

[illegible]

TABLE 1: Radium 226 analyses of Tank Bottoms

Tank #	Size (bbls)	Diameter (ft)	Height (ft)	Thickness of Tank Bottoms	Estimated Amount of Tank Bottoms (bbls)	Date of Analyses	Ra 226 Result (pCi/g)
D-1	20,000	68	28.5	16-18 in	862-970	06/18/1996	21.7
D-2	500	16	16	1.5ft	54	05/20/1997	Not tested
D-3	500	16	16	1 ft	39	05/20/1997	Not tested
D-4	320	12	16	1-3 in	<5	05/20/1997	3.07 pCi/gm
D-5	286	16	8	1-3 in	<5	05/20/1997	42.71 pCi/gm
D-6	141	12	7	1-3 in	<5	05/20/1997	BDL
D-7	48	7	7	1-3 in	<5	05/20/1997	253.67 pCi/gm
D-8	48	7	7	1-3 in	<5	05/20/1997	BDL
D-9	286	16	8	1-3 in	<5	05/20/1997	48.18 pCi/gm
D-10	23	5	5	3-4 ft	13-18 water	05/20/1997	Not tested
D-11	420	10	30	< 2 ft	<30	05/20/1997	180.65 pCi/gm
Separator						05/20/1997	BDL
D-12	75	10	10	1-3 in	<5	05/20/1997	3.96 pCi/gm
D-13	300	12	15	<12 in	<20	05/20/1997	BDL
D-14	150	10	10	empty	0	05/20/1997	Not tested
U-1	472	15	30	2-3 ft	63	05/20/1997	24.93 pCi/gm
U-2	179	8	20	<6 in	<5	05/20/1997	117.41 pCi/gm
U-3	140	10	10	empty	0	05/20/1997	Not tested
U-4	300	12	15	<12 in	<20	05/20/1997	BDL
U-5	300	12	15	<12 in	<20	05/20/1997	BDL

TABLE 3: Locations of impacted soil treated by aeration and phytoremediation

Location	Description	Length (ft)	Width (ft)	Depth (ft)	Total Volume
Paraffin Pits Closed In Place					
WK-1	Pit with some crude/water	5	6	4	120
Well #15	Pit with some crude/water	4	8	3	96
Well #05	Pit with some crude/water	20	30	5	3000
Well #55	Pit with some crude/water	2	3	10	60
Well #01 (Reeder #1)	Pit with some crude/water	7	7	4	196
Well # 52	Previously filled pit/some soil moved to treatment cell	10	10	5	500
Total Volume Closed in Place					3972
Surface Impact Treated With Aeration and Phytoremediation					
Location	Description	Length (ft)	Width (ft)	Depth (ft)	Total Volume
Ditch between Pond B/C	Light soil impact	80	3	1	240
Near Tank Battery	Light soil impact	5	5	2	50
Near Tank Battery	Soil impact	30	10	0.5	150
Pond A banks	Light soil impact	40	5	1	200
Staining east of pond A	Soil impact	20	10	2	400
Pond B	Light soil impact	30	5	1	150
Pond B	Light soil impact	30	10	1	300
Pond C	Light soil impact	20	3	1	60
Pond C	Light soil impact	60	20	2	2400
Pond F	Light soil impact	10	5	1	50
Pond F	Light soil impact	10	10	1	100
WE 4	No impact, borrow pit				
WE-6	Pit naturally restored				
WK-1	Light soil impact on pad	5	3	2	30
Tank on hillside above 20,000 Bbl tank	Surface impact	50	27	1.5	2025
Well #4	Pit with light soil impact	4	2	1	8
Well #06	Pit with light soil impact	2	1	1	2
Well #07	Light soil impact	6	3	3	54
Well #10 - nearby area	Pit with crude/water	10	10	2	200
Well #15	Light soil impact	5	5	1	25
Well #22	Soil impact	5	5	2	50
Well #25	Light soil impact	2	1	1	2
Well #29	Light soil impact	5	3	1	15
Well #31	Light soil impact	2	1	1	2
Well #32	Light soil impact	5	5	1	25
Well #34	Light soil impact	3	2	1	6
Well #38	Light soil impact	5	3	1	15
Well #39	Light soil impact	20	10	1	200
Well #40	Light soil impact	3	2	1	6
Well #45	Light soil impact	2	1	1	2
Well #48	Soil impact near well pad	5	5	2	50
Well #49 - nearby area	Soil impact	10	5	2	100
Well #52	Pit naturally restored				
Well 54	Pit naturally restored				
Well #56	Light soil impact	2	2	1	4
Total Volume Closed by Aeration in Place					6921

Pits Closed by GCL

<i>Location</i>	<i>Description</i>
WE-3	Pit covered by GCL
Well #33	Pit covered by GCL
Well #37	Pit covered by GCL
Well # 43	Pit covered by GCL
Well #47	Pit covered by GCL
Well #48	Pit covered by GCL
Well #51	Pit covered by GCL
Well #54	Pit covered by GCL
Well #55	Pit covered by GCL
Well #57	Pit covered by GCL
Well #59	Pit covered by GCL
Well #60	Pit covered by GCL

TABLE 4: Areas of impacted soil remediated in the treatment cells.

