

# 2011 Drinking Water Quality Report for Nellis Air Force Base

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This report is a snapshot of calendar year 2011 drinking water quality at Nellis AFB. It is required by the Environmental Protection Agency (EPA) Safe Drinking Water Act (SDWA) which was passed by Congress in 1974. The purpose of the SDWA is to protect public health by regulating the nation's public drinking water supply. It was amended in 1996 to require states to develop and implement source water assessment programs for existing and potential threats to the quality of public drinking water and to include a summary of the assessment in the water system's annual consumer confidence report (CCR). Specifically, states are required to delineate the sources of public drinking water, identify potential contamination sources within the delineated area, assess the water system's susceptibility to contamination and inform the public of the results. These results are summarized below:

## **Where does my water come from?**

Most of the Nellis AFB drinking water comes from Lake Mead and is supplied by the Southern Nevada Water Authority (SNWA). The SNWA water is supplemented by a small percentage of groundwater from wells on and near the base. The well water comes from the Las Vegas Valley Aquifer.

Virtually all of the water in Lake Mead begins as snowmelt in the Rocky Mountains and arrives via the Colorado River. The Las Vegas Wash, which carries storm water and treated wastewater into Lake Mead, accounts for less than 2 percent of all the water in the lake. The Virgin River and Muddy River also combine to provide approximately 1.5 percent of the water in Lake Mead.

Potential sources of contamination for lakes and reservoirs include wildlife and industrial activities [urban chemicals such as fertilizers and pesticides]. Landfills, domestic septic systems, and leaking underground storage tanks are all potential sources of contamination for groundwater aquifers.

## **Treatment Process**

SNWA has advanced water treatment facilities designed to provide water that meets SDWA standards.

All the water drawn from Lake Mead is sent to the Alfred Merritt Smith or River Mountains water treatment facilities. As it arrives, the water is treated with chlorine and

ozone to kill any potentially harmful microscopic organisms. A multistage filtration system is used to remove particles from the water.

As the water leaves the water treatment facility, additional chlorine is added to protect it on the way to customer taps. The water is also treated to prevent corrosion of the pipelines. The water from base wells are chlorinated by Civil Engineering Utilities and then mixed with the SNWA water.

In addition to the SNWA supplied surface water, the Nellis AFB public water system consists of eight active wells (four potable and four irrigational). Three of the eight wells are located off base and are currently in compliance with revised arsenic maximum contaminant level (MCL) of 10 parts per billion (ppb). The remaining five of the eight active wells are located on base. Four of the five have arsenic concentrations that exceed the MCL, but are used only for irrigational purposes. The remaining well on-base is blended with off-base water; the resultant arsenic concentration is below the arsenic MCL of 10 ppb. Rest assured, the water shop maintains a staff of well-trained professionals who operate and maintain the system.

## **Analysis and Compliance**

Every month, technicians from SNWA collect and analyze water samples from the Nellis AFB drinking water system and its water treatment facilities. In fact, the water is tested even more frequently and extensively than the SDWA and the Nevada Administrative Code requires. The test results are shown in the table below. Contact the Bioenvironmental Engineering Flight (BEF) at 702-653-3316 if you would like more information.

We routinely monitor for disinfectant residual in the distribution system. This measurement tells us whether we are effectively disinfecting the water supply. Disinfectant residual is the amount of chlorine present in the pipes of the distribution system. If the amount of disinfectant is too low, organisms could grow in the pipes.

Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. However, these symptoms are not caused solely by organisms in drinking water, but can be attributed to other factors.

While Nellis AFB drinking water meets the EPA standard for arsenic, it does contain low levels of arsenic. EPA standard balances the current understandings of the possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

## **Why are there contaminants in my 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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

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, in some cases naturally occurring radioactive material, and can pick up substances resulting from the presence of animals or human activity.

### **Contaminants potentially present in source (untreated) water include:**

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm runoff and industrial or domestic wastewater discharges.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential use.
- Organic chemical contaminants, including synthetic or volatile organic chemicals, which are byproducts of industrial processes and can come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or the result of industrial activities.

In order to ensure tap water is safe to drink, the EPA prescribes regulations to limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water and must provide the same protection for public health. For more information on bottled water quality, call the International Bottled Water Association at 800-WATER11.

### **2011 Maximum Contaminant Limit (MCL) Violations**

The water system servicing the north side of Nellis AFB, known as Area II, and the golf course exceeded the MCL level for total trihalomethanes (TTHM) according to results from a routine test performed 28 Sept 2011 at Nellis AFB. The running annual average for TTHM is 0.080 milligrams per liter (mg/L) and the level of TTHM for the Nellis AFB drinking water system between December 2010 and September 2011 was 0.0848 mg/L. The violation lasted approximately three months. In December 2011, fourth quarter results reduced the running annual average to 0.080 mg/L, bringing Nellis AFB into compliance.

