Landsburg Mine Site, Ravensdale

Public Comment Period
For Proposed Cleanup

October 2013

DEPARTMENT OF ECOLOGY
State of Washington

Agenda

6:30 – 7:00 pm: Open House

7:00 – 7:30 pm: Presentation

Jerome Cruz (Department of Ecology)
Douglas Morell (Golder Associates)

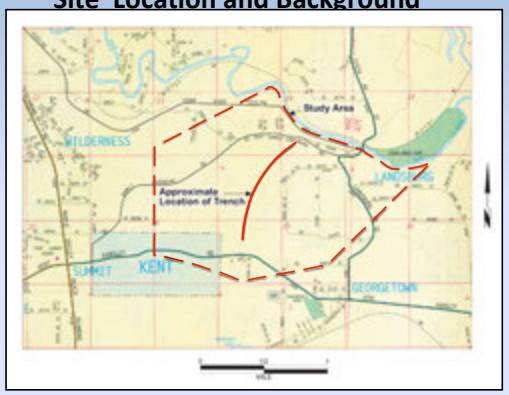
7:30 – 8:30 pm: Open Forum (Questions and Answers)

Landsburg Mine site

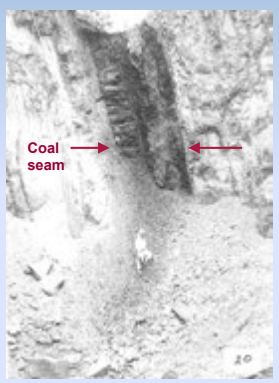
- Draft Cleanup Action Plan completed.
- Groundwater coming from mine remains clean.
- No change for the last 20 years of monitoring and investigation.

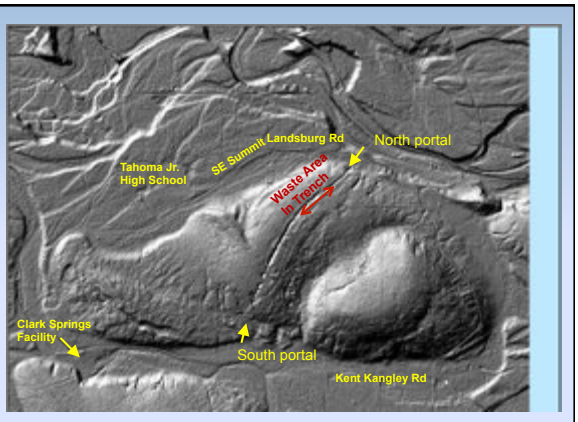
Site Background and History

Site Location and Background



Rogers Coal Seam





Timeline of Events

1960
- 1959 to 1975 - Underground Mine operations

1970
- 1969 to 1978 - Waste disposal over northern portion of trench

1980
- Disposal of land clearing debris in the 80s

1990
- 1990 to 1991 - Private wells and portal water tested
- 1991 - Site is listed; Expedited drum removal

2000
- 1994 to 1996 - Remedial Investigation/Feasibility Study; first Draft Cleanup Action Plan
- Interim groundwater monitoring
- Two deep wells

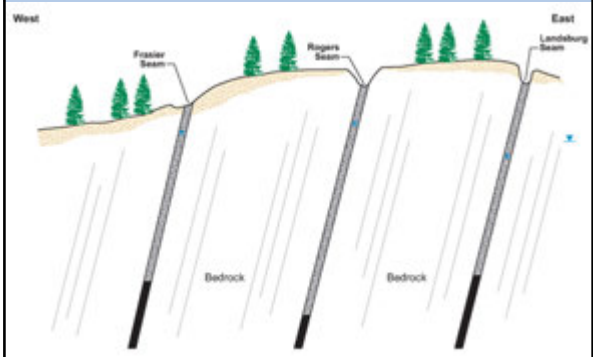
2010
- Infrastructure installed for Contingent Groundwater Treatment System (north portal)

Landsburg Mine Original Potentially Liable Persons (PLPs)

- Browning-Ferris Industries/Allied Waste
- BNSF Railway Company
- PACCAR Inc
- Plum Creek Timberlands, L.P.
- TOC Holdings Co.
- Palmer Coking Coal Company, LLP

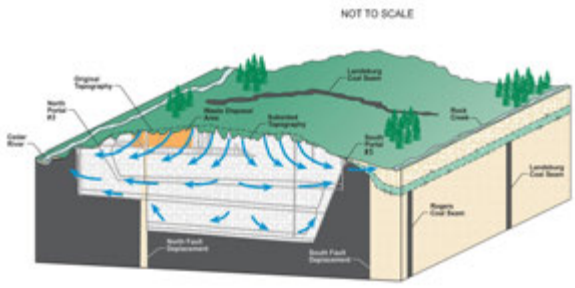
Aerial view of site

Cross Section of Mines



(From Golder Associates, 2004)

Groundwater Movement in Rogers Coal Mine



(From Golder Associates, 2004)

Key Investigative Results

- Wastes were disposed in the northern trench area.
- 20 years of groundwater monitoring.
- No groundwater contamination coming out of the mine.
- No threat to human health and the environment outside of northern trench area.

