Department of Energy

ROCKY FLATS OFFICE
P.O. BOX 928
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000030256

AUG 0 9 1993

93-DOE-09089

Mr. Gary Baughman
Hazardous Waste Facilities Unit Leader
Colorado Department of Health
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

Dear Mr. Baughman:

The Department of Energy at the Rocky Flats Office (DOE/RFO) has completed the acceptance testing phase of the B910 evaporator facility at the Rocky Flats Plant. The tests were completed on June 24, 1993, four days ahead of the schedule we provided to you in January 1993, and the analytical results have been received. The three evaporators produced distillate with an average conductivity of 11 umho/cm for Unit 1, 30 umho/cm for Unit 2 and 21 umho/cm for Unit 3. Conductivity of the distillate is required by the CDH reuse criteria to be below 150 umho/cm. Conductivity is the measurement which will be used to determine the quality of the distillate for transfer to the raw water system. The results of distillate analyses required in the Interim Measure/Interim Remedial Action (IM/IRA), Appendix B, Table 2 are presented in the attachment. Table 1 lists those constituents for which 40 CFR 141 Subpart B standards are available; Table 2 lists the remainder of the constituents.

Additional data were also collected; 1) to compare the Table 1B and 2 constituents to the drinking water standards of 40 CFR 141, 2) to provide a standard suite of measurements that cover more analytes than the minimum required by the IM/IRA and 3) to fulfill internal operational needs. These data are also presented in the enclosure. Note that the drinking water standards from Subpart G are included with the additional data. Subpart G data are not required by the IM/IRA, but are included for interest.

DOE/RFO is therefore pleased to inform you that the facility has passed the acceptance test phase, as required by the IM/IRA, and that DOE/RFO has designated the evaporators as operational on July 26, 1993. The facility is therefore operational well ahead of the September 9, 1993, date committed to you last January.

Should you have any questions or require further information please contact me on 966-7846

Sincerely,

Frazer R. Lockhart
SPRP Manager
Environmental Restoration Division

Enclosure

cc w/ Enclosure:
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Settlement
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TABLE 1
Results for IM/IRA Table 2 Constituents
Constituents with 40 CFR 141 Subpart B Standards

Distillate Parameter*	MCL	UNIT 1 Distillate	UNIT 2 Distillate	UNIT 3 Distillate
Arsenic	0.05	U	U	U
Chromium	0.1	U	0.0044 B	U
Mercury	0.002	U	U	U
Nickel	0.1	U	0.0090 B	U
Selenium	0.05	U	U	U
Gross Alpha / Beta	15 / -	0.165 0.060	0.363 0.067	0.485 0.474
Nitrate as N	10	0.35	0.32	1.14
Fluoride	4.0	U	U	U

U = not detected
B = also found in the blank (results shown are not corrected for the blank)
* units are pCi/l for radioactivity, all others mg/l

Attachment 2
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TABLE 2
Results for IM/IRA Table 2 Constituents
Other Constituents

Distillate Parameter*	UNIT 1 Distillate	UNIT 2 Distillate	UNIT 3 Distillate
Conductivity	11	30	21
Boron	U	U	U
Calcium	0.33 B	0.65 B	0.64 B
Copper	0.0076 B	0.152 B	0.0046 B
Lithium	U	U	U
Magnesium	0.079 B	0.13 B	0.23 B
Manganese	0.0040 B	0.0056 B	0.0039 B
Molybdenum	U	U	U
Potassium	U	U	U
Silicon	0.087 B	0.18 B	0.092 B
Sodium	0.82 B	1.63 B	1.97 B
Strontium	0.0033 B	0.0055 B	0.0066 B
Zinc	0.0075 B	0.12 B	0.0058 B
pH	6.0	6.5	6.8
Cyanide, total	U	0.03 B	0.0014 B
Acetone	U	0.011	U
Atrazine	0.00037 J	U	0.00087
Carbon Tetrachloride	U	U	U
Chloroform	0.0020	0.0025	0.0010
Diethyl phthalate	U	U	U
Di-n-butyl phthalate	U	U	U
Methylene chloride	0.0009	0.0005 B	0.0010
Nitrophenol	U	U	U
Pentachloro phenol	U	U	U
Trichloroethene	U	U	U
Ethylhexyl phthalate (2 bis)	0.012	0.009 B	0.011 B
Ammonia	U	0.20	U
Chloride	0.25	0.43	0.48
Carbonate	U	U	U
Bicarbonate	3.0	6.3	3.4
Phosphate, total	0.085	0.48	0.02
Phosphate, ortho	0.087	0.26	0.02
Sulfate	U	U	U
Sulfite	U	U	U
Alkalinity	3.0	6.3	3.4
TDS	U	14.5	U
TOC	1.1	5.7	2.7

* Conductivity in umho/cm, all other values in mg/l
U = not detected; J = value estimated;
B = also found in the blank (values are not corrected for the blank)

Attachment 3
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B910 ACCEPTANCE PHASE QUALIFICATION TEST

