2014 Consumer Confidence Report

Water System Name: **Lawrence Livermore National Lab Site 300** Report Date: 6/30/15

We test the drinking water quality for many constituents as required by state and federal regulations. This report shows the results of our monitoring for the period of January 1 - December 31, 2014 and may include earlier monitoring data.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien.

Type of water source(s) in use: Groundwater wells

Name & general location of source(s): Well 20 (primary) and Well 18 (backup) located west of the General Services Area (GSA)

Drinking Water Source Assessment information:

An assessment was completed of the Well 18 and Well 20 water sources for the Lawrence Livermore National Laboratory (LLNL) Site 300 Drinking Water System in October 2001. A copy of the complete assessment is available at the LLNL Site 300 Facilities and Infrastructure Office. You may request that a summary of the assessment be sent to you by contacting the Site 300 Facilities & Infrastructure Office at 925-423-5211. Both Well 18 and Well 20 are considered to be most vulnerable to existing known contaminant plumes within the shallow aquifers that currently are being addressed at Site 300 under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The vulnerability ranking for both wells was 13. No constituents associated with past events resulting in contamination of the shallow aquifers have been detected in the regional aquifer (Lower Tnbs1) where Wells 18 and 20 are screened. The Lower Tnbs1 is isolated from the shallow aquifers by a confining layer in the Tnsc1. The *Final Site Wide-Remedial-Investigation Report* for Site 300 provides a detailed evaluation of ground water contamination at Site 300 (1994).

Time and place of regularly scheduled board meetings for public participation: NA

For more information, contact: Wendy Bellah Phone: (925) 423-6626

TERMS USED IN THIS REPORT

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Primary Drinking Water Standards (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Variances and Exemptions: State Board permission to exceed an MCL or not comply with a treatment technique under certain conditions.

ND: not detectable at testing limit

ppm: parts per million or milligrams per liter (mg/L)

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

ppb: parts per billion or micrograms per liter (µg/L)

ppt: parts per trillion or nanograms per liter (ng/L)

ppq: parts per quadrillion or picogram per liter (pg/L)

pCi/L: picocuries per liter (a measure of radiation)

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- *Inorganic contaminants*, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- *Pesticides and herbicides*, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- *Organic chemical contaminants*, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- *Radioactive contaminants*, that can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the USEPA and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Tables 1, 2, 3, 4, 5, 7, and 8 list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The State Board allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative of the water quality, are more than one year old.

TABLE 1 – SAMPLING RESULTS SHOWING THE DETECTION OF COLIFORM BACTERIA

Microbiological Contaminants (complete if bacteria detected)	**Highest No. of Detections**	**No. of months in violation**	**MCL**	**MCLG**	**Typical Source of Bacteria**
Total Coliform Bacteria	(In a mo.) 0	0	More than 1 sample in a month with a detection	0	Naturally present in the environment
Fecal Coliform or *E. coli*	(In the year) 0	0	A routine sample and a repeat sample detect total coliform and either sample also detects fecal coliform or *E. coli*	0	Human and animal fecal waste

TABLE 2 – SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER

Lead and Copper (complete if lead or copper detected in the last sample set)	**Sample Date**	**No. of samples collected**	**90th percentile level detected**	**No. sites exceeding AL**	**AL**	**PHG**	**Typical Source of Contaminant**
Lead (ppb)	8/3/14	5	4.35	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits

Copper (ppm)	8/3/14	5	0.058	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

TABLE 3 – SAMPLING RESULTS FOR SODIUM AND HARDNESS

Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**MCL**	**PHG (MCLG)**	**Typical Source of Contaminant**
Sodium (ppm)	1/24/12	250.5	229 to 272	none	none	Salt present in the water and is generally naturally occurring
Hardness (ppm)	1/24/12	18.3	15 to 21.6	none	none	Sum of polyvalent cations present in the water, generally magnesium and calcium, and are usually naturally occurring

***Any violation of an MCL or AL is asterisked. Additional information regarding the violation is provided later in this report.*