Ready for cleanup

- Hydrogeology known
- Cleanup Action Plan ready

Key Cleanup Concepts

- Precautionary assumption that wastes could migrate out via groundwater.
- Groundwater travels predominantly toward the former mine portals.
- Waste removal not practical.

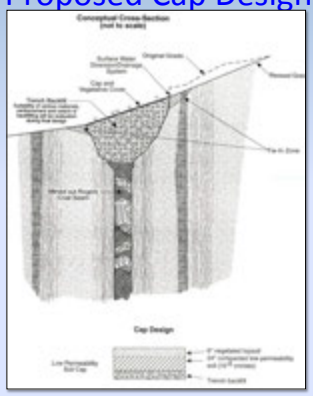
Proposed Cleanup Action

- Cap and diversion trenches
- Monitoring wells
- Institutional controls
- Contingency plans and infrastructure

Proposed Remediation System

- Low permeability cover cap over waste
- Surface water diversion around mine trenches

Proposed Cap Design

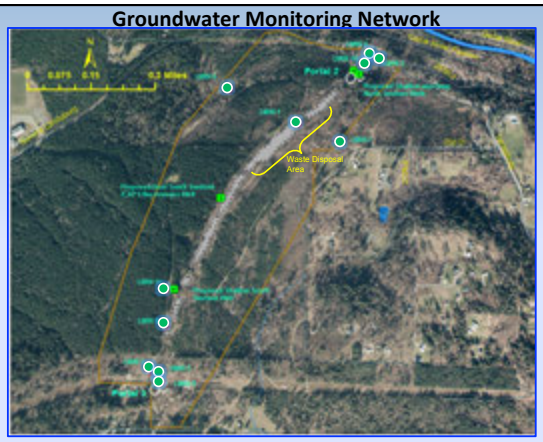


Proposed Cap & Drainage Diversion

Proposed Remediation System (continued)

- Additional early warning monitoring wells
- Groundwater monitoring indefinitely
- Funding indefinitely by potentially liable persons.

Groundwater Monitoring Network



Groundwater monitoring schedule

Period	When	What
CONSTRUCTION	Every two weeks	General parameters (pH, turbidity, dissolved oxygen, etc.
	Every month	General & Volatile organics
POST-CONSTRUCTION		
Year 1	Every three months	Full suite (1st round)
		Partial suite (rest of year)
Years 2 to 5	Twice a year	Full (1st round)
		Partial (rest of year)
Years 6 to 10	Once a year	Full suite
Years 11 and beyond	Once every 2 ½ years	Partial suite (North)
	Once every 5 years	Full suite (North) Partial suite (South)
	Once every 10 years	Full suite (South)

Proposed Remediation System (continued)

- Institutional controls on groundwater use at property
- Institutional controls on mine site use and capped areas

Proposed Remediation System (continued)

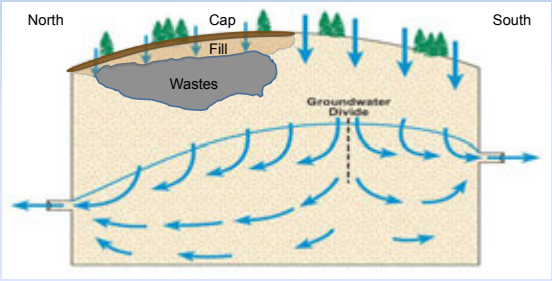
- Contingent groundwater treatment system
- Contingency plans in case of detection

Infrastructure for Contingent Groundwater Treatment Systems

Benefits of Proposed Remedy

- Wastes isolated.
- Less water entering the mine.
- Less outflow from the mine.
- Groundwater divide will be maintained.
- Contingency plans.

Benefits of Remedy



Not Drawn to Scale

SUMMARY

- Studies are done.
- Confidence in results.
- No detections in 20 years.
- Cleanup actions will work.

It is time to get the cleanup done.

Question and Answer

Groundwater Monitoring Network