Z AREA MIDYEAR GROUNDWATER MONITORING REPORT FOR 2010

SRNS-TR-2010-00193

JULY 2010

Discussion and Results

The groundwater monitoring results for the Z Area Disposal Facility's first sampling event of 2010 are shown in table 1. The results are sorted by laboratory qualifier. Field measurements and laboratory results exceeding the practical quantitation limit (PQL) were not assigned qualifiers and appear at the bottom of the table.

The following constituents were above the PQL:
-bismuth 214
-lead 214
-nitrate-nitrite as nitrogen
-tritium

The bismuth 214 and lead 214 detections appear to be of natural origins. Nitrate occurs naturally, and all downgradient results were less than the background result from well ZBG 1. The tritium results are not unusual for Z Area wells.

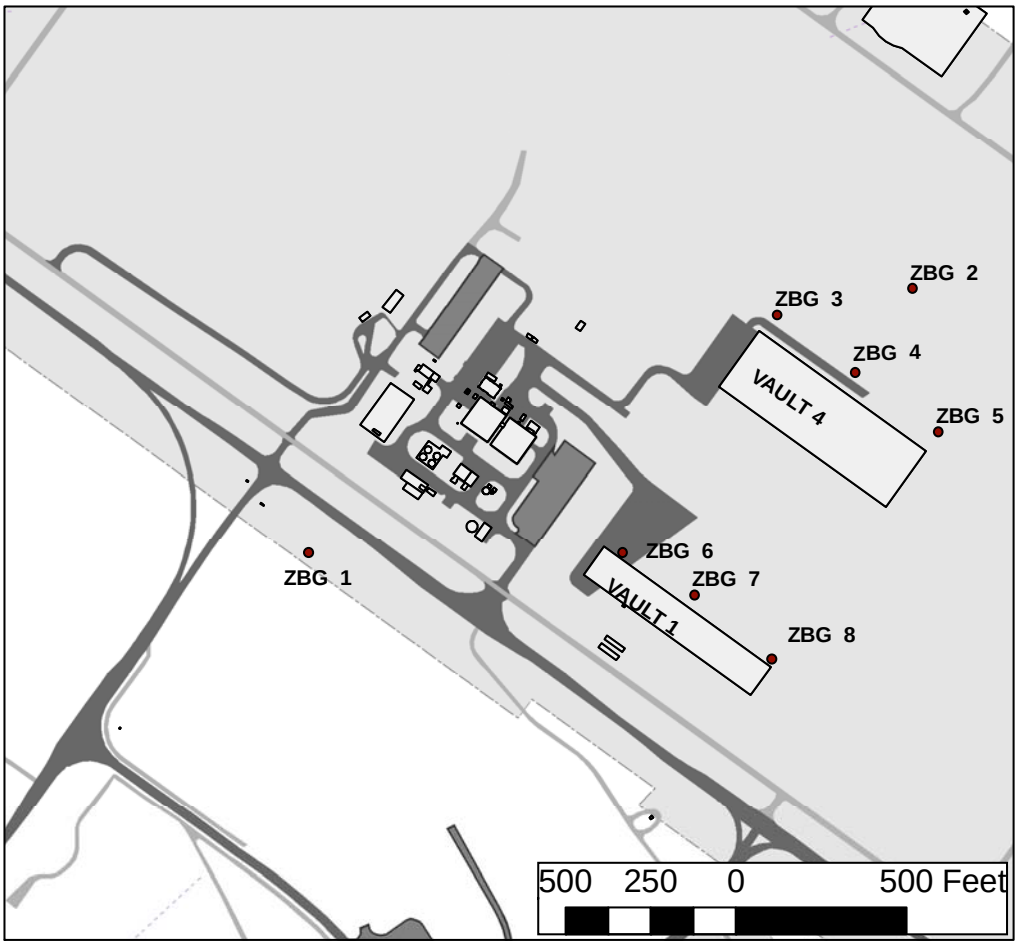

Figure 1. Locations of Z Area wells.

Table 1. Groundwater monitoring results for the first sampling event of 2010.

