Public Health Protection

	Comment or Question	Response
1	What is the City doing to remove pharmaceuticals in the purified water?	The purification process is highly effective at removing pharmaceuticals, hormones, pesticides, and insecticides, some which are regulated and others which are contaminants of emerging concern (CECs). Section 9 of the Title 22 Engineering Report goes into great detail on the analytical results, including constituents that have primary and secondary maximum contaminant levels, notification levels, and are unregulated contaminants. All the results met drinking water standards for chemicals that are regulated, including pesticides and insecticides. A total of 116 CECs were sampled and of those, only 9 were detected at any measurable level. While each CEC had 16 to 18 sampling events, 7 of the CECs were only detected once and 2 were only detected twice. The concentrations of the detections were significantly below any health concern. For example, for one CEC that was a pharmaceutical (diclofenac – a non-steroidal anti-inflammatory drug used to treat mild pain such as arthritis) a person would have to have to drink 2 liters (about ½ a gallon) of water a day for 30 years to get one therapeutic dose.
2	Do the federal and state drinking water standards regulate pharmaceuticals? I have read reports that sewage often contains a multitude of pharmaceutical compounds that enter the waste stream either because drugs are flushed down a toilet, or drugs are excreted. The list of such pharmaceuticals could be immense, so I would doubt that there is a standard safe level for every drug. I would be concerned that even in small amounts, certain drugs (hormones, anti-depressants, etc.) in the "purified" water could pose a hazard to those individuals drinking that water.	The federal and state drinking water regulations have not set standards for pharmaceuticals. Some pharmaceuticals, personal care products and hormones have been included in the Unregulated Contaminant Monitoring Rule, which is now in its fourth monitoring phase. The Environmental Protection Agency is required to prepare a list every 5 years of no more than 30 unregulated contaminants to be monitored by public water systems to determine if those contaminants occur in their supply. As a part of the Pure Water Demonstration Plant testing, a total of 116 contaminants of emerging concern (CECs) were sampled and included pharmaceuticals that have been found in other supplies. Of those 116 CECs, only 9 were detected at any measurable level. While each CEC had 16 to 18 sampling events, 7 of the CECs were only detected once and 2 were only detected twice. The concentrations of the detections were significantly below any health concern. For example, for one CEC that was a pharmaceutical (diclofenac – a non-steroidal anti-inflammatory drug used to treat mild pain such as arthritis) a person would have to have to drink 2 liters (about ½ a gallon) of water a day for 30 years to get one therapeutic dose.
3	If the purified water is clean enough to drink, then why pump it up to Lake Miramar, where it would get treated yet again before entering the City drinking water system? If the water truly is safe to drink, why not put it right into the water supply? The inference is that the purified water is not quite ready to drink if you must dilute it in Lake Miramar and treat it again.	Although the water that is released to the reservoir is very highly treated, it will not be considered drinking water until it is treated at the Miramar Water Treatment Plant. The recent regulations adopted by the State Water Resources Control Board are for surface water augmentation, not direct potable reuse. Releasing the water into the reservoir allows for a time buffer to ensure that the water is safe, because this is one of the first surface water augmentation projects in the State of California. The Division of Drinking Water is currently developing a regulation for direct potable reuse that may not require the purified water to be treated again at a drinking water treatment plant. That regulation may be drafted by the end of 2023.
4	In the Title 22 Engineering Report, Table 1-6, "Water Quality Comparison of Imported Water and Purified Water," is only for chemical components. Can this table be extended, or tables added, to present a comparison of imported and purified water regarding biological (virus/*giardia/cryptosporidium*) and radionuclide components?	The purpose of Table 1-6 and, similarly, Table 12-2 in the Title 22 Engineering Report is to provide a comparison of general water quality parameters often used to characterize drinking water. Purified water quality that will be released into Miramar Reservoir is more completely described in Section 9 of the Title 22 Engineering Report. Table 9-5 specifically addresses radionuclides. The City's Water Quality Report, showing the results of water quality measured at the City's three drinking water plants, can be found at https://www.sandiego.gov/water/quality/reports.

