



Protecting
The Columbia
River

Hanford Site

Integration Project Expert Panel

Outbrief Presentation 8th Panel Meeting October 27, 2000

**Dr. Edgar Berkey
IPEP Chairman**



Theme of the Meeting - The Columbia River

- ❖ Theme was inspired by the first outcome defined for the accelerated cleanup program
“Restore the River Corridor”
- ❖ IPEP wanted to explore:
 - ◆ scientific knowledge base available to support this outcome. . .
 - ◆ also, the gaps in knowledge . . .
 - ◆ and the linkages to the Integration Project, especially at the interfaces
- ❖ We focused on river ecology and water quality
- ❖ Thank you for preparing and providing so much interesting material . . . we know there is more and we will be coming back to it!

An Opening Observation . . .

- ❖ The official name of the Project is . . .
“Groundwater/Vadose Zone Integration Project”
- ❖ We have noticed that most of you use the phrase “GW/VZ” to discuss the Project . . .
- ❖ While we use the “IP” . . .
- ❖ The River is not explicitly part of the name, although “Protecting the Columbia River” is in the logo
- ❖ This is just an Observation, not a Conclusion or Recommendation . . .
- ❖ But vision, emphasis and repetition can drive action, and
- ❖ IPEP still believes strongly in “Integration” as a needed central concept

Hanford Site Outcomes - 2012

- ❖ IPEP applauds the creative thinking and reasonable results that are coming out of the accelerated site cleanup effort
- ❖ We are also aware of the important questions and concerns that still need to be addressed
- ❖ “The Devil is in the Details” . . . but the results to date are very promising. The key is establishing and maintaining credibility
- ❖ This is clearly a time for transparency in assumptions and decision-making . . . And to emphasize and explain the benefits to stakeholders of the trade-offs being made
- ❖ We are encouraged by the progress being made



Progress on IP Topics

❖ Soil Inventory and Uncertainty Model

- ◆ Essential Tool for SAC
- ◆ Pleased that progress is evident
- ◆ We will explore Inventory/VZ interface further in next IPEP meeting

❖ Tank Farm Vadose Zone Project

- ◆ Thank you for the slant hole, but all objectives that we recommended for this hole were not met. (e.g. full VZ penetration, neutron log, etc.)
- ◆ We hope Final Report will contain an interpretation of the data that meets IP needs
- ◆ We look forward to reviewing the results.

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Closeout Report - 8th Meeting River Ecology: What We Know, What We Need to Know

October 27, 2000

James R. Karr



Public Safety and Resource Protection Program

- ❖ Six presentations covering 2 of 6 focus areas
 - ◆ Introduction
 - ◆ Routine Monitoring
 - ◆ Biological Research
 - Historic
 - Recent
 - ◆ Challenges/Long-term Needs

- ❖ Stepping back now -- overarching issues across these presentations

- ❖ Detailed comments later



What We Saw (I)

- ❖ Early recognition of importance of ecological monitoring and research
- ❖ Began with narrow conception
 - ◆ Tracking radionuclides in surface (river) water
 - ◆ Evaluating acute effects on river organisms
- ❖ Insightful expansion of focus over time demonstrates that bright, motivated, dedicated scientists involved across the decades



We We Saw (II)

❖ Expansions

- ◆ Aquatic and terrestrial
- ◆ Selected vertebrates to plants and beyond
- ◆ Radionuclides to metals and beyond
- ◆ Acute and chronic effects
- ◆ Surface and groundwater to river (terrestrial)
- ◆ Pharmacokinetics to ecosystems
- ◆ Space-time (patterns) to cause-effect (processes)
- ◆ Individual to ecological to cultural well-being
- ◆ Incorporation of risk framework

❖ Now time to define the core activities important to IP

What We Didn't See

- ❖ These are requirements for success!
 - ◆ Inventory of data sets and research outputs
 - ◆ Characterization of relevance to IP drivers and key needs
 - ◆ Systematic definition of key indicators relevant to those needs
 - ◆ Identification of information needs; steps to fill those needs
 - ◆ Integration of biological results to strengthen SAC
 - e.g., scale appropriate to systems and models of systems
(SAC → Ecology; Ecology → SAC)
 - ◆ Organization of this information to facilitate communication with IP staff and managers, IPEP, stakeholders, tribal nations, etc.
 - ◆ Research and monitoring to evaluate effectiveness of cleanup/restoration



Recommendations

- ❖ Proactive efforts by management and ecologists to yield integration at ecological levels
- ❖ Do the “inventory” and “characterization” to define indicators, research needs, and monitoring strategies
- ❖ Focus on evaluation and validation with biological endpoints
- ❖ Don't make this biological/ecological dimension a sequential step -- Make it integral to project advances now. River first, terrestrial ASAP.
- ❖ Use understanding of ecological context and consequence to improve communication with interested constituencies

Benefits

- ❖ Better conceptual foundations for SAC models

- ❖ Avoid wasting resources (time and money) on unneeded, ineffective, or damaging cleanup activity

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**Closeout Report - 8th Meeting
Water Quality: Contaminant Inputs and
Monitoring Strategy**

October 27, 2000

R. Bassett



River Monitoring Program

❖ Observations

- ◆ Well organized program; motivated, highly focused professionals
- ◆ Technically strong group, publishing in peer reviewed journals, public and conference presentations
- ◆ Initiative to involve S&T, national labs through workshops, use innovative technology

❖ Recommendations

- ◆ Need increased visibility and more obvious connections with the Integration Project -- IP language, summary reports and progress statements should always include the river as part of the IP