Trihalomethanes (THM) form naturally in a water system when chlorine reacts with organic compounds in the water. The base continually balances the disinfectant level in order to keep the system in equilibrium, much like chlorinating a swimming pool.

People who drink water containing THM's in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and have an increased risk of cancer.

### **Do I need to take special precautions?**

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. EPA/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 EPA Safe Drinking Water Hotline at 1-800-426-4791.

### **Other Health Information**

The following substances are monitored by SNWA but are not regulated under the SDWA. We have included this information because consumers have a right to know about anything affecting their water.

#### **Cryptosporidium**

Cryptosporidium is a naturally occurring microscopic organism which is found in 95 % of all surface water in the United States. If ingested, it can cause gastrointestinal distress and fever. Filtration, sedimentation, and disinfection using ultraviolet light and ozone are generally effective at removing Cryptosporidium. SNWA carefully monitors the water for the presence of this organism.

#### **Perchlorate**

Perchlorate, a man-made salt consisting of chloride and oxygen, has been detected at low levels in untreated and treated water. Scientists have traced the origin of the salt to shallow groundwater entering the Las Vegas Wash. Although there are no federal limits for perchlorate in drinking water, SNWA is closely monitoring efforts by the Nevada Division of Environmental Protection to intercept and remove perchlorate at its source.

### **Frequently Asked Questions**

#### **Is my tap water safe to drink?**

Your tap water meets or surpasses all SDWA standards. The Alfred Merritt Smith Water Treatment Facility has been recognized by the National Partnership for Safe Water for its

efforts to ensure the Southern Nevada's municipal water meets these water quality standards. Water samples are taken from our water distribution system monthly and analyzed to ensure compliance with standards.

### **If tap water is really of good quality, why does it taste the way it does?**

The taste of the water is caused by naturally occurring minerals and chlorine. The chlorine is added to keep the water safe from bacteria. Water quality is best measured by the amount and concentration of contaminants. We have very few contaminants in our drinking water and those that are present are within SDWA limits.

### **Do I need to use a water treatment system or drink bottled water?**

Not unless you want to improve the taste of your water or remove the minerals that cause it to be "hard". While many people prefer the taste of bottled water, tap water is subject to more stringent quality standards and is tested more frequently. Additionally, the cost of the average liter of bottled water is more than 1,000 times the same amount of tap water. Pregnant women and people with medical conditions affecting their immune system should consult a physician to determine whether a supplemental treatment system is appropriate. For additional information on home water treatment systems, contact the SNWA at 702-862-3400 or visit their website at [www.snwa.com](http://www.snwa.com).

### **How will I be notified if a significant health risk associated with my water quality develops?**

This report is considered the appropriate mechanism for notifying the consumer of routine/non-emergency compliance violations. Certain emergency situations may warrant a more active notification effort, including but not limited to: additional publications, postings in public places, mass-mailings, or working through other well-established mass-notification systems.

### **Additional Information and Input**

If you would like a copy of this report or have questions, please contact the 99 ABW Public Affairs office at 702-652-2750, [99abw.pacurrent@nellis.af.mil](mailto:99abw.pacurrent@nellis.af.mil). Questions and comments can also be mailed to the 99 ABW Public Affairs office at: 99 ABW/PA, 4430 Grissom Ave, Bldg 11, Ste 107 Nellis AFB, NV 89191. The most current source water assessments are available at the BEF office for the Nellis AFB wells, and through SNWA for water provided by SNWA. If there are any future concerns about the quality of water at Nellis AFB, town hall meetings will be held at the base theater or the community center.

For additional information on the quality of your water, call SNWA at 702-862-3400 or go to the SNWA website at [www.snwa.com](http://www.snwa.com). Information on Nevada's Safe Drinking Water Program is available from the Nevada Division of Environmental Protection at

775-687-4670. General information for drinking water can be found in the EPA's website at [www.epa.gov/safewater](http://www.epa.gov/safewater).

## **Water Quality Data Tables**

The tables below list the drinking water contaminants detected. The presence of contaminants in the water does not necessarily indicate the water poses a health risk. Unless otherwise noted, the data presented in the tables are from testing completed in the 2011 calendar year. The EPA or the State requires Nellis AFB to monitor for certain contaminants less than yearly because the concentrations of these contaminants do not change frequently.