Public Health Protection

	Comment or Question	Response
5	How do I know cytotoxic drugs will not end up in the water? There are numerous oncology patients in San Diego who are given chemotherapy which is then excreted and flushed. I was under the impression most of these drugs can pass through filtration and live for years in soils.	Pharmaceuticals, personal care products, and constituents of emerging concern (CECs) can pass through granular media filtration, but are removed effectively by granular activated carbon, reverse osmosis, ozone and ultraviolet disinfection with advanced oxidation, and chlorine. The latter five processes are all part of the Pure Water process. While these specific cytotoxic drugs have not been monitored for at the North City Pure Water Demonstration Facility, we have years of experience characterizing the control of different chemicals through the treatment train. The most powerful single barrier to chemical contaminants is reverse osmosis, which is particularly effective at removing dissolved salts, organic matter and trace organic chemicals. According to the American Cancer Society, some of the most common chemotherapy drugs include doxorubicin (543 g/mol), epirubicin (543 g/mol), paclitaxel (854 g/mol), docetaxel (808 g/mol), cyclophosphamide (261 g/mol), and carboplatin (371 g/mol). Based on the high molecular weight of these molecules (> 200 g/mol), they will be well removed through reverse osmosis. There are some smaller cytotoxic drugs such as 5-fluorouracil (130 g/mol) that may not be well removed by reverse osmosis but are degraded or removed through other processes at the North City Pure Water Facility such as ozone, biologically activated carbon, and ultraviolet disinfection with advanced oxidation (Xie, H (2012) Occurrence, Ecotoxicology, and Treatment of Anticancer Agents as Water Contaminants. J Environ Anal Toxicol S2:002. doi:10.4172/2161-0525.S2-00). The robust treatment at the North City Pure Water Facility provides removal of a large range of compounds by various removal mechanisms. In addition, please see the response to Question 1 regarding the monitoring performed at the Pure Water Demonstration Plant for CECs.
6	Are we putting our future generation in danger only to avoid paying for Point Loma Plant modifications?	The Division of Drinking Water has worked closely with additional public health and water quality experts to produce a regulation that is protective of public health. The Pure Water program provides even higher levels of treatment than required by the Surface Water Augmentation regulations.

