

**C-747-A Burn Area
Solid Waste Management Unit (SWMU) Assessment Report**

SWMU/AOC NUMBER: 30

DATE OF ORIGINAL SAR: 8/24/1987

DATE OF SAR REVISION: 12/18/2009

REGULATORY STATUS: SWMU

LOCATION: The SWMU is bounded on the north and south sides by ditches, on the west side by Patrol Road 1, and on the east side by C-747-A Burial Ground (SWMU 7). SWMU 30 includes the western one-third of C-747-A.

APPROXIMATE DIMENSION OR CAPACITY: Approximately 117,600 ft² and includes two discrete burial areas, Burial Pit A, approximately 12,500 ft², and a smaller pit, approximately 3,200 ft². (See Attached Map).

FUNCTION: This SWMU was used to burn combustible trash and then ash and debris were buried below ground in Burial Pit A.

BRIEF HISTORY: SWMU 30 was used from 1951 to 1970 to burn combustible trash, which may have contained uranium contamination. An incinerator was constructed for use at SWMU 30, but the exact time frame is uncertain. The incinerator was a steel mesh, "tee pee" shaped structure primarily used to burn paper, wood, cardboard, and other combustibles. Ash and debris were buried below ground in Burial Pit A beginning in 1962, when use of an on-site incinerator was discontinued. It is assumed ash from incineration was buried at SWMU 30 rather than taken elsewhere at the site. Site maps and a surface electromagnetic geophysical survey of the Phase II SI identify the location of Burial Pit A. Prior to identification by Phase II SI surface geophysics testing; it was believed that remnants of the former incinerator were not present. Further research identified images of the incinerator at the location. This disposal site covers an area of about 250 ft by 50 ft. Geophysical data from the Phase II SI indicate that the actual area of excavation does not exactly match the rectangular outline and extends beyond the rectangular outline to the north and east. Material disposed in Pit A included contaminated and uncontaminated trash, ash, and debris.

In addition to Pit A, the Phase II SI geophysical investigation also identified another anomaly in the shape of a rough circle approximately 43 ft in diameter (see Section 2). The SWMUs 7 and 30 RI confirmed this anomaly likely was the metal reinforcement within the footer and retaining walls of the former incinerator and/or parts of the unit buried there upon decommissioning (DOE 1998c).

PRESENT OPERATIONAL STATUS: Inactive

DATES OPERATED: SWMU 30 was in operation from 1951 to 1970.

SITE/PROCESS DESCRIPTION: This SWMU consists of a historical burn-and-burial pit (Burial Pit A) and the location of a former incinerator.

WASTE DESCRIPTION: No waste is currently present aboveground. Below ground waste includes contaminated and uncontaminated burned trash, ash, and debris in Pit A and incinerator remnants in a smaller pit.

WASTE QUANTITY: Unknown

SUMMARY OF ENVIRONMENTAL SAMPLING DATA: See attached tables

DESCRIPTION OF RELEASE AND MEDIA AFFECTED:

GROUNDWATER:	See Summary of Environmental Sampling Data above
SURFACE WATER:	See Documentation of No Release below
SOIL:	See Summary of Environmental Sampling Data above
ECOLOGY AFFECTED (i.e., endanger/threatened species):	None known

DOCUMENTATION OF NO RELEASE: Based on the environmental sampling data releases of volatiles, metals, semivolatiles, PCBs, and radionuclides from SWMU 30 to soil and groundwater likely have occurred.

IMPACT ON OR BY OTHER SWMU OR AOC: SWMU 7 (C-747-A Burial Ground)

PRG COMPARISON: See attached tables

RFI NECESSARY: Yes. This is to be completed under the Burial Grounds Operable Unit.

