

Quarterly Report of Analytical Results for the CEMP Air Sampling Network

The CEMP air-sampling network is designed to monitor and collect radioactive airborne particles from NTS and non-NTS related activities, as well as background environmental sources. This report is provided to the station managers as a summary of the results from the analysis of the air samples they have collected as part of the community environmental monitoring program.

In general, the CEMP air-sampling network is comprised of 29 continuously operating environmental sampling stations. A total of 27 stations are equipped with a low volume air sampler/totalizer configuration to collect particulate radionuclides on glass fiber filter paper. Ideally, the samples are collected on a weekly basis with a target collection time of 168 hours (one week). The samplers are calibrated on a monthly basis by DRI to maintain a collection rate of 2.0 cfm (@ STP). All relevant information such as collection times, variations in flow rate, actual flow volumes, power outages, and other information documenting the integrity of the sample are recorded by the station managers. This allows for the proper interpretation of the analytical results. The air filters are analyzed by a commercial laboratory for gross alpha/beta activity as well as by high-resolution gamma spectrometry. The filters are composited on a quarterly basis (13 weeks) for gamma spectroscopy analysis only after the gross alpha/beta analyses have been completed.

The principle reporting unit used in the U.S. for the measurement of radioactivity in the atmospheric environment is pCi/m^3 (picocuries per cubic meter). DRI receives its data from the lab as microcuries per filter, which is then recalculated to microcuries per milliliter based on the information provided by the station managers as well as monthly calibration results. This is the notation used for DRI internal databases and annual reports to DOE/NNSA. For the ease in constructing the tables contained in this report, as well as to hopefully the ease of comparison among stations and previous results, the units of pCi/m^3 are used. The data for the environmental TLD is reported in milliroentgens (mR).

A summary of the first quarter CY2008 analytical results for gross alpha and beta analyses are found in Tables 1 and 2. These tables show the minimum, maximum, and average values for each of the stations of the air-sampling network. The last column shows the average annual value from the previous year (CY2007) for comparison purposes. Overall the gross alpha results for the first quarter of CY2008 reflect similar values to previous quarters. These data remain consistent with the average CY2007 analyses used for comparison, especially when analytical error is considered. The first quarter CY2008 beta results are also consistent with previous results.

The first quarter gamma results for CY2008 are shown in Table 3. All of the samples are again gamma spectrum negligible (i.e. gamma emitting radionuclides were not detected) with the exception of Beryllium (Be)-7 a naturally occurring element of the atmospheric and geological environment. Overall, these data are consistent with previous analytical results.

The TLD results for the first quarter of CY2008 are shown in Table 4. Overall, the results display similar values to the previous quarters of the last calendar year. The 2007 PIC exposure rate and TLD data are also shown for comparison. As with historical data, TLD values are commonly lower than the PIC results. The overall estimated annual exposure based on the first quarter shows consistent agreement with CY2007.

Finally, as station managers, your input concerning the contents of these reports is welcome and encouraged. We are interested in anything you feel would be helpful for you to interpret the data or to enable you to explain the information to someone in your community not familiar with the program.

Table 1. Gross Alpha Analytical Results for the First Quarter of Calendar Year 2008
(Average analytical error, +/- 0.0007)

Station	Minimum (pCi/m ³)	Maximum (pCi/m ³)	Average (pCi/m ³)	2007 Average (pCi/m ³)
Alamo	0.0005	0.0025	0.0016	0.0020
Amargosa	0.0007	0.0022	0.0013	0.0013
Beatty	0.0006	0.0029	0.0018	0.0017
Boulder City	0.0009	0.0033	0.0023	0.0026
Caliente	0.0008	0.0031	0.0017	0.0019
Cedar City	0.0004	0.0013	0.0009	0.0011
Delta	0.0004	0.0019	0.0012	0.0012
Duckwater	0.0007	0.0016	0.0012	0.0011
Ely	0.0006	0.0021	0.0010	0.0011
Garden Valley	0.0006	0.0016	0.0011	0.0011
Goldfield	0.0007	0.0016	0.0010	0.0012
Henderson	0.0004	0.0020	0.0012	0.0014
Indian Springs	0.0007	0.0015	0.0012	0.0012
Las Vegas	0.0019	0.0032	0.0025	0.0028
Mesquite	0.0009	0.0020	0.0013	0.0017
Milford	0.0008	0.0020	0.0012	0.0014
Nyala	0.0005	0.0011	0.0009	0.0010
Overton	0.0008	0.0030	0.0018	0.0017
Pahrump	0.0007	0.0027	0.0016	0.0015

Pioche	0.0006	0.0014	0.0010	0.0012
Rachel	0.0006	0.0036	0.0017	0.0015
Sarcobatus	0.0011	0.0029	0.0019	0.0021
St. George	0.0004	0.0020	0.0013	0.0014
Stone Cabin	0.0006	0.0017	0.0012	0.0010
Tecopa	0.0006	0.0034	0.0015	0.0015
Tonopah	0.0005	0.0017	0.0012	0.0013
Twin Springs	0.0006	0.0018	0.0010	0.0012