WELL	DATE	ANALYTE_NAME	METHOD	MDL	PQL	LAB_QUALIFIER	RESULT	UNITS
ZBG 1	4/26/10	ACTINIUM-228	L3.21-10021	40.8	101	U	32.4	pCi/L
ZBG 2	4/26/10	ACTINIUM-228	L3.21-10021	41	87.5	U	-2.82	pCi/L
ZBG 3	4/26/10	ACTINIUM-228	L3.21-10021	37.4	78.1	U	3.47	pCi/L
ZBG 4	4/26/10	ACTINIUM-228	L3.21-10021	40.8	82.6	U	21.5	pCi/L
ZBG 4	4/26/10	ACTINIUM-228	L3.21-10021	37.2	78.8	U	-2.37	pCi/L
ZBG 1	4/26/10	AMERICIUM-241	L3.21-10005	82.5	179	U	3.21	pCi/L
ZBG 2	4/26/10	AMERICIUM-241	L3.21-10005	93	204	U	-17.4	pCi/L
ZBG 3	4/26/10	AMERICIUM-241	L3.21-10005	83.7	184	U	-18.4	pCi/L
ZBG 4	4/26/10	AMERICIUM-241	L3.21-10005	83.6	182	U	-2.08	pCi/L
ZBG 4	4/26/10	AMERICIUM-241	L3.21-10005	78.8	172	U	-4.56	pCi/L
ZBG 1	4/26/10	ANTIMONY-125	L3.21-10021	25.6	56.5	U	-4.39	pCi/L
ZBG 2	4/26/10	ANTIMONY-125	L3.21-10021	27.2	59.6	U	-1.71	pCi/L
ZBG 3	4/26/10	ANTIMONY-125	L3.21-10021	23.7	53.9	U	-15.5	pCi/L
ZBG 4	4/26/10	ANTIMONY-125	L3.21-10021	25.6	54.5	U	8.22	pCi/L
ZBG 4	4/26/10	ANTIMONY-125	L3.21-10021	22.1	47.5	U	3.04	pCi/L
ZBG 1	4/26/10	BARIUM-133	L3.21-10021	10.8	25.1	U	0.67	pCi/L
ZBG 2	4/26/10	BARIUM-133	L3.21-10021	12.4	28.6	U	2.69	pCi/L
ZBG 3	4/26/10	BARIUM-133	L3.21-10021	12.5	29.6	U	-1.97	pCi/L
ZBG 4	4/26/10	BARIUM-133	L3.21-10021	11.6	28.4	U	-6.07	pCi/L
ZBG 4	4/26/10	BARIUM-133	L3.21-10021	11.3	27.4	U	-5.09	pCi/L
ZBG 1	4/26/10	CESIUM-134	L3.21-10021	8.88	20	U	2.09	pCi/L
ZBG 2	4/26/10	CESIUM-134	L3.21-10021	9.21	20.2	U	4.65	pCi/L
ZBG 3	4/26/10	CESIUM-134	L3.21-10021	8.22	20	U	-4.83	pCi/L
ZBG 4	4/26/10	CESIUM-134	L3.21-10021	8.94	20.2	U	4.09	pCi/L
ZBG 4	4/26/10	CESIUM-134	L3.21-10021	8.75	19.6	U	2.22	pCi/L
ZBG 1	4/26/10	CESIUM-137	L3.21-10021	9.03	18.9	U	1.43	pCi/L
ZBG 2	4/26/10	CESIUM-137	L3.21-10021	8.43	19.2	U	-7.14	pCi/L
ZBG 3	4/26/10	CESIUM-137	L3.21-10021	9.23	20.4	U	-4.21	pCi/L
ZBG 4	4/26/10	CESIUM-137	L3.21-10021	8.37	18.4	U	-3.22	pCi/L
ZBG 4	4/26/10	CESIUM-137	L3.21-10021	8.84	19.2	U	-2.54	pCi/L
ZBG 1	4/26/10	COBALT-60	L3.21-10021	7.86	15.8	U	1.27	pCi/L
ZBG 2	4/26/10	COBALT-60	L3.21-10021	8.37	18.2	U	-3.15	pCi/L
ZBG 3	4/26/10	COBALT-60	L3.21-10021	8.4	18.3	U	-3.1	pCi/L
ZBG 4	4/26/10	COBALT-60	L3.21-10021	10	19.8	U	5.16	pCi/L
ZBG 4	4/26/10	COBALT-60	L3.21-10021	8.46	17	U	1.84	pCi/L
ZBG 1	4/26/10	EUROPIUM-152	L3.21-10021	24.6	55.3	U	-9.19	pCi/L