OPERABLE UNIT ASSIGNMENT: Burial Grounds Operable Unit



C-747-A Burial Ground Looking from West to East

November 22, 2005

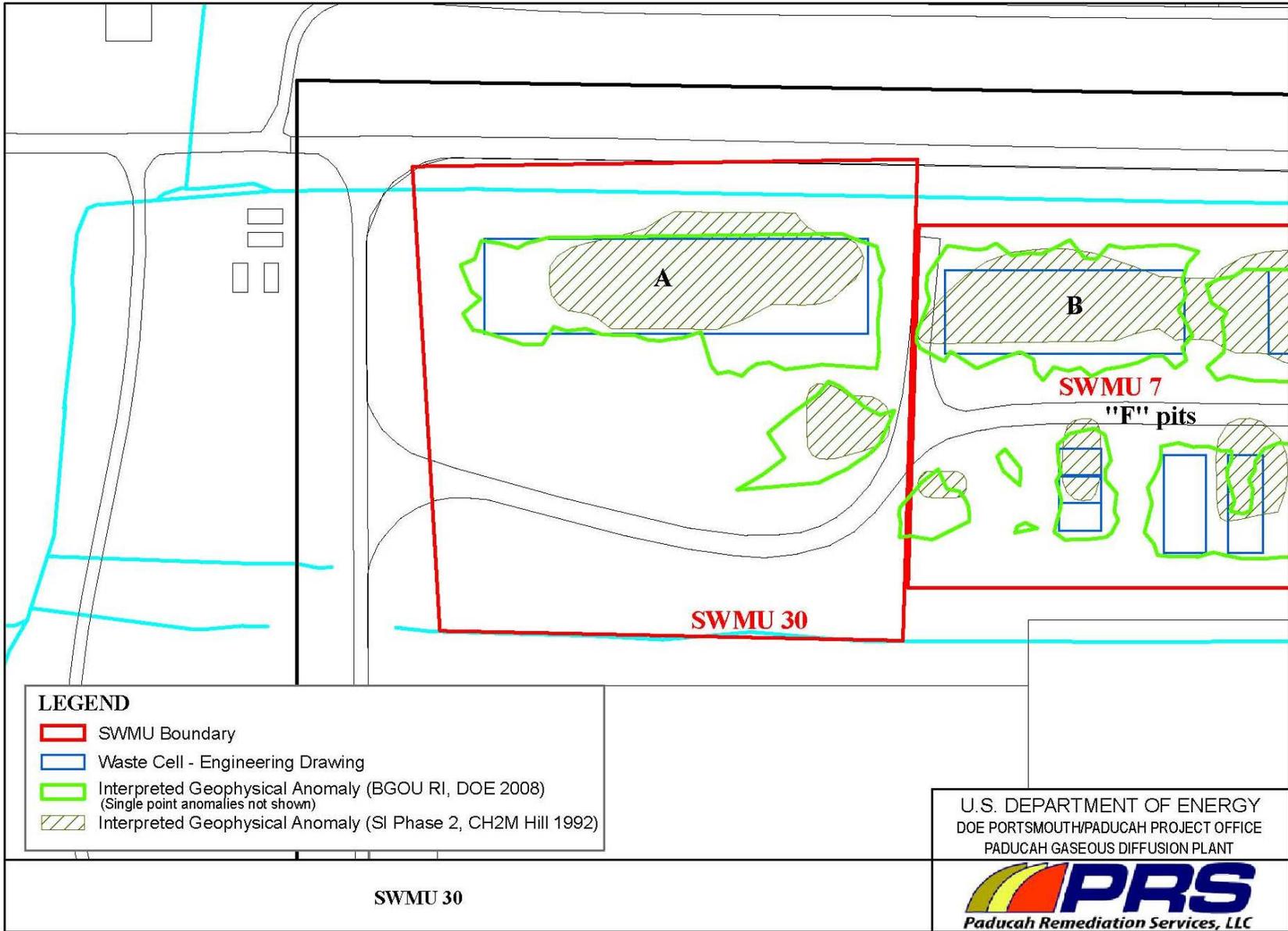


Figure No. bgou\swmu30_sarR1.mxd
DATE 12-21-09

SUMMARY OF ENVIRONMENTAL SAMPLING DATA

Surface Soil Summary

Analysis	Maximum Result	Frequency of Detection ^a	Frequency of Detection		Reference Values	
			Above Background Value	Above Excavation Worker NAL	Background Value	Excavation Worker NAL
<i>Inorganics (mg/kg)</i>						
Aluminum	16,000	8/8	3/8	8/8	13,000	5,250
Antimony	3	8/10	8/10	6/10	0.21	0.492
Arsenic	8.9	8/10	0/10	8/10	12	0.324
Beryllium	0.85	8/8	3/8	0/8	0.67	1.26
Cadmium	2.8	6/10	3/10	0/10	0.21	15.2
Chromium	45.7	10/10	10/10	0/10	16	476
Copper	170	8/8	5/8	0/8	19	427
Iron	24,000	8/8	0/8	8/8	28,000	2,170
Lead	71	8/10	3/10	2/10	36	50
Manganese	490	8/8	0/8	8/8	1,500	56.6
Nickel	570	10/10	5/10	2/10	21	216
Thallium	1.8	5/10	5/10	4/10	0.21	0.711
Uranium	1,400	5/8	5/8	5/8	4.9	11.3
Vanadium	34	8/8	0/8	8/8	38	4.4
Zinc	750	8/8	4/8	0/8	65	2,660
<i>Organics--Semivolatiles (mg/kg)</i>						
Benz(a)anthracene	9.1	7/8	N/A	5/8	N/A	0.232
Benzo(a)pyrene	8.4	6/8	N/A	6/8	N/A	0.0232
Benzo(b)fluoranthene	9.6	6/8	N/A	5/8	N/A	0.232
Benzo(k)fluoranthene	4.3	6/8	N/A	1/8	N/A	2.32
Dibenz(a,h)anthracene	1.6	5/8	N/A	5/8	N/A	0.0232
Indeno(1,2,3-cd)pyrene	5.4	6/8	N/A	5/8	N/A	0.232
<i>Organics--PCBs (mg/kg)</i>						
PCB, Total	15	10/10	N/A	8/10	N/A	0.168
PCB-1254	0.2	2/10	N/A	2/10	N/A	0.168
PCB-1260	15	8/8	N/A	6/8	N/A	0.168
<i>Radionuclides(pCi/g)</i>						
Neptunium-237	1.68	8/8	6/8	3/8	0.1	0.328
Plutonium-239	0.62	7/8	7/8	0/8	0.025	1.63
Technetium-99	360	8/8	3/8	2/8	2.5	57.9
Thorium-230	4.88	8/8	5/8	2/8	1.5	2.22
Uranium-234	115	8/8	8/8	8/8	2.5	2.84
Uranium-235/236	16.6	8/8	8/8	7/8	0.14	0.455