Public Health Protection

	Comment or Question	Response
7	What about cytotoxic drugs being released back into our water supply? There is literature that supports the knowledge that even a small dose of some of these drugs, which are resistant to filtration, and can do damage to a fetus, babies and growing children. Moreover, what about the entire population low dose risk over long period of time? It seems we won't know the effects of this decision until our children have children if they are not facing infertility by that point.	The Pure Water Program utilizes source control along with robust treatment mechanisms to control constituents of concern such as cytotoxic drugs. The first line of defense against cytotoxic drugs is the City's source control program for the entire wastewater system that protects the system and wastewater treatment plants from unwanted discharges including discharges from hospitals. Beyond source control, the wastewater undergoes a variety of treatment processes with different mechanisms of removal to control contaminants like cytotoxic drugs. Many cytotoxic drugs have a high molecular weight and are easily removed through reverse osmosis. For those compounds that may not be removed through reverse osmosis, the additional advanced treatment processes at the Pure Water Facility (ozone, biological activated carbon, ultraviolet disinfection with advanced oxidation, and free chlorine) utilize different removal mechanisms to control these and other contaminants. This is demonstrated through the monitoring that was performed at the Pure Water Demonstration Facility. As a part of the Pure Water Demonstration Plant testing, a total of 116 constituents of emerging concern (CECs) were sampled and included pharmaceuticals that have been found in other supplies. Of those 116 CECs, only 9 were ever detected at any measurable level. The concentrations of the detections were significantly below any health concern. For example, although sixteen (16) samples came back non-detect, there were two (2) detections of a pharmaceutical (diclofenac – a non-steroidal anti-inflammatory drug used to treat mild pain such as arthritis). At the highest concentration detected, a person would have to have to drink 2 liters (about ½ a gallon) of water a day for 30 years to get one therapeutic dose. In addition, please see the response to Question 5 regarding cytotoxic drugs and the robust treatment provided at the North City Pure Water Facility that includes treatment processes other than filtration to ensure removal of these compounds.
8	At what point does the potable reuse effort become futile if the recycled water is poisoning the population you are trying to save it for?	The Division of Drinking Water has worked closely with additional public health and water quality experts to produce a regulation that is protective of public health. The Pure Water program provides even higher levels of treatment than required by the Surface Water Augmentation regulations.
9	How is the City removing residual drugs such as hormones and narcotics from the recycled water?	The processes used for Pure Water include ozone/biological activated carbon, reverse osmosis membranes, and ultraviolet light with advanced oxidation. All of these processes combine to provide highly effective removal of contaminants of emerging concern (CEC). Please refer to explanation of removal of CEC's in the response to Question 1.
10	During the Title 22 Hearing, slides were presented showing contamination levels of *Giardia, Cryptosporidium* and virus. Are these representative of purification levels of all pathogens? Why show both *Giardia* and *Cryptosporidium* since they are protozoan parasites? Is there significance in presenting both?	*Giardia* and *Cryptosporidium* are both included in the Surface Water Augmentation (SWA) regulations because they both represent indicator organisms in drinking water regulations; specifically the Environmental Protection Agency's Long Term 2 Enhanced Surface Water Treatment Rule. It was important to the Division of Drinking Water that the SWA regulations take into account current requirements for treated drinking waters. The mechanism of inactivation for these two pathogens is different and they demonstrate significantly different resistances to various disinfectants, with *Cryptosporidium* being much more resistant to free chlorine than *Giardia,* for example. In addition, virus reduction is also regulated in drinking water. The removal and inactivation of viruses through the Pure Water processes was also described in the presentation.

Public Health Protection

	Comment or Question	Response
11	What is the current typical level of *Giardia* and *Cryptosporidium* at the input to the Miramar Water Treatment Plant? What output levels?	Both of the current imported water supplies (Colorado River and State Project) are monitored and *Cryptosporidium* is classified in "Bin 1" for the LT2ESWTR. Measured *Cryptosporidium* concentrations are < 0.075 oocysts/liter in Bin 1 and as such require the least amount of removal; 2 log (99%) reduction to meet the 10^{-4} annual risk of infection established by the Environmental Protection Agency. *Giardia* requires 3 log (99.9%) reduction. Compliance is determined based upon the treatment processes applied to the source water and surrogate parameters (e.g. turbidity) that are monitored in the treated water. *Giardia* and *Cryptosporidium* are not monitored in the finished water on a routine basis because of the difficulty of the analysis, the size of the sample that must be collected to attempt to measure them at the extremely low levels that they are present, and the time for the analysis to be conducted.
12	How effective is the Pure Water 5-stage purification at reducing levels of Constituents of Emerging Concern?	The purification process is highly effective at removing contaminants of emerging concern (CECs), as demonstrated in the Hearing presentation. A total of 116 CECs were sampled and of those, only 9 were detected at any measurable level. While each CEC had 16 to 18 sampling events, 7 of the CECs were only detected once and 2 were only detected twice. The concentrations of the detections were significantly below any health concern. For example, for one CEC that was a pharmaceutical (diclofenac – a non-steroidal anti-inflammatory drug used to treat mild pain such as arthritis) a person would have to have to drink 2 liters (about ½ a gallon) of water a day for 30 years to get one therapeutic dose.
13	How will the Pure Water Project protect against transmission of water borne illnesses such as typhoid, cholera, dysentery, and Hepetitis E?	These diseases are transmitted through bacterial and viral pathogens. The Pure Water Program is utilizing a multiple treatment barrier approach which is designed to physically remove or inactivate these and other types of pathogens. The barriers that are effective at removing bacteria and virus include ozone disinfection, membrane filtration (0.01 um pores), reverse osmosis, ultraviolet light disinfection with advanced oxidation, and free chlorine. A recent risk assessment of this treatment train demonstrated pathogen reduction in great excess of those needed for safe drinking water.
14	What is the expected Pure Water reduction of contagious virus like HIV and Ebola in the water supply?	HIV is a low risk outside the human body and studies have never isolated HIV in feces or urine. (Advisory Committee on Dangerous Pathogens HIV - the causative agent of AIDS and related conditions. Department of Health, 1990.) That said, HIV and other pathogens such as Ebola are effectively removed and inactivated by the processes used for Pure Water. Ebola virus, for example, is highly sensitive to disinfection by free chlorine, notwithstanding all the other removal and inactivation processes applied to produce Pure Water.
15	During the Title 22 Hearing, the chart on page 43, "Analysis of Purified Water Quality" shows water tests being conducted on contaminants from the Pure Water Demonstration Plant. Will this extensive level of testing be performed on the output water of the Pure Water Project?	The Pure Water Project will have extensive water monitoring and reporting requirements as a part of both the National Pollutant Discharge Elimination System permit and the Water Supply permit. It will include both analytical monitoring and process monitoring to ensure that the water meets the very strict Surface Water Augmentation standards established by the Division of Drinking Water (DDW) and other standards established by the Regional Water Quality Control Board (RWQCB). DDW and the RWQCB are currently in the process of finalizing those monitoring requirements. Section 15 of the Title 22 Engineering Report for the North City Water Project describes the overall monitoring plan.

