DOE/OR--97008006

Department of Energy

Oak Ridge Operations

Weldon Spring Site

Remedial Action Project Office

7295 Highway 94 South

St. Charles, Missouri 63304

May 9, 1997

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QUARTERLY ENVIRONMENTAL DATA SUMMARY FOR FIRST QUARTER 1997

In support of the Weldon Spring Site Remedial Action Project Federal Facilities Agreement, a copy of the Quarterly Environmental Data Summary (QEDS) for the first quarter of 1997 is enclosed.

The data presented in this letter and attachment constitutes the QEDS. The data were received from the contract laboratories, verified by the Weldon Spring Site verification group and, except for air monitoring data, merged into the data base during the first quarter of 1997. Air monitoring data presented are the most recent complete sets of quarterly data. Air data are not stored in the data base.

Significant data, defined as data values that have exceeded defined "above normal" values, are discussed in this letter for Environmental Monitoring Plan (EMP) generated data only. Above normal values are based, in ES&H procedures, on historical high values, DOE derived concentration guides (DCGs), NPDES limits and other guidelines. The procedures also establish actions to be taken in the event that "above normal" data occur.

All data received and verified during the fourth quarter were within a permissible range of variability except for those detailed below. Above normal occurrences are cited for groundwater data and NPDES. There were none for air, surface water or springs. The following discussion offers a brief summary of the data that met the above normal criteria merged during the first quarter and updates on past reported above normal data. The attached tables present the most recent air data and all the data merged into the data base during the first quarter 1997 for groundwater, NPDES, surface water, and springs.

Graphs showing concentrations of selected contaminants of concern at some of the critical locations have also been included in this QEDS. The graphs are discussed in the separate sections.

NPDES

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The uranium concentrations at the three major NPDES outfalls are graphed for November and December 1996 and January, February and

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March 1997. The graph is located at the beginning of the NPDES tables. For comparison purposes, the annual average for 1996 is also graphed and the derived concentration guide (DCG) of 600 pCi/l for uranium is noted. The DCG is the concentration of a radionuclide in air or water which, under conditions of continuous exposure for one year by one exposure mode (i.e., ingestion of water), would result in an effective dose equivalent of 100 mrem. This is an administrative level established by the Department of Energy to maintain doses to members of the public "as low as reasonably achievable" (ALARA). Outfall NP-0010, the CMSA sedimentation basin outfall, has remained below the 1996 annual average and, because the area has been remediated, it is expected to remain so. Outfalls NP-0002 and NP-0005 have remained below the 1996 average except for March of 1997. The March sample was collected when the runoff was tailing off from an all day light rain. Uranium concentrations tend to be higher during this stage of the runoff. The remediation for the NP-0002 and NP-0005 watersheds has been completed, and after some initial fluctuations, the levels for uranium are expected to level off at low concentrations. The uranium levels at NP-0003 have been higher (except for the November 1996 sample) than the 1996 average. While most of the Outfall NP-0003 watershed has been remediated, the NP-0003 watershed contains Ash Pond where contaminated soils, concrete, etc., are being stored. This has contributed to the higher levels at NP-0003. In addition, uranium levels from Ash Pond have tended to be higher during the winter months. Although water is not released from the Ash Pond area if it is greater than 600 pCi/l, it may be higher than the 1996 average (at Outfall NP-0003), and thus, may contribute to higher levels at NP-0003. At no time did uranium concentrations at the three major outfalls exceed the DCG of 600 pCi/l.

There was one above normal sample at an NPDES outfall during the first quarter of 1997. The above normal sample, and above-normal samples that were not resolved in previous QEDS, are discussed below.