Uranium-238	565	8/8	8/8	8/8	1.2	1.17

^a Frequency of detection is the number of detections of an analyte per number of analyses (includes regular and duplicate samples).

N/A = not applicable

NAL = no action level

Reference values for background and NAL taken from *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, Volume 1. Human Health DOE/OR/07-1506&D2 Paducah, Kentucky 2001*. Background values are provisional background concentrations. NALs are for the excavation worker scenario.

Subsurface Soil Summary

Analysis	Maximum Result	Frequency of Detection ^a	Frequency of Detection		Reference Values	
			Above Background Value	Above Excavation Worker NAL	Background Value	Excavation Worker NAL
<i>Inorganics (mg/kg)</i>						
Aluminum	19,000	25/25	1/25	22/25	12,000	5,250
Arsenic	4.03	18/25	0/25	18/25	7.9	0.324
Beryllium	1.48	7/25	5/25	2/25	0.69	1.26
Calcium	11,000	25/25	2/25	N/A	6,100	N/A
Chromium	49	25/25	1/25	0/25	43	476
Cobalt	14	17/25	1/25	0/25	13	1,110
Copper	35	24/25	2/25	0/25	25	427
Iron	29,000	25/25	1/25	25/25	28,000	2,170
Manganese	1,200	25/25	1/25	18/25	820	56.6
Nickel	32	21/25	2/25	0/25	22	216
Selenium	1	3/25	1/25	0/25	0.7	71.3
Vanadium	40	24/25	1/25	17/25	37	4.4
Zinc	67	16/25	1/25	0/25	60	2,660
<i>Organics--Semivolatiles (mg/kg)</i>						
Benzo(a)pyrene	0.052	1/26	N/A	2/26	N/A	0.0232
<i>Organics--PCBs (mg/kg)</i>						
PCB, Total	0.18	5/26	N/A	1/26	N/A	0.168
PCB-1260	0.18	4/26	N/A	1/26	N/A	0.168
<i>Radionuclides(pCi/g)</i>						
Technetium-99	6.79	5/26	1/26	0/26	2.8	57.9
Thorium-228	0.617	21/21	0/21	21/21	1.6	0.0357
Thorium-230	1.44	17/26	3/26	0/26	1.4	2.22
Uranium-234	20.6	19/28	5/28	4/28	2.4	2.84
Uranium-235/236	0.55	5/5	3/5	1/5	0.14	0.455
Uranium-238	37.4	16/28	6/28	6/28	1.2	1.17