Re-evaluation of Monitoring Role

❖ Observation

- ◆ Long history of data collection, geographically diverse, for both rad & chem elements
- ◆ Data serve functions of public assurance of compliance and needs of special projects
- ◆ Have had recent success in defining flow and sampling strategies for the river/groundwater interface
- ◆ Recent budget cuts (1995) have impacted scope

❖ Recommendations

- ◆ Conduct an internally lead program review, with outside expert support, to examine priorities, regulatory requirements and legacy sampling in light of changing needs -- Optimize for integration efforts
- ◆ We support:
 - Establishing a comprehensive river baseline for SAC required dissolved solute, suspended materials, and sediment concentrations
 - Developing environmental signatures for distinguishing Hanford contaminant sources from non-Hanford sources
 - Conducting river bathymetry



Analytical and Resource Issues

❖ Observation

- ◆ River monitoring has a key role in measuring the success of site cleanup
- ◆ Monitoring must be sharply focused, and compatible with respect to key elements rad and chem on site and in-river

❖ Recommendations

- ◆ River monitoring group should formulate recommendations about sampling analytes with long histories, in light of changing site operations (e.g., ^{129}I) but still maintain public confidence
- ◆ Confirm that analytical methods and detection limits meet SAC needs for both the site and the river, especially at the interface (e.g., ^{99}Tc , Cr, and solvents)



SAC Modeling Impacts

❖ Observations

- ◆ Significant cooperation between rad and chem monitoring and biological studies
- ◆ Already defining hydrology of the GW/river interface
- ◆ Well established distribution and monitoring locations
- ◆ Not clear that river monitoring is at the spatial scale to interface with SAC; both are constrained by other considerations

❖ Recommendation

- ◆ If SAC is to be successful, contribution from the river monitoring must provide data useful for verification and calibration

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Closeout Report - 8th Meeting Groundwater Remediation and the River Corridor

October 27, 2000

Dr. Michael Kavanaugh

Groundwater Remediation - Update

❖ H, D and K Area Chromium Cleanups

- ◆ Uncertainties in source mass of chromium and variability in groundwater monitoring results for Pump & Treat raise doubts about prediction of compliance within 2-10 years
- ◆ Recommend reporting reduction in chromium flux to river in addition to time series data from compliance wells
- ◆ ISRM is a critical technology to meeting targets established in new accelerated cleanup strategy
- ◆ Recommend preparing an interim performance evaluation report on ISRM to address reliability and cost concerns. IPEP supports continued scientific studies and optimization efforts to improve this innovative technology



Groundwater Remediation Along River Corridor - Update (continued)

❖ N Area Strontium 90 Cleanup

- ◆ Ineffectiveness of pump and treat to remove significant Sr⁹⁰ has been clearly demonstrated (0.8 curies in 490 million liters of extracted water over 5 years)
- ◆ Flux of Sr⁹⁰ into Columbia River does not appear to pose any unacceptable ecological or human health risks
- ◆ IPEP supports evaluation of new technologies for Sr⁹⁰ plume; we recommend consideration of natural attenuation option as well
- ◆ Potential savings of over \$800,000 per year

Groundwater Remediation Along River Corridor - Tritium Investigation

Near 618-11 Burial Ground

- ❖ IPEP commends IP for rapid response and innovative investigative approach to this problem
- ❖ We support proposed path forward of defining extent of local “hot spot” and assessing need for hydraulic containment, if the risks are shown to be excessive

Groundwater Remediation - Long Term Institutional Management

- ❖ IPEP is encouraged to see that the IP is beginning to explore implications on remediation and vadose zone decisions of recent NRC Study on long term stewardship -- We agree that barriers are likely to fail eventually
- ❖ IP must consider long term Institutional management issues in River Corridor after removal of reactors and waste sites, since some contamination will remain in place
- ❖ We are concerned that groundwater remediation may require more long term institutional management than is currently being considered (e.g. chromium plumes, carbon tet plume)
- ❖ Recommend preparation of a comprehensive report on effectiveness of groundwater remediation systems, verifying to stakeholders the effectiveness of hydraulic control, the impact of decay on risk reduction, and the likelihood of meeting cleanup goals established in the accelerated cleanup strategy



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Evolution of IPEP 8th Panel Meeting October 27, 2000

**Dr. Edgar Berkey
IPEP Chairman**



Evolution of IPEP

- ❖ Ralph Patt has become Vice Chairman
- ❖ Mike Kavanaugh will serve as Closeout Report Coordinator for the October, 2000 meeting
- ❖ IPEP will hold only full panel meetings
- ❖ IPEP will support on-going peer review efforts, primarily through the assignment of a liaison, as appropriate
- ❖ IPEP members can also take part in specific reviews where their expertise is essential

Upcoming IPEP Meetings (FY01) and Major Topic Areas

- ❖ Mid-March 2001
 - ◆ System Assessment Capability
 - Inventory/Vadose Zone Interface (Matuszek)
 - Groundwater/River Interface (Bassett)
 - Compliance Issues Affecting the IP (Patt)
 - Drilling Issues (Conaway)

- ❖ Mid July 2001
 - ◆ Prioritizing for FY02
 - ◆ TBD



In Summary. . .

- ❖ Integration at Hanford is not a milestone, an award fee criterion, or a destination. . .it is a journey over uncharted territory, water, and subsurface.
- ❖ We see significant work underway and progress being made. . .as well as growing evidence of integrated thinking.
- ❖ However, it is a long journey requiring continued commitment to reap the benefits that are possible.
- ❖ Keep it up!