



**Rocky Flats Citizens Advisory Board
Recommendation 2005-2**

**Recommendation on the
Groundwater Interim Measure/Interim Remedial Action Document**

Approved February 3, 2005

Letter to:

Mr. Frazer Lockhart
U.S. Dept. of Energy
Rocky Flats Project Office
10808 Highway 93, Unit A
Golden, CO 80403

Re: Groundwater Interim Measure/Interim Remedial Action (IM/IRA)

Dear Frazer:

The Rocky Flats Citizens Advisory Board appreciates the opportunity to review, comment on, and make recommendations on the draft Interim Measure/Interim Remedial Action (IM/IRA) for Groundwater.

We found the document to be well done, outlining the decisions leading to the identification of groundwater plumes that may adversely affect surface water and potential groundwater treatment options. We appreciate the expertise that was used to develop the document, as well as the time and preparation that went into it.

The Board does have comments and concerns about the IM/IRA. We present the following recommendations for your consideration:

I. Post-accelerated action and post-closure monitoring is not adequately described in the document. The Board understands that the Groundwater Integrated Monitoring Plan (IMP) sets forth the specific monitoring requirements of each monitoring well and such things as the frequency of monitoring, the contaminants for which each well will be monitored, expected duration of monitoring, and the decision network to be used to determine contaminant trends. However, the Groundwater IM/IRA does not reference the IMP or any other document in discussion of monitoring. It is critically important that the document include this information. In particular, the IM/IRA does not include a discussion of how monitoring will be used to determine the success or failure of the remediation plans in the IM/IRA.

We, therefore, recommend that the Groundwater IM/IRA reference the Groundwater Integrated Monitoring Plan in the IM/IRA to describe the post-accelerated action monitoring network. We also recommend that the document include a discussion of how monitoring will be used to determine if the remediation actions outlined in the IM/IRA are successful.

II. The following comments are related to phytoremediation at the East Trenches downgradient plume and the Solar Evaporation Ponds downgradient plume. The Board has several concerns about phytoremediation.

A. As outlined in the IM/IRA, phytoremediation is the only remediation action that would be taken at the East Trenches downgradient plume and at the Solar Ponds downgradient plume. Yet, phytoremediation may be only seasonally effective because of winter-time dormancy in the plants that are used to uptake the volatile organic compounds (VOCs) in the East Trenches downgradient plume and nitrate and uranium in the downgradient Solar Ponds plume. This dormant period may be as long as six months and interfere with the efficacy of phytoremediation.

The East Trenches plume contains a high level of trichloroethene (TCE) contamination, which could negatively affect surface water quality in the B-Series ponds. Because of the dormant period, uptake of contaminants may be slowed or stopped, with the potential for TCE and other volatile organic compounds (VOCs) to negatively affect surface water quality.

We recommend, therefore, that the IM/IRA discuss the effect of the dormant period on phytoremediation.

We further recommend that the document discuss the fate of contaminants during the dormant period, the potential impacts on surface water quality, and any additional contaminant controls that may be required.

B. The document does not contain any provision for post-accelerated action monitoring of the plant community that will be used for the phytoremediation projects. The lack of intention to monitor the plant community could give stakeholders and the community the impression that the remediation plans are hastily constructed and are not a serious attempt to address this groundwater contamination.

We recommend the IM/IRA address monitoring of the plant community in the first three years to ensure the plant community used in phytoremediation is thriving and capable of performing the uptake of contaminants.

C. The Board is concerned that phytoremediation of volatile organic compounds (VOCs) may not be effective and asks the site to provide examples of successful phytoremediation of VOCs in a climate similar to that at Rocky Flats.

D. The Board is concerned that contaminants taken up into the plant will accumulate to concentrations that might be considered hazardous. In particular, the document does not address how the site plans to sample the plants to determine whether contaminant concentrations are hazardous and does not address how the site plans to dispose of the plants if contaminant levels are high enough to warrant off-site disposal.

The Board, therefore, recommends that the IM/IRA address how the site plans to sample phytoremediation plants for contaminants levels, and, further, how the site plans to harvest and dispose of the plants if contaminant levels are high.

III. The Board notes that the IM/IRA presents remediation plans for four of the five areas addressed in the IM/IRA. However, it offers no explanation as to why the document was published without a remediation plan for the 903 Pad/Ryans Pit Plume area. If remediation of this plume is still under investigation, why publish the IM/IRA before that investigation is completed?

The Board recommends that when a remediation plan is decided upon for the 903 Pad/Ryans Pit area, a separate document detailing the remediation plan and consequent stewardship considerations be released for a 45-day public comment period.