Summary of Treatment Test Analytical Results

STREAM	ANALYSIS mg/l unless noted	40 CFR 141 Subpart B&G STAND'RD	UNIT 1 6/22/93	UNIT 2 6/18/93	UNIT 3 6/24/93	RESULT
FEED	conductivity umho/cm	na	2790*	2770*, 2680	2820*, 2810	
	pH units	na	8.47*	8.08*, 7.2	8.32*, 7.89	
	silica silicon	na	2.9* 2.2	8.4* 2.740	2.6* 1.990	
	chloride (fluoride)	na	80 (1.0)	81 (0.9)	82 (1.0)	
	total hardness Ca + Mg	na	630* 143+50=193	650* 144+52=196	625* 136+50=186	
	calcium hardness calcium	na	415* 143	385* 144	390* 136	
	total alkalinity @ [(2)CO_3 + HCO_3 = alk]	na	175* 4 + 160 alk = 168	215* U + 150 alk = 150	175* 2 + 130 alk = 134	
	total alpha pCi/l	na	38.280	162(screen) 56.0 (lab)	78.700	
	(total beta pCi/l)	na	51.770		50.010	
	TDS DL 10	na	1380* 2300	1390* 2200	1420* 2200	
	(Sulfate) (TSS)		(120) (11)	(130) (10)	(120) (13)	
DISTILL'TE misc	pH	na	6.0	6.5	6.8	PASS
	conductivity umho/cm +/- 10	CDH reuse: ≤ 150	10.7	30	21	PASS
	total cyanide	0.2	U	U	0.0014 BU	PASS
	nitrate as N	10	0.383 0.325	0.27 0.35	1.25 1.05	PASS
	total alpha	15 pCi/l	0.165	0.363	0.485	PASS
	total beta	-	0.060	0.067	0.474	PASS
	total alkalinity @ [(2)CO_3 + HCO_3 = alk]	na	3	6.3	3.4	PASS
	TDS	na	U	14.5	U	PASS

Attachment 3
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B910 ACCEPTANCE PHASE QUALIFICATION TEST

Summary of Treatment Test Analytical Results

	TOC	na	1.1	5.7	2.7	PASS
metals	magnesium	na	0.079 B	0.128 B	0.227 B	PASS
	manganese	na	0.0040 B	0.0056 B	0.0039 B	PASS
	mercury	0.002	U	U	U	PASS
	molybdenum	na	U	U	U	PASS
	calcium	na	0.331 B	0.651 B	0.642 B	PASS
	nickle	0.1	U	0.0090 B	U	PASS
	total chromium	0.1	U	0.044 B	U	PASS
	strontium	na	0.0033 B	0.0055 B	0.0066 B	PASS
	copper	na	0.0076 B	0.152 B	0.0046 B	PASS
	zinc	na	0.0075 B	0.118 B	0.0058 B	PASS
	arsenic	0.05	U	U	U	PASS
	selenium	0.05	U	U	U	PASS
	potassium	na	U	U	U	PASS
	boron	na	U	U	U	PASS
	lithium	na	U	U	U	PASS
	silicon	na	0.087 B	0.182	0.092 B	PASS

anions	ammonia	na	U	0.2	U	PASS
	carbonate/ bicarbonate	na	U / 3	U / 6.3	U / 3.4	PASS
	phosphate, ortho as P	na	0.087	0.26	0.02	PASS
	phosphate, total	na	0.085	0.48	0.02	PASS
	sulfate	na	U	U	U	PASS
	sulfide	na	U	U	U	PASS
	chloride	na	0.25	0.43	0.48	PASS
	fluoride	4.0	U	U	U	PASS
organics	acetone	na	U	0.011	U	PASS
	atrazine	0.003	0.00037 J	U	0.00087	PASS
	bis(2-ethyl hexyl) phthalate	0.006	0.012	0.009 BJ B = 0.014	0.011 B B = 0.009	PASS common lab contaminant, found in the blanks
	carbon tet	0.005	U	U	U	PASS
	chloroform	na	0.002	0.0025	0.001	PASS
	diethyl phthalate	0.006	U	U	U	PASS
	di-n-butyl phthalate	0.006	U	U	U	PASS
	methylene chloride	0.005	0.0009	0.0005 B	0.001	PASS
	nitrophenol	0.001	U	U	U	PASS
	pentachloro phenol	0.001	U	U	U	PASS

B910 ACCEPTANCE PHASE QUALIFICATION TEST

Summary of Treatment Test Analytical Results

	trichloro ethene	0.005	U	U	U	PASS
BRINE	Gross Alpha/ Gross Beta pCi/l	(B374 limits, 13,500 pCi/l for isotopes)	217 +/- 220 1130 +/- 888	210 +/- 324 <1000	99 +/- 59 na	
	pH units	(B374 requires ≥2)	7.94, 8.22	10.55, 9.91	8.8, 8.7	
	Density	(Ops need)				
	EDTA Study Numbers*: pH conductivity TDS Total Hardness Ca Hardness Alkalinity Silica Excess EDTA					

Notes:

40 CFR 141 Maxmium Concentration Limit standards shown in this table include primary drinking water standards from Subparts B and G. Only Subpart B called out in IM/IRA.

* Designates results from Technology Development, analyses performed in B910. For EDTA numbers, see TD report; there are two brine locations and some time-effects expected.

@ Using carb, bicarb, and hydroxide as the only sources of negative ions:
$[H^+] = [OH^-] + 2[CO_3^{-2}] + [HCO_3^-]$
but, if pH < 7, values of $[OH^-]$ and $[CO_3^{-2}]$ are negligible
(confirmed by results above; carbonate measured at "U")
so concentration of $[OH^-]$ also neglected in this calculation

IDL is the instrument detection limit.

B = found in blank; results are not corrected for the blank.
J = estimated value.
U = not detected.

(Compounds listed in parentheses are extra analyses recorded here for interest.)