TABLE 4 – DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**MCL [MRDL]**	**PHG (MCLG) [MRDLG]**	**Typical Source of Contaminant**
Chlorine (Cl) (ppm)	Monthly	0.69	0.1 to 2.0	4	4	Drinking water disinfectant added for treatment
Barium (Ba) (ppb)	1/24/2012	16.35	14.1 to 18.6	1000	2000	Discharge of oil drilling wastes and from metal refineries; erosion of natural deposits
Fluoride (F) (Natural-Source) (ppm)	1/24/2012	0.25	0.2 to 0.3	2	1	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Lead (Pb) (ppb)	1/24/2012	0.65	0 to 1.3	AL=15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Total Trihalomethanes (TTHMs) (ppb)	6/30/14; 8/3/14 8/5/14; 9/1/14	**86***	2.8 to 100	80	N/A	By-product of drinking water disinfection
Haloacetic Acids (HAA5) (ppb)	6/30/14; 8/3/14 8/5/14; 9/1/14	11	ND to 14	60	N/A	By-product of drinking water disinfection
Gross Alpha (pCi/L)	1/24/2012	0.9725	0.085 to 1.86	15	0	Erosion of natural deposits
Gross Beta (pCi/L)	1/24/2012	2.355	2.13 to 2.58	50	0	Decay of natural and man-made deposits
Strontium – 90 (pCi/L)	1/24/2012	0.117	0 to 0.234	8	0.35	Decay of natural and man-made deposits
Tritium (pCi/L)	1/24/2012	58.225	6.45 to 110	20000	400	Decay of natural and man-made deposits

TABLE 5 – DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD						
Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**MCL**	**PHG (MCLG)**	**Typical Source of Contaminant**
Iron (Fe) (ppb)	1/24/2012	65	0 to 130	300	N/A	Leaching from natural deposits; industrial wastes
Manganese (Mn) (ppb)	1/24/2012	10	0 to 20	50	N/A	Leaching from natural deposits
Turbidity, Laboratory (NTU)	1/31/2012	0.75	0.3 to 1.2	5	N/A	Soil runoff
Chloride (ppm)	1/24/2012	86.5	73 to 100	500	N/A	Leaching from natural deposits
Specific Conductance (E.C.) (umhos)	1/24/2012	1110	1020 to 1200	1600	N/A	Substances that form ions when in water, seawater influence
Sulfate (SO4) (ppm)	1/24/2012	185.5	174 to 197	500	N/A	Runoff/leaching from natural deposits, industrial wastes
Total Dissolved Solids (TDS) (ppm)	1/24/2012	675	640 to 710	1000	N/A	Runoff/leaching from natural deposits

TABLE 6 – DETECTION OF UNREGULATED CONTAMINANTS					
Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**Notification Level**	**Health Effects Language**

***Any violation of an MCL, MRDL, or TT is asterisked. Additional information regarding the violation is provided later in this report.*

Additional General Information on Drinking Water

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Summary Information for Violation of a MCL, MRDL, AL, TT, or Monitoring and Reporting Requirement

