of water from the Open Pit and 900-Foot Level portal and vent shaft into the underground mine; and,
- Reduces radon emanation and exposure to water drainage from the 300-Foot Level portal.

**How to Participate:** Review project information and documents available on the following website:

<http://Ross-Adams-EECA.com>

**Attend:** The public open-house at the Klawock School on April 28, 2015 from 7:00-9:00 PM and the presentation at the Prince of Wales Island-Wide Mining Symposium, sponsored by OVK, in Klawock on April 29, 2015.

**Contact and provide comments to:**

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**Public comment period:** May 1 – May 30, 2015