

**ADDENDUM TO INSITU REDOX MANIPULATION EVALUATION OF POTENTIAL RADIONUCLIDE AIR EMISSIONS**

ISRM involves installation of a permeable barrier in the aquifer to intercept hexavalent chromium migrating with the groundwater. A pond is currently utilized to evaporate water collected from barrier extraction wells in the 100-D Area as part of the In-Situ Redox Manipulation. The temporary use of a low volume mister unit is proposed to enhance evaporation at the pond.

The unit will be positioned at the edge of the pond such that the mist is contained within the pond. The air/water mixture will be directed approximately parallel to the pond surface. The unit will only be operated while the ISRM site is manned and will be shut down if adverse weather conditions occur or are anticipated. This will ensure that the air/water mixture is contained within the confines of the evaporation pond. This system should be able to evaporate the necessary excess volume in the pond in a short period of time (one to three months). The system will not be operated beyond the end of September 2001.

**Concurrence**

Arlene C. Tortoso  
Arlene Tortoso  
U.S. Department of Energy, Richland Operations Office

5/10/01  
Date

Wayne Soper  
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Washington State Department of Ecology

5-14-01  
Date

Randy Acselrod  
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Washington State Department of Health

5-15/2001  
Date

**RECEIVED**  
JUN 07 2001

**EDMC**

**AIR QUALITY  
DOCUMENT****ISRM EVAPORATION ENHANCEMENTS**

The ISRM evaporation pond was constructed to allow collection of extraction water from barrier wells following injection of sodium dithionite. This approach was selected to reduce the cost of trucking and to eliminate disposal of extraction water via the proposed drip field.

The pond was sized for an upper limit of 2 million gallons to minimize the cost of leak detection and sampling required of larger capacity ponds (> 2 million gallons). The surface area of the pond was chosen based on the area available for pond construction, taking into consideration the underground existing piping and unknown subsurface piping and material reflected in ground penetrating radar surveys. The pond construction was complete in June of 2000.

Initially modeling of the pond capacity, to reflect the input volumes and evaporation rates, indicated the pond was capable of supporting the volume of the first two years (FY00 and FY01) of extraction with some potential of exceeding the capacity in late FY 2001. The plan was to add evaporation enhancements for the FY 2002 treatment activities. This modeling was based upon treating 10 wells in FY 2000 and 24 wells in FY 2001. In late FY 2000 the number of wells to be treated in FY2001 increased from 24 to 28.

In addition to the increase in the FY 2001 scope of wells to be treated the evaporation rates for FY01 have been much lower than the average for this period and the ISRM pond volume is increasing at a higher rate than anticipated. This will require that evaporation enhancements be added in the next several months.

Currently a drip hose has been relocated to the pond. The drip hose has been placed on the pond liner above the water line. A pump is pumping water from the pond via the drip hose to drip water on the liner and drain back into the pond. This will add heat to raise the pond temperature and will also cause evaporation of a portion of the water distributed to the liner above the water line. This enhancement may not be enough to improve the evaporation to remove the required volume for FY01.

We are evaluating a number of options to improve the evaporation rate. The criteria for this option is minimum rental/purchase cost, minimal infrastructure to implement, short period of time for achieving the added evaporation, and minimal operating costs.

The addition of a low volume misting enhancement is being reviewed. This approach will utilize a high volume air fan, operating at approximately 3600 rpm, directed at a water atomizing header. The fan will be located on the edge of the pond and air/water flow will be directed over the pond to assure any unevaporated liquid is contained within the pond. Directing the air/water flow approximately parallel to the pond will reduce the

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evaporation rate. The water in the pond will be pumped into the water atomizing header at a rate that minimizes the distance the water/air mixture will travel.

The evaporation rate will be determined by the flow rate of water that will meet the above criteria. The evaporation rate can be as high as 50 gpm but is expected to be less due to the limitation of water flow rate to the header and direction of the water/air mixture.

The unit will be operated during the time the ISRM site is manned. If any adverse weather conditions occur or are anticipated the unit will not be operated. This system will be able to evaporate the necessary excess volume in the pond in a short period of time (one-three months). Adequate pond volume will be removed during this period to eliminate the need to provide other enhancements in FY 2002.

**Concurrence**

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5/10/01  
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Washington State Department of Ecology

5-14-01  
Date

Attention: Lee Farrell  
Is this an addendum to 078536?  
Need note to file, why addendum.  
Also direction is needed if we need  
to submit to AR - list on distribution  
of Note to file

- Lee and DIS,  
- This is an addendum to 078536 (good point that  
I didn't catch, Thanks!)
- This addendum was to support the project's request  
to add a blower to increase evaporation from the  
pond and support ISRM.
  - We do need to have put in the Admin. Record

Thanks!  
Chris Key 2-9052

**CORRESPONDENCE COVER SHEET**

MI 089517

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Date Doc: 05/15/2001 Date Processed: 06/01/2001

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**ADDENDUM TO INSITU REDOX MANIPULATION EVALUATION OF POTENTIAL RADIONUCLIDE AIR EMISSIONS**

From	Org	To	Org	cc	Closes
ACSELROD, R	DOH	DIS			
SOPER, WW	ECOL				
TORTOSO, AC	DOE				

Area	Subject	OU	TSD	ERA
100D	6440	100-HR-3		
		REDOX MANIP		

**ACTION TRACKING**

Owed To	Org	Due	Owed By *	Org	Forecast

**DISTRIBUTION**

AR  
 ADMINISTRATIVE RE H0-09  
 BHI  
 CURRY, LR H0-19  
 FABRE, RJ X5-50  
 ISAACS, JD H0-19  
 KEMP, CJ S3-20  
 MITCHEM, GB H0-19  
 STRICKLAND, KH H0-21  
 WOOLARD, JG H0-02

\*Contact DIS Immediately To Reassign Action

*Handwritten signature and date: 5/15*