NAFB 2011 CCR TABLE	REGULATED CONTAMINANTS	UNIT	MCL (EPA Limit)	MCLG (EPA Goal)	NELLIS AIR FORCE BASE DISTRIBUTION SYSTEM <sup>(1)</sup>			RESERVOIR #491 <sup>(1)</sup>			RESERVOIR #562 <sup>(1)</sup>			ALFRED MERRITT SMITH WATER TREATMENT FACILITY <sup>(1)</sup>			RIVER MOUNTAINS WATER TREATMENT FACILITY <sup>(1)</sup>			POSSIBLE SOURCES OF CONTAMINATION		
					MINIMUM	MAXIMUM	AVERAGE	MINIMUM	MAXIMUM	AVERAGE	MINIMUM	MAXIMUM	AVERAGE	MINIMUM	MAXIMUM	AVERAGE	MINIMUM	MAXIMUM	AVERAGE			
Alpha Particles	pCi/L	15	0	Entry Point Monitoring Only			3.5	3.5	3.5	3.7	3.7	3.7	N/D	N/D	N/D	3.3	3.3	3.3	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as			
Arsenic	ppb	10	0				2	2	2 <sup>(2)</sup>	2	17 <sup>(3)</sup>	8 <sup>(2)(4)</sup>	1	2	2	2	2	2	2	2	Erosion of natural deposits	
Barium	ppm	2	2				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Erosion of natural deposits; discharge from metal refineries; discharge of drilling wastes	
Beta Particles and Photon Emitters	pCi/L	50 <sup>(5)</sup>	0				N/D	N/D	N/D	N/D	N/D	N/D	3.5	3.5	3.5	3.2	3.2	3.2	3.2	3.2	3.2	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit a form of radiation known as photons and beta radiation
Bromate	ppb	10	0				N/A			4	10 <sup>(6)</sup>	6 <sup>(2)</sup>	1	8	3 <sup>(2)</sup>				By-product of drinking-water disinfection with ozone			
Chromium	ppb	100	100				N/D	N/D	N/D	4	4	4	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	Erosion of natural deposits; discharge from steel and pulp mills
Copper <sup>(7)(8)</sup>	ppm	1.3 <sup>(9)</sup> (Action Level)	1.3	0.03	0.88	0.69 (90th% value)	DISTRIBUTION SYSTEM MONITORING ONLY											Corrosion of household plumbing systems; erosion of natural deposits				
Fluoride	ppm	4.0	4.0	0.6	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.7	0.8	0.7	0.7	0.8	0.7	Erosion of natural deposits; water additive <sup>(10)</sup>			
Free Chlorine Residual	ppm	4.0 <sup>(11)</sup> (MRDL)	4.0 <sup>(11)</sup> (MRDLG)	0.04	3.1	1.2 <sup>(2)</sup>	DISTRIBUTION SYSTEM MONITORING ONLY											Water additive used to control microbes				
Haloacetic Acids							DISTRIBUTION SYSTEM MONITORING ONLY															
Stage 1 DBP Rule <sup>(12)</sup>	ppb	60	N/A <sup>(13)</sup>	18	62 <sup>(15)</sup>	37 <sup>(2)</sup>	DISTRIBUTION SYSTEM MONITORING ONLY											By-product of drinking-water disinfection				
Stage 2 DBP Rule (IDSE) <sup>(12)(14)</sup>	ppb	N/A	N/A	N/D	37	18	DISTRIBUTION SYSTEM MONITORING ONLY															
Lead <sup>(7)(8)</sup>	ppb	15 <sup>(9)</sup> (Action Level)	0	N/D	3.1	2.4 (90th% value)	DISTRIBUTION SYSTEM MONITORING ONLY											Corrosion of household plumbing systems; erosion of natural deposits				
Nitrate (as Nitrogen)	ppm	10	10	Entry Point Monitoring Only			0.5	0.6	0.5	0.2	1.0	0.6	0.4	0.7	0.6	0.4	0.8	0.6	0.6	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits		
Radium 226 and 228 (combined)	pCi/L	5	0				N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	0.2	0.2	0.2	0.2	Erosion of natural deposits
Selenium	ppb	50	50				2	2	2	2	2	2	2	2	2	3	2	2	3	2	2	Erosion of natural deposits; discharge from mines; component of petroleum
Total Coliforms	number positive per month	≤ 1	0	0	1	<1	DISTRIBUTION SYSTEM MONITORING ONLY											Naturally present in the environment				
Total Trihalomethanes							DISTRIBUTION SYSTEM MONITORING ONLY															
Stage 1 DBP Rule <sup>(12)</sup>	ppb	80	N/A <sup>(13)</sup>	44	150 <sup>(16)</sup>	85 <sup>(2)</sup>	DISTRIBUTION SYSTEM MONITORING ONLY											By-product of drinking-water disinfection				
Stage 2 DBP Rule (IDSE) <sup>(12)(14)</sup>	ppb	N/A	N/A	11	88	59	DISTRIBUTION SYSTEM MONITORING ONLY															
Turbidity	NTU	95% of the samples <0.3 NTU <sup>(17)</sup>	N/A	Treatment Facility Monitoring Only								100% of the samples were below 0.3 NTU. The maximum NTU was 0.071 on November 24, 2011.			100% of the samples were below 0.3 NTU. The maximum NTU was 0.075 on February 8, 2011.			Soil runoff				
Uranium	ppb	30	0	Entry Point Monitoring Only			3	3	3	1	1	1	4	4	4	4	4	4	4	Erosion of natural deposits		

