The State
of Wyoming

Department of Environmental Quality

Jim Geringer, Governor

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July 12, 1999

Mr. Roy Spears
U.S. Department of Energy - Federal Energy Technology Center
P.O. Box 880
Collins Ferry Road
Morgantown, West Virginia 26507-0880

RE: Final Report for U.S. Department of Energy (DOE) Grant No. DE-FG21-92MC29424

Dear Mr. Spears:

As required by the terms of the above referenced grant, the following summary serves as the Final Report for that grant. The grant relates to work performed at two separate sites, the Hoe Creek Underground Coal Gasification Site south of Gillette, Wyoming, and the Rock Springs In-Situ Oil Shale Retort Site near Rock Springs, Wyoming. The primary concern to the State of Wyoming at each site is ground water contamination (the primary contaminants of concern are benzene and related compounds), and the purpose of the grant has been to provide funding for a Geohydrologist at the appropriate State agency, specifically the Land Quality Division (LQD) of the Wyoming Department of Environmental Quality. The LQD Geohydrologist has been responsible for providing technical and regulatory support to DOE for ground water remediation and subsequent surface reclamation. Substantial progress has been made toward remediation of the sites, and continuation of LQD involvement in the remediation and reclamation efforts is addressed in Grant No. DE-FG26-98FT40488.

Hoe Creek

At two areas (Hoe Creek II and III) within the Hoe Creek Sites, gasification experiments adversely impacted ground water quality. During the initial stages of the grant, the purposes of the work at the site were to refine the characterization of the contaminant distribution in ground water and select an effective remediation option based on the characterization and remediation efforts to date. Field work at that time focused on: (a) pilot tests of the proposed air sparge ground water remediation system; (b) periodic ground water sampling to evaluate continued contaminant dispersal; and (c) ground water tracer and soil gas sampling experiments. Report reviews included: the Draft Remediation Alternatives Evaluation; the Project Management Plan for the pilot test; and summaries of various ground water sampling results and analytical quality control evaluations.

More recently, the purposes of the work at the site have been to operate the 'full-scale' air sparge ground water remediation systems at Hoe Creek II and III. Periodic ground water sampling has continued to evaluate contaminant distribution. Report reviews have covered a variety of topics. A series of progress reports was reviewed on the pilot testing at the Hoe Creek II and III Areas. These reports focused on the

effectiveness of the air sparging, in particular quantifying the 'rebound' of contaminant concentrations when the air sparge system was off. Designs for the full-scale system were reviewed prior to construction. A series of reports was also presented on the start-up of the full-scale systems, in particular the well performance testing and initial ground water sampling. Summaries of various ground water sampling results and analytical quality control reviews were also reviewed. Most recently, discussions of the regulatory and practical requirements for site closure, including water rights as well as water quality issues, 'stability' sampling, and similar issues, have been given emphasis.

Rock Springs

Fracturing experiments were conducted at 10 of the 12 proposed retorts at this site, and retort experiments were subsequently conducted at 5 of those 10 proposed retorts. When the grant was first authorized, it was known that ground water contamination existed at at least one of the retort sites (Retort 9), but it was not clear at which of the other retorts contamination existed or the extent of the contamination at any of these areas. The retorts are in the Tipton Formation, and there were also concerns about potential interaquifer communication with the deeper Wasatch Aquifer. The purposes of the initial work at this site were to characterize contaminant distribution in ground water and evaluate possible remediation options. Field work included: (a) a pilot test for ground water remediation at Retort 9; (b) installation and sampling of three alluvial wells to help evaluate ground water flow; and (c) periodic ground water sampling to evaluate continued contaminant dispersal. Report reviews included: the Draft Remediation Alternatives Evaluation; drafts of work plans for the pilot testing; and summaries of various ground water sampling results and analytical quality control reviews. Well installation and casing integrity information on the Wasatch Aquifer wells was reviewed. An extensive review of the available information on the fracturing and retorting activities at each of the 12 proposed retorts was also prepared to help plan additional well installation.

More recently, the purposes of the work at the 5 oil shale retorts underlying this site have been to characterize contaminant distribution in ground water and evaluate possible remediation options. Field work has included: (a) installation and sampling of wells at four retorts (Retorts 4, 6, 7, and 12) to verify the presence or absence of contamination at these retorts; (b) abandoning existing Wasatch Aquifer wells (which were determined to have poor casing integrity) and installation and sampling of two wells in the Wasatch Aquifer verify the presence or absence of cross-communication with the Tipton Formation; and (c) pilot testing of air sparge systems at Retorts 4, 9, and 12; Report reviews have included: summary reports on the well installation and sampling; work plans for and progress reports on pilot testing (including 'rebound'); and summaries of various sampling results and analytical quality control reviews.

If you have any questions or need additional information, please call me at (307) 777-5922.

Sincerely,

Roberta Hoy

Roberta Hoy
DOE Geohydrologist

xc: Stephen S. Toalson, Jr.

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