Location	Description	Length (ft)	Width (ft)	Depth (ft)	Total Volume	Disposition
Tank Battery Cell	Large area of surface crude spills, paraffin pits and tank leakage	NA	NA	20-30	NA	Created in-situ soil cell A
Paraffin pit north of Pond A	Soil impact	10	10	6	600	Transported to soil cell B
Near Tank Battery	Soil impact	10	10	10	1000	Incorporated into soil cell A
Well 47	Paraffin pit filled with 1' of H2O/oil & 1' of sludge	20	15	10	3000	Created in-situ soil cell B
Paraffin pit near Tank Battery	Paraffin pit	15	30	10	4500	Incorporated into soil cell B

Table 5: GCL NORM Survey

Background Measurements	
Location	Gamma Exposure (mR/hr)
Road south of larger tank in operations yard	10
Near Headache Creek, in trees south of yard	10 - 12
Road south of yard, between yard and Headache Creek bridge	10 - 11
Road south of Headache Creek, at fork in road	10 - 11
Road east of old saw mill, west of yard	10 - 12
East of bridge over Navajo River, north of yard	9 - 10
On road following power line, 1-2 miles south of yard	10 - 12
Mean Background	10.5
Pond Area	
Location	Gamma Exposure (mR/hr)
Pond C, inlet area at edge of water (southeast corner of pond)	22
Pond C, inlet area at high water mark	14
Pond C, inlet area, top of berm	11
Pond C, ~75' southwest of inlet at edge of water	24
Pond C, ~75' southwest of inlet at high water mark	14
Pond C, ~75' southwest of inlet at top of berm	11
Pond C, west side at edge of water	17
Pond C, west side at high water mark	14
Pond C, west side at top of berm	12
Pond C, north side at edge of water	23
Pond C, north side at high water mark	12
Pond C, north side at top of berm	12
Overflow channel from Pond C to Pond D, 10' from overflow pipe	32
Overflow channel from Pond C to Pond D, 50' down channel	20
Overflow channel from Pond C to Pond D, at inlet of Pond D	25
Pond D, bottom	48
Channel from Pond C to Pond B	47
Pond B, southwest corner at edge of water	27
Pond B, northwest corner at edge of water	24
Pond B, southeast (inlet) corner at edge of water	60
Pond B, ~ 40' along channel from inlet	70
Pond A, southeast corner (inlet) at edge of water	26
Pond A, east side at edge of water	18
Pond A, north side at edge of water	25
Pond E, northeast corner on berm	11
Pond E, east side inlet channel	38
Pond E, north side bottom	33
Pond F northeast corner at edge of water	16
On sandbar at edge of Navajo River	10

Table 4: Laboratory Analyses for Pond Samples

<i>Location</i>	<i>Sample Date</i>	<i>Matrix</i>	<i>Ra-226 (pCi/g)</i>
Shale Outcropping	07/09/1997	Soil	<2.22
Pond Background (between C & D)	07/02/1997	Soil	2.26
Channel Between Ponds A & B	06/24/1997	Soil	70.78
Pond B (sideslope)	06/24/1997	Soil	75.82
Pond B (water)	08/08/1997	Liquid	1.19 pCi/l
Pond C (water)	08/08/1997	Liquid	1.81 pCi/l

Table 2: Radium 226 Concentrations of Tank BS&W
and Evaporation Pond water

<i>Location</i>	<i>Sample Date</i>	<i>Matrix</i>	<i>Ra-226 (pCi/g)</i>	<i>Ra 228 (pCi/l)</i>
BS&W Impoundments				
Pit A South	06/24/1997	Sludge	53.51	
Pit A North	06/24/1997	Sludge	47.25	
Pit A North (top layer south)	07/09/1997	Sludge	<1.29	
Pit A North (top layer central)	07/09/1997	Sludge	<1.37	
Pit A North (top layer north)	07/09/1997	Sludge	<1.21	
Pit A South Composite	07/02/1997	Sludge	62.89	
Pit A North Composite	07/02/1997	Sludge	42.92	
Pit A North and South Composite	07/18/1997	Sludge	44.38	
Pit B (water)	07/09/1997	Liquid	<32.7 pCi/l*	
Pit B (sludge)	07/09/1997	Sludge	320.95 pCi/l	
BS&W and Clean Soil Mixture				
Lot No. 1	12/28/1997	Soil	18.04	
Lot No. 2	12/28/1997	Soil	8.32	
Lot No. 3	12/29/1997	Soil	17.18	
Lot No. 4	12/29/1997	Soil	3.89	
Evaporation Ponds				
Pond B	Nov-97	Water	1.19	nd
Pond C	11/01/1997	Water	1.81	2.49