**Footnotes:**

- (1) Some Safe Drinking Water Act (SDWA) regulations require monitoring from the distribution system, while other SDWA regulations require monitoring at the entry points to the distribution system. (Alfred Merritt Smith WTF, River Mountains WTF, and NAFB Reservoirs)
- (2) This value is the highest running annual average reported in 2011. Reports are filed quarterly.
- (3) Maximum levels greater than the MCL are allowable as long as the running annual average does not exceed the MCL.
- (4) While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.
- (5) The actual MCL for beta particles is 4 mrem/year. The U. S. Environmental Protection Agency (USEPA) considers 50 pCi/L to be the level of concern for beta particles.
- (6) Maximum levels equal to or greater than the MCL are allowable as long as the running annual average does not exceed the MCL.
- (7) Samples are from the NAFB customers' taps.
- (8) Annual testing not required, data from 2009.
- (9) Lead and copper are regulated by a Treatment Technique (TT) that requires systems to control the corrosiveness of their water. If more than 10% of tap-water samples exceed the action level, water systems must take additional steps. For copper the action level is 1.3 ppm, and for lead it is 15 ppb.
- (10) By state law, the Southern Nevada Water Authority (SNWA) is required to fluoridate the municipal water supply. This law is not applicable to groundwater.
- (11) Chlorine is regulated by MRDL, with the goal stated as a MRDLG.
- (12) The Stage 1 Disinfectants and Disinfection By-products (DBP) Rule regulates current data collection and monitoring for Haloacetic Acids and Total Trihalomethanes in the distribution system. The Stage 2 DBP Rule was finalized on January 4, 2006 and collects Initial Distribution System Evaluation (IDSE) data designed to assist in selection of new, future sample locations for DBP testing.
- (13) No collective MCLG but there are MCLGs for some of the individual contaminants. Haloacetic Acids: dichloroacetic acid (0), trichloroacetic acid (300 ppb); Trihalomethanes: bromodichloromethane (0), bromoform (0), dibromochloromethane (60 ppb).
- (14) Data from 2007-2008.
- (15) Maximum levels greater than the MCL are allowable as long as the running annual average of all locations does not exceed the MCL. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of cancer.
- (16) Maximum levels greater than the MCL are allowable as long as the running annual average of all locations does not exceed the MCL. Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems of the liver, kidneys, central nervous system, and may have an increased risk of cancer.
- (17) Turbidity is regulated by a Treatment Technique (TT) requirement - 95% of all samples taken after filtration each month must be less than 0.3 NTU. Maximum turbidity cannot exceed 1.0 NTU.

**Definitions:**

**Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

**Disinfection by-product (DBP):** A substance created by the chemicals or processes used to destroy potentially harmful microorganisms.

**Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**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 allow for a margin of safety.

**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.

**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 contamination.

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

**Millirem (mrem):** one-thousandth of a rem (roentgen-equivalent-man), which is a unit of absorbed radiation dose that is adjusted for the biological effects equal to one rad of 250 kilovolt roentgen rays (dental roentgen rays require less than 100 kilovolts).

**N/A:** Not applicable

**N/D:** Not detected. Does not equate to zero, but refers to an amount below analytical reporting limits.

**Nephelometric Turbidity Unit (NTU):** A measurement of water's clarity.

**Part per billion (ppb):** A unit used to describe the levels of detected contaminants. Equivalent to 1 cent in \$10 million.

**Part per million (ppm):** A unit used to describe the levels of detected contaminants. Equivalent to 1 cent in \$10,000.

**Picocuries per liter (pCi/L):** A measure of the radioactivity in water. Low levels of radiation occur naturally in many water systems, including the Colorado River.

**Running annual average:** Based on the monitoring requirements, the average of 12 consecutive monthly averages or the average of four consecutive quarters.

**Turbidity:** A measure of water clarity, which serves as an indicator of the treatment facility's performance.