WELL	DATE	ANALYTE_NAME	METHOD	MDL	PQL	LAB_QUALIFIER	RESULT	UNITS
ZBG 2	4/26/10	EUROPIUM-152	L3.21-10021	28.7	63.8	U	-0.466	pCi/L
ZBG 3	4/26/10	EUROPIUM-152	L3.21-10021	27	59.6	U	3.71	pCi/L
ZBG 4	4/26/10	EUROPIUM-152	L3.21-10021	25.9	58.9	U	-16	pCi/L
ZBG 4	4/26/10	EUROPIUM-152	L3.21-10021	25.7	56	U	10.1	pCi/L
ZBG 1	4/26/10	EUROPIUM-154	L3.21-10021	17.8	39.3	U	2.12	pCi/L
ZBG 2	4/26/10	EUROPIUM-154	L3.21-10021	20.3	44.4	U	8.78	pCi/L
ZBG 3	4/26/10	EUROPIUM-154	L3.21-10021	19	42.2	U	-1.35	pCi/L
ZBG 4	4/26/10	EUROPIUM-154	L3.21-10021	18.4	40.9	U	-1.31	pCi/L
ZBG 4	4/26/10	EUROPIUM-154	L3.21-10021	17.7	39.7	U	-3.88	pCi/L
ZBG 1	4/26/10	EUROPIUM-155	L3.21-10021	31.1	68.7	U	-4.14	pCi/L
ZBG 3	4/26/10	EUROPIUM-155	L3.21-10021	37.1	80.9	U	11.2	pCi/L
ZBG 4	4/26/10	EUROPIUM-155	L3.21-10021	35.9	77.9	U	17	pCi/L
ZBG 4	4/26/10	EUROPIUM-155	L3.21-10021	31.5	70.2	U	-9.41	pCi/L
ZBG 1	4/26/10	GROSS ALPHA	L3.21-10008	2.44	4.3	U	0.145	pCi/L
ZBG 2	4/26/10	GROSS ALPHA	L3.21-10008	2.44	6.5	U	1.95	pCi/L
ZBG 3	4/26/10	GROSS ALPHA	L3.21-10008	2.44	2.9	U	-0.304	pCi/L
ZBG 5	4/26/10	GROSS ALPHA	L3.21-10008	2.54	5.83	U	1.09	pCi/L
ZBG 7	3/1/10	GROSS ALPHA	L3.21-10008	2.55	3.33	U	-0.387	pCi/L
ZBG 8	3/1/10	GROSS ALPHA	L3.21-10008	2.56	5.72	U	0.939	pCi/L
ZBG 1	4/26/10	IODINE-129	L3.21-10021	0.544	1.18	U	-0.0993	pCi/L
ZBG 2	4/26/10	IODINE-129	L3.21-10021	0.561	1.27	U	-0.21	pCi/L
ZBG 2	4/26/10	IODINE-129	L3.21-10021	0.559	1.18	U	0.179	pCi/L
ZBG 3	4/26/10	IODINE-129	L3.21-10021	0.562	1.2	U	0.0684	pCi/L
ZBG 4	4/26/10	IODINE-129	L3.21-10021	0.568	1.25	U	0.187	pCi/L
ZBG 5	4/26/10	IODINE-129	L3.21-10021	0.551	1.33	U	-0.0996	pCi/L
ZBG 6	3/1/10	IODINE-129	L3.21-10021	0.742	1.56	U	0.183	pCi/L
ZBG 7	3/1/10	IODINE-129	L3.21-10021	0.757	1.6	U	0.132	pCi/L
ZBG 8	3/1/10	IODINE-129	L3.21-10021	0.79	1.82	U	0.167	pCi/L
ZBG 2	4/26/10	NONVOLATILE BETA	L3.21-10008	4.29	9.18	U	0.862	pCi/L
ZBG 3	4/26/10	NONVOLATILE BETA	L3.21-10008	4.02	8.25	U	0.0798	pCi/L
ZBG 4	4/26/10	NONVOLATILE BETA	L3.21-10008	4.4	9.82	U	1.94	pCi/L
ZBG 5	4/26/10	NONVOLATILE BETA	L3.21-10008	4.2	9.38	U	1.84	pCi/L
ZBG 6	3/1/10	NONVOLATILE BETA	L3.21-10008	4.7	10.1	U	0.538	pCi/L
ZBG 7	3/1/10	NONVOLATILE BETA	L3.21-10008	4.23	9.84	U	2.47	pCi/L
ZBG 8	3/1/10	NONVOLATILE BETA	L3.21-10008	4.39	9.78	U	1.41	pCi/L
ZBG 1	4/26/10	POTASSIUM-40	L3.21-10021	194	384	U	13.9	pCi/L
ZBG 2	4/26/10	POTASSIUM-40	L3.21-10021	177	356	U	-28.4	pCi/L
ZBG 3	4/26/10	POTASSIUM-40	L3.21-10021	191	378	U	-2.21	pCi/L
ZBG 4	4/26/10	POTASSIUM-40	L3.21-10021	186	367	U	-7.95	pCi/L
ZBG 4	4/26/10	POTASSIUM-40	L3.21-10021	175	344	U	-22.1	pCi/L
ZBG 1	4/26/10	PROMETHIUM-146	L3.21-10021	10.9	23.9	U	-0.979	pCi/L
ZBG 2	4/26/10	PROMETHIUM-146	L3.21-10021	12.7	27.2	U	3.62	pCi/L
ZBG 3	4/26/10	PROMETHIUM-146	L3.21-10021	11.1	25.7	U	1.33	pCi/L
ZBG 4	4/26/10	PROMETHIUM-146	L3.21-10021	11.4	25.4	U	-3.46	pCi/L
ZBG 4	4/26/10	PROMETHIUM-146	L3.21-10021	10.9	23.8	U	-0.867	pCi/L
ZBG 1	4/26/10	SODIUM-22	L3.21-10021	10	19.9	U	3.91	pCi/L
ZBG 2	4/26/10	SODIUM-22	L3.21-10021	9.81	20.9	U	-1.47	pCi/L
ZBG 3	4/26/10	SODIUM-22	L3.21-10021	9.66	20.3	U	-0.392	pCi/L
ZBG 4	4/26/10	SODIUM-22	L3.21-10021	8.37	17.3	U	0.084	pCi/L