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UCRS Groundwater Summary

Analysis	Maximum Detection	Frequency of Detection ^a	Frequency of Detection			Reference Values		
			Above Background	Above NAL	Above MCL	Background	NAL	MCL
Metals (mg/L)								
Aluminum	53	4/4	N/A	3/4	N/A	N/A	1.49	N/A
Antimony	0.0053	2/4	N/A	2/4	0/4	N/A	0.000564	0.006
Arsenic	0.067	2/4	N/A	2/4	2/4	N/A	0.000035	0.01
Barium	0.52	4/4	N/A	4/4	0/4	N/A	0.104	2
Barium, Dissolved	N/A	1/1	N/A	1/1	0/1	N/A	0.104	2
Cadmium	0.011	1/4	N/A	1/4	1/4	N/A	0.000661	0.005
Copper	0.39	3/4	N/A	2/4	0/4	N/A	0.0557	1.3
Iron	51	4/4	N/A	4/4	N/A	N/A	0.449	N/A
Iron, Dissolved	N/A	1/1	N/A	1/1	N/A	N/A	0.449	N/A
Lead	0.23	3/4	N/A	2/4	2/4	N/A	0.015	0.015
Manganese	0.97	4/4	N/A	3/4	N/A	N/A	0.035	N/A
Manganese, Dissolved	N/A	1/1	N/A	1/1	N/A	N/A	0.035	N/A
Mercury	0.0007	3/3	N/A	2/3	0/3	N/A	0.000444	0.002
Molybdenum	0.14	2/4	N/A	2/4	N/A	N/A	0.00753	N/A
Molybdenum, Dissolved	N/A	1/1	N/A	1/1	N/A	N/A	0.00753	N/A
Nickel	0.14	3/4	N/A	3/4	N/A	N/A	0.0301	N/A
Nickel, Dissolved	N/A	1/1	N/A	1/1	N/A	N/A	0.0301	N/A
Selenium	0.0087	1/4	N/A	1/4	0/4	N/A	0.00754	0.05
Uranium	0.17	3/6	N/A	3/6	3/6	N/A	0.000906	0.03
Uranium, Dissolved	N/A	1/1	N/A	1/1	1/1	N/A	0.000906	0.03
Vanadium	0.095	2/4	N/A	2/4	N/A	N/A	0.00925	N/A
Radionuclides (pCi/L)								
Neptunium-237	5.57	2/4	N/A	2/4	N/A	N/A	0.573	N/A
Plutonium-239	4.21	3/3	N/A	2/3	N/A	N/A	0.286	N/A
Technetium-99	402	3/4	N/A	2/4	0/4	N/A	14	900
Thorium-230	11.7	3/4	N/A	3/4	N/A	N/A	0.424	N/A
Uranium-234	2,220	5/5	N/A	5/5	N/A	N/A	0.546	N/A
Uranium-238	2710	5/5	N/A	4/5	N/A	N/A	0.443	N/A
Uranium-234, Dissolved	N/A	1/1	N/A	1/1	N/A	N/A	0.546	N/A
Uranium-235, Dissolved	N/A	1/1	N/A	1/1	N/A	N/A	0.538	N/A
Uranium-238, Dissolved	N/A	1/1	N/A	1/1	N/A	N/A	0.443	N/A
PCBs (mg/L)								
PCB-1260	0.0029	1/3	N/A	1/3	1/3	N/A	0.0000428	0.0005
Semivolatiles (mg/L)								
1,3-Dichlorobenzene	0.021	4/8	N/A	4/8	N/A	N/A	0.000241	N/A
1,4-Dichlorobenzene	0.067	4/8	N/A	4/8	0/8	N/A	0.000578	0.075
2,4-Dimethylphenol	0.064	2/4	N/A	1/4	N/A	N/A	0.023	N/A
Di-n-octylphthalate	0.0018	1/4	N/A	1/4	N/A	N/A	0.000684	N/A
Naphthalene	0.00072	1/4	N/A	1/4	N/A	N/A	0.000285	N/A
Volatiles (mg/L)								
1,1-Dichloroethane	0.072	2/5	N/A	1/5	N/A	N/A	0.0363	N/A
1,2-Dichloroethane	0.003	2/5	N/A	2/5	0/5	N/A	0.000147	0.005

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Secondary Document**

Analysis	Maximum Detection	Frequency of Detection ^a	Frequency of Detection			Reference Values		
			Above Background	Above NAL	Above MCL	Background	NAL	MCL
Benzene	0.0054	2/5	N/A	2/5	1/5	N/A	0.000385	0.005
Chlorobenzene	0.093	2/5	N/A	2/5	0/5	N/A	0.00466	0.1
Chloroethane	0.12	2/5	N/A	2/5	N/A	N/A	0.00461	N/A
Chloromethane	0.0094	1/5	N/A	1/5	N/A	N/A	0.00167	N/A
cis-1,2-Dichloroethene	0.067	3/5	N/A	2/5	0/5	N/A	0.00273	0.07
Ethylbenzene	0.011	1/5	N/A	1/5	0/5	N/A	0.00468	0.7
Trichloroethene	0.45	4/6	N/A	4/6	2/6	N/A	0.0016	0.005
Vinyl chloride	0.0086	2/5	N/A	2/5	2/5	N/A	0.000035	0.002

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Reference values for background and NAL taken from *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, Volume 1. Human Health* DOE/OR/07-1506&D2 Paducah, Kentucky 2001. Background values are provisional background concentrations over all observations. NALs are for the child resident scenario.

