300 Area End State Workshop, May 19, 2005

Groundwater Remediation

Questions:

Groundwater Remediation Alternatives and Technologies

- Are the alternatives we are considering for the groundwater feasibility study appropriate?
- Are you aware of any other potential groundwater technologies which should be considered?
- Are there other considerations that should be evaluated?

Groundwater Remedy Selection Considerations

- Given the possible types of surface uses and the potential groundwater remediation alternatives, what considerations are important for groundwater remedy selection? (For example, what is an acceptable period of time to achieve groundwater goals, and under what surface end states would it make sense to continue with monitored natural attenuation or be necessary to pursue alternative approaches?)

Workshop input (Brainstorming Results):

Groundwater Remediation Alternatives and Technologies

- Install a grout curtain up gradient of the uranium plume. Allow river/groundwater interaction to clean out the uranium in groundwater
- Look at other sites with uranium contamination (for example Fernald) – what remedy did they choose and is it applicable (someone who had worked on the groundwater cleanup at Fernald was at the meeting and gave a brief description of the groundwater remediation approach used)
- In situ vitrification
- Don't allow development to preclude remedies that might be applied in the future.
- Alter the chemistry of the groundwater (by modifying the pH or redox potential) moving into the 300 Area so that uranium stays immobile.
- A golf course or a water park could be part of the remedy to drive uranium out of the groundwater for treatment.
- Flush the contaminant from the aquifer and capture it in pumping wells along the shoreline - willing to accept a short tem pulse to the river from flushing the deep vadose zone and aquifer

Groundwater Remedy Selection Considerations

- Uranium has a very long half life.
- Need to determine the effects of uranium on aquatic organisms
- Can we protect aquatic organisms by denying them access to uranium at the shoreline (with riprap or other access barrier)?
- Need to look at the total load of contaminants in the river effecting aquatic organisms – not just the 300 Area contributions
- Need to think long term – the land use will change with time.
- Natural attenuation did not reduce uranium concentrations to the drinking water standard in 10 years. Some questions need to be answered about this approach.
    - How long will it take?

    - So how long do institutional controls need to work to protect people from using water that is above the standard?
    - How long can we wait?
- Need a phased approach. First characterize; then identify remedies.
- Is technology the problem or is implementation the problem?
- Characterization of groundwater contamination should be done in parallel with facility D&D.
- D&D and groundwater RI/FS schedules are not well integrated.
- Life-cycle cost estimates must include the costs of surveillance and maintenance and institutional controls.
- Balance the cost of long term institutional controls vs dealing with the contaminant once and for all by digging it up and moving it to ERDF
- Use combination of alternatives
- Integrate soil and groundwater decisions
- Consider tribal cleanup standards and consumption by Native Americans
- Institute controls to address sensitive populations (children, pregnant women)
- If there is a change in the planned land use after cleanup – then natural attenuation is not sufficient.
- Recognize other contaminants – not just uranium.