VIOLATION OF A MCL, MRDL, AL, TT, OR MONITORING AND REPORTING REQUIREMENT				
Violation	**Explanation**	**Duration**	**Actions Taken to Correct the Violation**	**Health Effects Language**
Failure to begin quarterly TTHM and HAA5 monitoring following a detection of TTHM above 80 ppb in one of the annual samples and failure to report the results to the Water Board	A TTHM sample result collected from one of the distribution sample locations (B834) in September exceeded the MCL of 80 ppb. In accordance with the Stage 2 Disinfection ByProduct Rule (S2DBPR), sampling frequency should have been increased to quarterly in the quarter immediately following the exceedance. In addition, the Water Board was not notified of the exceedance in accordance with the S2DBPR.	September 2014 through current	Quarterly sampling began in June 2015 and a corrective action plan is being prepared. The September 2014 and June 2015 sampling results were used to calculate the locational average TTHM concentration which was below the MCL.	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience liver, kidney, or central nervous system problems, and may have an increased risk of getting cancer.
Failure to collect required perchlorate sample in 2014	Perchlorate is a required analyte for the drinking water source wells every three years. Sampling is due in the summer months. Wells 18 and 20 were last sampled for perchlorate as part of the drinking water program in 2011 (the wells however are sampled monthly as part of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) monitoring requirements)	2014	A perchlorate sample was collected in June 2015. In addition, the perchlorate results from the required CERCLA sampling in 2014 were reviewed and perchlorate was not detected in either of the wells.	Perchlorate has been shown to interfere with uptake of iodide by the thyroid gland, and to thereby reduce the production of thyroid hormones, leading to adverse effects associated with inadequate hormone levels. Thyroid hormones are needed for normal prenatal growth and development of the fetus, as well as for normal growth and development in the infant and child. In adults, thyroid hormones are needed for normal metabolism and mental function.
Failure to collect required number of routine distribution system bacteriological samples	Water service was down at one of the sampling locations during the October 2014 sampling event and a sample was not collected once water service returned to the building later in the month.	October 2014	An additional sample of the distribution system was collected in November 2014. A revised Bacteriological Sample Siting Plan was submitted to the department to clarify sampling locations.	NA

For Water Systems Providing Ground Water as a Source of Drinking Water

TABLE 7 – SAMPLING RESULTS SHOWING FECAL INDICATOR-POSITIVE GROUND WATER SOURCE SAMPLES					
Microbiological Contaminants (complete if fecal-indicator detected)	**Total No. of Detections**	**Sample Dates**	**MCL [MRDL]**	**PHG (MCLG) [MRDLG]**	**Typical Source of Contaminant**
E. coli	1 (In the year)	8/11/14	0	(0)	Human and animal fecal waste
Enterococci	(In the year)		TT	n/a	Human and animal fecal waste
Coliphage	(In the year)		TT	n/a	Human and animal fecal waste

Summary Information for Fecal Indicator-Positive Ground Water Source Samples, Uncorrected Significant Deficiencies, or Ground Water TT

SPECIAL NOTICE OF FECAL INDICATOR-POSITIVE GROUND WATER SOURCE SAMPLE

A positive total coliform result was reported in the sample collected from Well 18 on 8/5/14. The regulator was notified and Well 18 was immediately isolated from the distribution system and the system resampled on 8/11/14. Total coliform and E. coli were detected in the repeat sample. It was theorized that a faulty seal on the pump was leaking water that was attracting bees from hives across the road. It was believed some of these bees were sucked into the well casing as the water drew down during pump operation and the decomposition caused the coliform detections. Well 18 was kept isolated from the distribution system through August and September and was returned to service in October following negative total coliform sampling results in September and October.

SPECIAL NOTICE FOR UNCORRECTED SIGNIFICANT DEFICIENCIES

VIOLATION OF GROUND WATER TT

TT Violation	Explanation	Duration	Actions Taken to Correct the Violation	Health Effects Language

For Systems Providing Surface Water as a Source of Drinking Water

TABLE 8 - SAMPLING RESULTS SHOWING TREATMENT OF SURFACE WATER SOURCES	
Treatment Technique [(a)] (Type of approved filtration technology used)	
Turbidity Performance Standards [(b)] (that must be met through the water treatment process)	Turbidity of the filtered water must: 1 – Be less than or equal to _____ NTU in 95% of measurements in a month. 2 – Not exceed _____ NTU for more than eight consecutive hours. 3 – Not exceed ____ NTU at any time.
Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1.	
Highest single turbidity measurement during the year	
Number of violations of any surface water treatment requirements	

(a) A required process intended to reduce the level of a contaminant in drinking water.

(b) Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements.

** Any violation of a TT is marked with an asterisk. Additional information regarding the violation is provided below.*

Summary Information for Violation of a Surface Water TT

VIOLATION OF A SURFACE WATER TT				
TT Violation	**Explanation**	**Duration**	**Actions Taken to Correct the Violation**	**Health Effects Language**

Summary Information for Operating Under a Variance or Exemption