WELL	DATE	ANALYTE_NAME	METHOD	MDL	PQL	LAB_QUALIFIER	RESULT	UNITS
ZBG 4	4/26/10	SODIUM-22	L3.21-10021	8.68	18.2	U	-0.362	pCi/L
ZBG 1	4/26/10	THALLIUM-208	L3.21-10021	10.4	22.7	U	-2.22	pCi/L
ZBG 2	4/26/10	THALLIUM-208	L3.21-10021	11	24.6	U	-6.2	pCi/L
ZBG 3	4/26/10	THALLIUM-208	L3.21-10021	11.4	24.6	U	0.944	pCi/L
ZBG 4	4/26/10	THALLIUM-208	L3.21-10021	10.1	22.7	U	-5.57	pCi/L
ZBG 4	4/26/10	THALLIUM-208	L3.21-10021	9.91	22.4	U	-5.24	pCi/L
ZBG 2	4/26/10	EUROPIUM-155	L3.21-10021	40.5	94.6	R	43.7	pCi/L
ZBG 4	4/26/10	GROSS ALPHA	L3.21-10008	2.45	7.27	J	2.87	pCi/L
ZBG 6	3/1/10	GROSS ALPHA	L3.21-10008	2.54	7.88	J	3.56	pCi/L
ZBG 4	4/26/10	LEAD-214	L3.21-10021	19.4	60.6	J	55.1	pCi/L
ZBG 1	4/26/10	NONVOLATILE BETA	L3.21-10008	4.07	10.4	J	5.34	pCi/L
ZBG 1	4/26/10	BISMUTH-214	L3.21-10021	17.3	56.3		83.6	pCi/L
ZBG 2	4/26/10	BISMUTH-214	L3.21-10021	18.7	75		294	pCi/L
ZBG 3	4/26/10	BISMUTH-214	L3.21-10021	17.6	68.5		205	pCi/L
ZBG 4	4/26/10	BISMUTH-214	L3.21-10021	18.1	62		153	pCi/L
ZBG 4	4/26/10	BISMUTH-214	L3.21-10021	16.8	57.4		61.1	pCi/L
ZBG 1	4/26/10	DEPTH_TO_WATER					68	ft
ZBG 1A	4/26/10	DEPTH_TO_WATER					14.2	ft
ZBG 2	4/26/10	DEPTH_TO_WATER					62	ft
ZBG 3	4/26/10	DEPTH_TO_WATER					54	ft
ZBG 4	4/26/10	DEPTH_TO_WATER					56	ft
ZBG 5	4/26/10	DEPTH_TO_WATER					62.1	ft
ZBG 6	3/1/10	DEPTH_TO_WATER						ft
ZBG 7	3/1/10	DEPTH_TO_WATER					81.6	ft
ZBG 8	3/1/10	DEPTH_TO_WATER					57	ft
ZBG 1	4/26/10	LEAD-214	L3.21-10021	18.2	53.1		61.7	pCi/L
ZBG 2	4/26/10	LEAD-214	L3.21-10021	20.8	74.4		273	pCi/L
ZBG 3	4/26/10	LEAD-214	L3.21-10021	19.8	66.5		190	pCi/L
ZBG 4	4/26/10	LEAD-214	L3.21-10021	18.2	59.1		125	pCi/L
ZBG 1	4/26/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.250		1.46	mg/L
ZBG 2	4/26/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.250		0.575	mg/L
ZBG 3	4/26/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.250		0.935	mg/L
ZBG 4	4/26/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.250		0.755	mg/L
ZBG 5	4/26/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.250		0.410	mg/L
ZBG 6	3/1/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.250		0.605	mg/L
ZBG 7	3/1/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.250		1.02	mg/L
ZBG 8	3/1/10	NITRATE-NITRITE AS NITROGEN	EPA 353.2	0.01	0.500		0.803	mg/L
ZBG 1	4/26/10	PH					5.6	pH
ZBG 2	4/26/10	PH					5.8	pH
ZBG 3	4/26/10	PH					5.1	pH
ZBG 4	4/26/10	PH					4.7	pH
ZBG 5	4/26/10	PH					6.2	pH
ZBG 6	3/1/10	PH					4.4	pH
ZBG 7	3/1/10	PH					4.7	pH
ZBG 8	3/1/10	PH					5.3	pH