IV. The Board is concerned that there appears to be a lack of review built into the remediation plans. In particular, there does not appear to be any backup plans in the event that any one remediation project fails to accomplish the goal of contaminant reduction in the groundwater and the potential impact to surface water.

We recommend that backup plans be included in the document to address the failure of any of the treatment options at all four sites in the IM/IRA.

V. The Board has questions about the biodegradation process that is proposed for two of the groundwater plumes.

A. Biodegradation is proposed for several of the contamination plumes but there is no indication in the IM/IRA that laboratory testing has been done to optimize this part of the cleanup program. Several species of bacteria are needed to complete the dechlorination processes that break down chlorinated solvents. If any of the needed bacteria are not present, the dechlorination process may be incomplete, resulting in a buildup of chlorinated hydrocarbon intermediates that are also toxic contaminants that require further treatment. Laboratory tests with samples taken from the site are needed to determine whether bacteria should be added and which nutrients are required to optimize the dechlorination process.

We recommend that if the above-stated laboratory tests have been done, the IM/IRA include a description and the results. If such laboratory tests have not been done, plans for the testing program should be described.

B. There is no monitoring plan to determine if the biodegradation program is working properly.

We recommend a monitoring plan be developed or described in the IM/IRA to insure the biodegradation program is working properly.

VI. Although the Present and Original Landfills are not addressed in the IM/IRA, the Board is concerned that groundwater at these two sites may interact with the overall groundwater system. The Present Landfill, in particular, has groundwater flowing through it at a rate of two thousand to three thousand gallons per day. Much of the waste within the landfill is below the water level and the treatment at the point where the groundwater emerges to the surface consists flow over a series of flagstones.

We recommend that the IM/IRA include a discussion of how flows from the Present Landfill may affect surface water quality in the not unlikely event that contamination levels increase. We also recommend the IM/IRA address the effectiveness of the treatment system for removal of volatile organic compounds (VOCs) in cold weather.

VII. Passive groundwater treatments systems are mentioned several times in the document, yet there is no description of these systems or a reference to the cleanup document that describes the treatment systems.

We, therefore, recommend that the IM/IRA include reference to the document or documents that describe the treatment systems. We further recommend that the long-term performance of the groundwater treatment systems be addressed in the IM/IRA with a discussion of how treatment system performance will be evaluated and what corrective measures will be taken if performance degrades below acceptable levels.

VIII. The maps in Section 7, which include Figures 7-1 to Figure 7-5, are confusing in several ways. Figure 7-1, for instance, contains colors on the map that are not explained in the map key. In Figure 7-1, we understand that yellow bounded by red or blue represents either a potential area of concern or under building contamination. However, Figure 7-1 contains bright yellow coloring in some places that is not defined so one does not know what the yellow stands for. Also in Figure 7-1 are outlines of buildings with hatch marking but no indication of what the hatch marking means. This figure also includes two colors - one for the composite VOC Plume and one for the Nitrate Plume - that are quite similar and are indistinguishable on the map, so that it is impossible to tell where each plume is located. Figure 7-2 contains several red colors that could lead to similar types of confusion. Also it would be helpful on these maps if the direction of groundwater flow were noted. Please note that roadways on these maps are outlined in a light color that is very difficult to see. Also, please note that it is difficult to relate comments in the text with features on the figures. It would be helpful to compare the narrative to the figures to make sure the two mirror each other.

It is a justifiable concern that future stakeholders doing research on Rocky Flats post-closure would find these maps confusing.

We, therefore, recommend that Figures 7-1 to and including Figure 7-5 in the Groundwater IM/IRA be amended, as follows: Maps should

exclude colors on the map that are not addressed in the Key legend; colors in the legend should not be similar; very light colors to delineate roadways should be changed to dark lines because the light colors are very difficult to see; and the figures themselves should correspond more closely with the narrative presented in Section 7.

We look forward to your comments on our recommendations and hope our comments will be helpful in improving the Groundwater Interim Measure/ Interim Remedial Action.

Sincerely,

Gerald L. DePoorter
Chair

cc: Steve Gunderson, Colorado Department of Public Health and Environment (CDPHE)
Mark Aguilar, U. S. Environmental Protection Agency (EPA)
Norma Casteneda, U.S. Department of Energy
Karen Wiemelt, Kaiser-Hill

The Rocky Flats Citizens Advisory Board is a community advisory group that reviews and provides recommendations on cleanup plans for Rocky Flats, a former nuclear weapons plant outside of Denver, Colorado.

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