NP-0002-022097

Settleable solids for the sample collected at Outfall NP-0002 on February 20, 1997, were 5.5 ml/l/hr. The permit limit is 1.0 ml/l/hr. (Total suspended solids of 2,440 mg/l for this sample reflected the high settleable solids.) An unstabilized soil pile at the adjacent highway department facility was a major contributor to the high solids level. The PMC contacted the highway department and the highway department subcontractor erected several silt fences downstream of the piles. Subsequently, the PMC installed two sand bag check dams downstream of the silt fences and a rock check dam in the main channel just upstream of Outfall NP-0002. In addition, willow

cuttings and cat tails have been planted in the channel above outfall NP-0002 as a natural method to slow flow and trap sediment. A subsequent sample collected on March 10, 1997, was in compliance at less than 0.1 ml/l/hr. The PMC will continue to monitor settleable solids and inspect the watershed on a regular basis.

• NP-0005-110796, NP-0005-012297

The November 7, 1996, sample collected at outfall NP-0005 had an analytical result for Radium-226 (2.26 pCi/l) that was above the baseline value of 1.06 pCi/l. Radium - 226 is not a permitted parameter and there is no permit notification level. The elevated level is believed to be the result of higher than normal total suspended solids in the water in combination with upstream remediation efforts. This outfall was again sampled for Radium-226 on January 22, 1997, with an analytical result of 0.821 pCi/l (below the baseline). Periodic monitoring for radium will continue.

The analytical results for the NPDES outfalls are reported in the quarterly discharge monitoring report as well as in this report.

GROUNDWATER

Weldon Spring Chemical Plant Site

Site Water Treatment Plant and Temporary Storage Area

Sample Numbers GW-2037-Q496, GW-2037-0197, and GW-2037-0297

New historical high concentrations of the volatile organic compound (VOC) trichloroethene (TCE) were reported for the first quarter of 1997 at this location, which monitors groundwater along the western edge of the temporary storage area (TSA). The TCE results for samples collected in December 1996 and January and February 1997 were 1100 ug/l, 1200 ug/l, and 1300 ug/l, respectively. This location is included in the on-going, site-wide VOC groundwater investigation, which began in April, 1996.

• Sample Numbers GW-2038-Q496, GW-2038-0197, and GW-2038-0297

The fourth quarter VOC concentrations reported for samples from the MW-2038 groundwater monitoring location indicate decreasing levels of TCE. This monitoring well is situated between the south side of Raffinate Pit 3 along the north boundary of the temporary storage area. Levels reported for the previous quarter

were above 1000 ug/l. The TCE concentrations in samples collected in December 1996, January 1997, and February 1997; were 860 ug/l, 790ug/l and 860 ug/l, respectively, all of which are above the MCL of 5 ug/l. The MW-2038 sampling location is sampled monthly as part of the ongoing VOC impact investigation. Other investigation requirements are being developed.

- Sample Numbers GW-2040-Q396 and GW-2040-Q496

In an attempt to address a third quarter above-normal value for the metals lead and chromium, the fourth quarter sample was collected following three full-well volumes purged to reduce the potential for collection of water that has been in prolonged contact with the stainless steel well casing material.

The third quarter 1996 sample lead value(6.4 ug/l) was above baseline level (3.3 ug/l), but below the drinking water quality standard of 15 ug/l. The fourth quarter sample data (4.1 ug/l) were again above the baseline for lead. The reported chromium concentration (29.2 ug/l) was also above the baseline of 14.1 ug/l for this location. Monitoring well MW-2040 is located on the north side of the site water treatment plant equalization basin along the south side of the site water treatment plant Train I structure. Three additional wells that monitor the equalization basin, which are 100 feet to 150 feet down-gradient and cross-gradient from MW-2040, show no lead impact. The sources of the elevated lead and chromium are unknown and are under investigation because, although the three-volume purge reduced the potential for leaching of metals from the stainless steel well construction material, lead and chromium were still above baseline. Treatment plant influent chromium and lead values were not elevated and no other anomalous basin leachate values (such as elevated uranium) were identified.