* Total Activity is Zero

Table 8: May Field Parameters of Monitor Wells

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TABLE 9: Groundwater Fluid Measurements

Monitoring Well No.	Measurement Date	Ground Elevation (ft)	Casing Elevation (ft)	Depth to Water (ft)	Relative Groundwater Elevation (ft)
MW-1	08/19/1995	96.9	99.4	30.71	68.69
	08/24/1995	96.9	99.4	30.7	68.7
	07/02/1996	96.9	99.4	30.54	68.86
	04/21/1997	96.9	99.4	26.92	72.48
	09/16/1997	96.9	99.4		
	05/22/1998	96.9	99.4		
MW-2	08/19/1995	74.2	76.76	11.15	65.61
	08/24/1995	74.2	76.76	11.32	65.44
	07/02/1996	74.2	76.76	11.46	65.3
	04/21/1997	74.2	76.76	10.67	66.09
	09/16/1997	74.2	76.76		
	05/22/1998	74.2	76.76		
MW-3	08/19/1995	71.4	73.94	9.97	63.97
	08/24/1995	71.4	73.94	10.02	63.92
	07/02/1996	71.4	73.94	10.21	63.73
	04/21/1997	71.4	73.94	9.65	64.29
	09/16/1997	71.4	73.94		
	05/22/1998	71.4	73.94		
MW-4	08/19/1995	107.3	109.81	39.46	70.35
	08/24/1995	107.3	109.81	39.3	70.51
	07/02/1996	107.3	109.81	39.71	70.1
	04/21/1997	107.3	109.81	35.69	75.68*
	09/16/1997	107.3	109.81		
	05/22/1998	107.3	109.81		
MW-5	08/19/1995	96.5	98.97	31.41	67.56
	08/24/1995	96.5	98.97	31.44	67.53
	07/02/1996	96.5	99.1	31.2	67.9
	04/21/1997	96.5	98.97	27.61	62.74
	09/16/1997	96.5	98.97		
	05/22/1998	96.5	98.97		
MW-6	08/19/1995	84.7	87.3	24.75	62.55
	08/24/1995	84.7	87.3	24.58	62.72
	07/02/1996	84.7	87.3	24.41	62.89
	04/21/1997	84.7	87.3	24.56	62.74
	09/16/1997	84.7	87.3		
	05/22/1998	84.7	87.3		
MW-7	08/19/1995	79.2	81.89	21.68	60.21
	08/24/1995	79.2	81.89	21.53	60.36
	07/02/1996	79.2	81.89	22.37	59.52
	04/21/1997	79.2	81.89	21.3	60.59
	09/16/1997	79.2	81.89		
	05/22/1998	79.2	81.89		
MW-9	08/19/1995	76.2	78.2	16.47	61.73
	08/24/1995	76.2	78.2	16.35	61.85
	07/02/1996	76.2	78.2	16.99	61.21
	04/21/1997	76.2	78.2	16.07	62.13
	09/16/1997	76.2	78.2		
	05/22/1998	76.2	78.2		
MW-10	08/19/1995	95.3	97.95	29.77	68.18
	08/24/1995	95.3	97.95	29.8	68.15
	07/02/1996	95.3	97.95	29.82	68.13
	04/21/1997	95.3	97.95	25.74	72.21
	09/16/1997	95.3	97.95		
	05/22/1998	95.3	97.95		
MW-11	08/19/1995	88.7	91.43	25.92	65.51
	08/24/1995	88.7	91.43	26.1	65.33
	07/02/1996	88.7	91.43	26.36	65.07
	04/21/1997	88.7	91.43	24.95	66.48
	09/16/1997	88.7	91.43		
	05/22/1998	88.7	91.43		

* water elevation corrected for 1.25 inches of crude

Table 6: Results of Composite Soil Sample Analyses

Sample Location	Sample Date	TPH (mg/Kg)	Gross Alpha (pCi/l)	Gross Beta (pCi/l)	Ra 226 pCi/g
Cell A	05/23/1998	19,000	10.24	26.69	
Cell B	05/23/1998	65,000	14.07	36.63	
GCL Cell	05/23/1998	300	13.4	34.99	
Pit Closed by Oil Field Personnel	12/29/1997				<1.18