WELL	DATE	ANALYTE_NAME	METHOD	MDL	PQL	LAB_QUALIFIER	RESULT	UNITS
ZBG 1	4/26/10	SPECIFIC CONDUCTANCE					26	us/cm
ZBG 2	4/26/10	SPECIFIC CONDUCTANCE					19	us/cm
ZBG 3	4/26/10	SPECIFIC CONDUCTANCE					21	us/cm
ZBG 4	4/26/10	SPECIFIC CONDUCTANCE					33	us/cm
ZBG 5	4/26/10	SPECIFIC CONDUCTANCE					106	us/cm
ZBG 6	3/1/10	SPECIFIC CONDUCTANCE					15	us/cm
ZBG 7	3/1/10	SPECIFIC CONDUCTANCE					16	us/cm
ZBG 8	3/1/10	SPECIFIC CONDUCTANCE					18	us/cm
ZBG 1	4/26/10	TRITIUM	L3.21-10015	0.514			2.52	pCi/mL
ZBG 2	4/26/10	TRITIUM	L3.21-10015	0.515			1.74	pCi/mL
ZBG 3	4/26/10	TRITIUM	L3.21-10015	0.513			2.82	pCi/mL
ZBG 4	4/26/10	TRITIUM	L3.21-10015	0.534			1.74	pCi/mL
ZBG 5	4/26/10	TRITIUM	L3.21-10015	0.535			1.22	pCi/mL
ZBG 6	3/1/10	TRITIUM	L3.21-10015	0.525	1.45		3.51	pCi/mL
ZBG 7	3/1/10	TRITIUM	L3.21-10015	0.524	1.43		3.35	pCi/mL
ZBG 8	3/1/10	TRITIUM	L3.21-10015	0.524	1.42		3.19	pCi/mL
ZBG 1	4/26/10	TURBIDITY					2.1	NTU
ZBG 2	4/26/10	TURBIDITY					9.4	NTU
ZBG 3	4/26/10	TURBIDITY					3.3	NTU
ZBG 4	4/26/10	TURBIDITY					5.1	NTU
ZBG 5	4/26/10	TURBIDITY					33	NTU
ZBG 6	3/1/10	TURBIDITY					0.9	NTU
ZBG 7	3/1/10	TURBIDITY					2.5	NTU
ZBG 8	3/1/10	TURBIDITY					6	NTU
ZBG 1	4/26/10	WATER TEMPERATURE					23.7	degC
ZBG 2	4/26/10	WATER TEMPERATURE					27.6	degC
ZBG 3	4/26/10	WATER TEMPERATURE					22.6	degC
ZBG 4	4/26/10	WATER TEMPERATURE					22.5	degC
ZBG 5	4/26/10	WATER TEMPERATURE					22.7	degC
ZBG 6	3/1/10	WATER TEMPERATURE					20	degC
ZBG 7	3/1/10	WATER TEMPERATURE					20.2	degC
ZBG 8	3/1/10	WATER TEMPERATURE					19.7	degC

Definitions:

MDL — method detection limit

PQL — practical quantitation limit

LAB QUALIFIER — USEPA Functional Guideline Codes applied by labs.

USEPA Functional Guideline Codes

J	The detected analyte was positively identified but the result is approximate.
NJ	The detected analyte was only tentatively identified and the result is approximate. All usable TIC results receive this code.
U	The analyte was analyzed for, but not detected. The sample detection and quantitation limits (MDL & SQL) are valid unless blank contamination is indicated.
UJ	The analyte was analyzed for, but not detected. The MDL & SQL are approximate, and may be inaccurate or imprecise.
R	The sample result is rejected as unusable due to serious deficiencies in meeting quality control criteria. The analyte may be present or absent.