Further investigation of potential sources is ongoing and includes sampling the water treatment plant sump, sampling the interceptor trench located between the equalization basin and Raffinate Pits 1 and 2, investigating the use of acids and salts in and around the treatment plant, and comparing metals analysis of a filtered sample duplicate with an unfiltered sample. The above-baseline values listed in this report are from unfiltered samples. The baseline values to which the current analytical results are compared were established utilizing values from filtered samples. The investigation findings should be useful in determining whether the difference in sample preparation methods (filtered vs. unfiltered) has a significant impact on analytical results.

- Sample Numbers GW-2042-Q396 and GW-2042-Q496

The MW-2042 sampling location is along the south side of the site water treatment plant equalization basin. The third and fourth quarter samples for chloride (15.8 mg/l and 20.6 mg/l) were above the baseline level of 11.3 mg/l. The source of elevated chloride is unknown. The source of the elevated chloride values around the water treatment plant may be acids used at the decontamination pad or road salts used around the plant. The elevated chlorides may also be related to the above-normal metals value at nearby location MW-2040 which is currently under investigation as described in the previous paragraph.

Disposal Cell

Groundwater sampling from the site disposal cell detection monitoring well network was initiated during the first quarter of 1997. The wells MW-2045 through MW-2048 (installed during late 1996-early 1997) and MW-2032 will be sampled quarterly during 1997 to determine baseline groundwater contaminant concentrations. Abnormal or unexpected values will be reported in subsequent QEDS as the analytical results become available.

Weldon Spring Chemical Plant and Raffinate Pits

- Sample Numbers GW-2013-0197 and GW-2013-0297

The VOC 1,2-dichloroethene was detected in the January 1997 sample from this location, along the south side of Frog Pond, at 15 ug/l, but the February 1997 sample was below the 10 ug/l detection limit. The VOC source at this sampling location is suspected to differ from that which impacts the area around Raffinate Pits 3 and 4, since TCE is not the primary VOC contaminant. Even though the source is suspected to be different, this sampling location has been included in the site VOC groundwater investigation and will continue to be monitored through 1997.

- Sample Numbers GW-3025-121896 and GW-3025-0197

TCE was monitored at this location during the fourth quarter of 1996 (27 ug/l) and first quarter of 1997 (38 ug/l). This location is along the east side of Raffinate Pit 3 and is included in the current VOC investigation mentioned in the previous paragraphs. These TCE concentrations do not indicate

any significant change in concentration from the third quarter 1996 sample (GW-3025-Q396 = 29.0 ug/l). The values exceed the MCL of 5 ug/l.

Weldon Spring Quarry Site

Quarry Water Treatment Plant

- Sample Numbers GW-1036-Q296, GW-1036-Q396 and GW-1036-Q496

The fourth quarter sample for monitoring location MW-1036 was again above the baseline level of 102 mg/l for chloride at 120 mg/l. Chloride concentrations above baseline levels were also reported in two previous QEDS. The second quarter 1996 sample value (518 mg/l) was the highest recorded for this location. Third quarter data (130 mg/l) indicate that the chloride concentration remains above baseline level, but is significantly decreasing. The fourth quarter chloride (120 mg/l) concentration indicates that the values are continuing to decrease and are now near baseline. Chromium was reported above the baseline level of 7.57 ug/l in the previous quarter, but it has decreased to 6.4 ug/l, which is within baseline. The chloride impact, and the related increase in metals concentration, were most likely due to the use of hydrochloric acid used for cleaning equipment during late 1995 and early 1996 at the decontamination pad, which was in need of repairs. Cracks in the decontamination pad were repaired in August 1996, and the chloride and chromium values are decreasing as expected.

- Sample Numbers GW-1040-Q296, GW-1040-Q396, and GW-1040-Q496

Three consecutive chloride historic highs above the baseline concentration of 10.9 mg/l for this location have been reported. HCl was used in the quarry decontamination area during late 1995 and early 1996. The chloride concentration has not decreased at this location as quickly as the MW-1036 sampling location. The chloride value decreased from 25.8 mg/l in the second quarter sample to 21 mg/l in the third quarter sample, but increased to 31 mg/l for the fourth quarter. Cracks in the decontamination pad at the quarry were repaired in August 1996. Subsequent data are expected to show decreases in chloride values.