MCLs are taken from *Remedial Investigation Report for the Burial Grounds Operable Unit at the Paducah Gaseous Diffusion Plant Paducah, Kentucky*, DOE/LX/07-0030&D1/R1 Paducah, Kentucky 2009

RGAs Groundwater Summary

Analysis	Maximum Detection	Frequency of Detection ^a	Frequency of Detection			Reference Values		
			Above Background	Above NAL	Above MCL	Background	NAL	MCL
Metals (mg/L)								
Aluminum	143	58/71	38/71	45/71	N/A	2.189	1.49	N/A
Aluminum, Dissolved	3.94	18/66	17/66	3/66	N/A	0.311	1.49	N/A
Arsenic	0.0123	1/4	1/4	1/4	1/4	0.005	0.000035	0.01
Arsenic, Dissolved	0.00815	1/1	1/1	1/1	0/1	0.005	0.000035	0.01
Barium	1.47	19/23	2/23	13/23	0/23	0.235	0.104	2
Barium, Dissolved	1.06	16/20	2/20	12/20	0/20	0.2	0.104	2
Cadmium	0.00224	1/20	0/20	1/20	0/20	0.01	0.000661	0.005
Calcium	85	80/80	2/80	N/A	N/A	41.238	N/A	N/A
Calcium, Dissolved	78.2	76/76	2/76	N/A	N/A	38.166	N/A	N/A
Chromium	0.5	7/23	3/23	0/23	5/23	0.144	1.76	0.1
Cobalt	0.334	3/23	2/23	1/23	N/A	0.045	0.0906	N/A
Cobalt, Dissolved	0.311	2/11	2/11	1/11	N/A	0.045	0.0906	N/A
Iron	226	66/79	28/79	61/79	N/A	5.03	0.449	N/A
Iron, Dissolved	54.6	25/76	24/76	16/76	N/A	0.267	0.449	N/A
Lead	0.432	3/7	1/7	1/7	1/7	0.129	0.015	0.015
Magnesium	29.6	80/80	3/80	0/80	N/A	16.262	N/A	N/A
Magnesium, Dissolved	25.8	76/76	1/76	0/76	N/A	16.215	N/A	N/A
Manganese	39.9	64/79	56/79	58/79	N/A	0.119	0.035	N/A
Manganese, Dissolved	38.2	57/76	56/76	57/76	N/A	0.068	0.035	N/A
Nickel	0.47	10/23	0/23	8/23	N/A	0.682	0.0301	N/A
Nickel, Dissolved	0.203	6/10	0/10	6/10	N/A	0.305	0.0301	N/A
Potassium	7.72	11/76	1/76	N/A	N/A	5.195	N/A	N/A
Sodium	162	80/80	8/80	0/80	N/A	59.45	N/A	N/A
Sodium, Dissolved	150	76/76	7/76	0/76	N/A	60.433	N/A	N/A
Uranium	0.19	4/128	2/128	4/128	2/128	0.002	0.000906	0.03
Vanadium	0.064	3/5	0/5	1/5	N/A	0.134	0.00925	N/A

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Analysis	Maximum Detection	Frequency of Detection ^a	Frequency of Detection			Reference Values		
			Above Background	Above NAL	Above MCL	Background	NAL	MCL
Vanadium, Dissolved	0.071	2/2	0/2	2/2	N/A	0.134	0.00925	N/A
Radionuclides (pCi/L)								
Radium-226	0.52	2/8	0/8	2/8	0/8	0.6	0.1	5
Radon-222	632	43/44	1/44	43/44	N/A	626	0.866	N/A
Technetium-99	2,911	210/279	175/279	194/279	39/279	22.3	14	900
Thorium-230	0.79	4/33	0/33	4/33	N/A	1.1	0.424	N/A
Uranium-234	448	4/11	1/11	2/11	N/A	0.7	0.546	N/A
Uranium-238	441	1/14	1/14	1/14	N/A	0.7	0.443	N/A
Volatiles (mg/L)								
Chloroform	0.001	1/41	N/A	1/41	N/A	N/A	0.0000287	N/A
cis-1,2-Dichloroethene	0.0226	5/237	N/A	4/237	0/237	N/A	0.00273	0.07
Tetrachloroethene	0.32	1/193	N/A	1/193	1/193	N/A	0.000582	0.005
Trichloroethene	15	252/277	N/A	250/277	232/277	N/A	0.0016	0.005

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