Table 2. Gross Beta Analytical Results for the First Quarter of Calendar Year 2008.
(Average analytical error, +/- 0.003)

Station	Minimum (pCi/m ³)	Maximum (pCi/m ³)	Average (pCi/m ³)	2007 Average (pCi/m ³)
Alamo	0.010	0.022	0.017	0.022
Amargosa	0.011	0.022	0.018	0.023
Beatty	0.011	0.025	0.018	0.024
Boulder City	0.011	0.025	0.020	0.026
Caliente	0.010	0.022	0.018	0.024
Cedar City	0.010	0.022	0.014	0.021
Delta	0.009	0.024	0.017	0.025
Duckwater	0.011	0.021	0.016	0.021
Ely	0.011	0.019	0.015	0.021
Garden Valley	0.011	0.022	0.017	0.022
Goldfield	0.012	0.020	0.015	0.021
Henderson	0.009	0.025	0.017	0.023
Indian Springs	0.011	0.022	0.017	0.022
Las Vegas	0.013	0.027	0.020	0.026
Mesquite	0.012	0.025	0.019	0.027
Milford	0.009	0.025	0.018	0.026
Nyala	0.010	0.022	0.018	0.020
Overton	0.013	0.029	0.019	0.025
Pahrump	0.013	0.023	0.018	0.023

Pioche	0.008	0.019	0.014	0.021
Rachel	0.012	0.025	0.019	0.023
Sarcobatus	0.013	0.026	0.018	0.024
St. George	0.013	0.024	0.020	0.025
Stone Cabin	0.011	0.021	0.015	0.021
Tecopa	0.014	0.030	0.021	0.025
Tonopah	0.009	0.021	0.015	0.020
Twin Springs	0.010	0.022	0.016	0.022

Table 3. Gamma Spectroscopy Results for the First Quarter of Calendar Year 2008.

Station	Cs-137 (pCi/sample)	Cs-137 (MDC)	Be-7 (pCi/m ³)	Pb-210 (pCi/m ³)
Alamo	0.0	12.0	0.073	N.D.
Amargosa	0.0	8.1	0.105	N.D.
Beatty	1.1	7.9	0.096	N.D.
Boulder City	-0.7	7.5	0.089	N.D.
Caliente	1.7	8.3	0.094	N.D.
Cedar City	2.1	9.0	0.075	N.D.
Delta	0.4	7.2	0.082	N.D.
Duckwater	-6.0	16.0	0.111	N.D.
Ely	2.1	6.7	0.091	N.D.
Garden Valley	0.0	13.0	0.125	N.D.
Goldfield	2.0	10.0	0.088	N.D.
Henderson	0.0	15.2	0.103	N.D.
Indian Springs	0.0	8.4	0.095	N.D.
Las Vegas	2.5	9.2	0.087	N.D.
Mesquite	0.0	7.6	0.093	N.D.
Milford	-0.6	7.9	0.101	N.D.
Nyala	0.0	9.8	0.076	N.D.
Overton	2.1	12.0	0.078	N.D.
Pahrump	-0.5	12.0	0.105	N.D.

Pioche	0.3	7.0	0.096	N.D.
Rachel	0.1	9.2	0.109	N.D.
Sarcobatus	-9.0	20.0	0.122	N.D.
St. George	1.8	10.0	0.098	N.D.
Stone Cabin	3.4	9.6	0.093	N.D.
Tecopa	-0.9	16.0	0.082	N.D.
Tonopah	0.3	10.0	0.073	N.D.
Twin Springs	-4.0	17.0	0.083	N.D.

MDC Be-7 = 0.022 pCi/m³ Pb-210 = 0.006 pCi/m³ N.D. = not detected

Table 4. TLD Analytical Results for the First Quarter of Calendar Year 2008

Station	First Quarter Exposure (mR)	Est. Annual Exposure (mR/yr)	2007 TLD Exposure (mR/yr)	2007 PIC Exposure (mR/yr)
Alamo	28	112	109	120
Amargosa	26	104	102	109
Beatty	36	144	142	148
Boulder City	26	103	97	135
Caliente	27	108	118	143
Cedar City	24	96	94	96
Delta	25	100	92	102
Duckwater	28	112	110	104
Ely	24	104	93	104
Garden Valley	35	152	145	163
Goldfield	30	120	113	134
Henderson	29	115	110	138
Indian Springs	23	92	100	101
Las Vegas	25	95	87	92
Medlins Ranch	34	146	127	150
Mesquite	25	97	97	105
Milford	38	153	136	168
Nyala	27	116	106	119
Overton	23	89	82	92
Pahrump	20	80	74	72

Pioche	27	108	103	123
Rachel	34	136	123	137
Sarcobatus	36	144	143	153
St. George	21	85	83	81
Stone Cabin	31	135	131	155
Tecopa	26	104	113	130
Tonopah	35	140	125	143
Twin Springs	37	163	148	170