Quarry Vicinity

- Sample Numbers GW-1005-B596 and GW-1005-B696

Two consecutive new historic highs for total uranium were reported for the fifth and sixth bimonthly 1996 samples (5380

pCi/l and 6920 pCi/l) from this location. This well had been dry from mid-1995 to late 1996 due to groundwater level decreases resulting from quarry pond dewatering. It is possible that contaminated residual sediments that have accumulated in bedrock conduits, through which groundwater flows to this location, are being remobilized as the groundwater level rises and recharges the well. When sufficient water volume recharges this well, additional surging and purging of the groundwater in MW-1005 will be performed to determine if residual sediments are the source and, if so, subsequent samples should show decreasing total uranium activity. Further, first quarter 1997 samples collected from this location included a filtered replicate that will be compared to the standard unfiltered sample to determine the potential for suspended solids contributions to the increased total uranium activity.

St. Charles County Well Field

- Sample Numbers GW-PW08-Q496 and GW-RAWW-Q496

Gross alpha values were reported above the MCL of 15 pCi/l for the St. Charles County pumping well PW-08 (21.1 pCi/l) and the for the raw water intake at the county water treatment plant (73.9 pCi/l). These values are believed to be in error for the following reasons. No wells upgradient or crossgradient from PW-08 showed any increased alpha or total uranium activities. Further, the RAWW sample is a composite of all wells pumping to the treatment plant and should approximately equal the average gross alpha value of the wells contributing to the treatment plant. The reported average for this sampling event during fourth quarter 1996 was 5.6 pCi/l. The treated water sample from the plant (GW-FINW-Q496) had a gross alpha activity of 2.57 pCi/l.

Total uranium activities during the last four sampling events for groundwater in the St. Charles County well field are shown graphically at the beginning of the Groundwater Tables.

SURFACE WATER

No elevated contaminant values were reported in surface water samples for the quarter.

SPRINGS

No elevated contaminant levels were reported for Burgermeister Spring during this quarter.

AIR

There were no above normal samples for air monitoring for the first quarter of 1997. Data for the monitoring locations are attached. Graphs of the monitoring results are located in front of the tables.

The gross alpha concentration for air particulate monitoring for the first quarter 1997 are graphed with the background level and background plus 3 standard deviations shown for comparison. The background level is based on monitoring conducted from the second quarter 1996 to the first quarter of 1997. The background location is AP-4012 at the Daniel Boone Elementary School in New Melle.

The gamma exposure from environmental TLD monitoring results for the fourth quarter 1996 are graphed with the background and the background plus 25 mrem quarterly committed effective dose equivalent (CEDE) shown for comparison. The 25 mrem CEDE is based on one-fourth of the annual 100 mrem CEDE established in DOE Order 5400.5. The background locations are TD-4005 (west of the Army site) and TD-4009 (Daniel Boone Elementary School in New Melle).

The alpha track radon and thoron monitoring results are graphed for the fourth quarter of 1996. The background level (based on 1996 monitoring) and the derived concentration guide (DCG) for radon and thoron are shown for comparison. The DCG is a reference value for protection of the public and the environment contained in DOE Order 5400.5. Although some locations are above the DCG they are all within the site boundary. All locations identified with R3--are located inside the WSSRAP fence line. The background locations are TD-4005 (west of the Army site) and TD-4009 (Daniel Boone Elementary School in New Melle).

SUMMARY

The previously described data were highlighted as being above prescribed baseline values, varying from historical ranges or being above regulatory limits, and as a result, are subject to more focused attention by the WSSRAP Environmental Protection Group. Continuous trends are monitored to determine the need for additional possible action. Except for the highlighted data, all other indicators subject to reporting in the QEDS were within historic range or below reporting criteria.

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If you have any questions, please contact the WSSRAP Community Relations Department at (314) 441-8086.

Sincerely,

Stephen H. McCracken
Project Manager
Weldon Spring Site
Remedial Action Project

Enclosure:
As stated