Public Health Protection

	Comment or Question	Response
16	Does the California Department of Drinking Water, or other state agency, regularly update the list of drinking water contaminants to be tested?	The California State Water Resources Control Board, through the Division of Drinking Water, regularly updates primary and secondary maximum contaminant levels and notification levels for a suite of drinking water contaminants. In addition, the Division of Drinking Water implements the Environmental Protection Agency's Unregulated Contaminant Monitoring Rule, which is in its fourth version (UCMR4). The purpose of UCMR4 is to continue to monitor for contaminants that have a likelihood to find their way into water supplies at levels that may have adverse health impacts. As shown in the presentation, all of these contaminants, as well as others of potential concern, were monitored at the Pure Water Demonstration Facility.
17	What is the anticipated reduction level by the pure water process for one-cell organisms like ameoba, such as *Balamuthia Madrillaris,* a free living amoeba that is known to cause the deadly neurological condition known as granulomatous amoebic enciphalitis (GAE) first discovered in 1986 in the brain of a baboon that died in the San Diego Wild Animal Park? It is approximately 30 to 120 micrometres in diameter.	A single cell amoeba such as *Balamuthia Mandrillaris* with a size of 30 to 120 microns would be effectively removed by the membrane filtration (> 0.01 micron particle size removal) and reverse osmosis processes through size exclusion. The inactivation processes of ozone, UV and chlorine would also be highly effective on these organisms.
18	I am highly concerned, after watching the City's presentation, that not all pharmaceuticals, hormones, pesticides, insecticides and other chemicals will be removed to a safe level.	The purification process is highly effective at removing pharmaceuticals, hormones, pesticides, and insecticides, some of which are regulated and others which are contaminants of emerging concern (CECs). Section 9 of the Title 22 Engineering Report goes into great detail on the analytical results, including constituents that have primary and secondary maximum contaminant levels, notification levels, and are unregulated contaminants. All the results met drinking water standards for chemicals that are regulated, including pesticides and insecticides. A total of 116 CECs were sampled and of those, only 9 were detected at any measurable level. While each CEC had 16 to 18 sampling events, 7 of the CECs were only detected once and 2 were only detected twice. The concentrations of the detections were significantly below any health concern. For example, for one CEC that was a pharmaceutical (diclofenac – a non-steroidal anti-inflammatory drug used to treat mild pain such as arthritis) a person would have to have to drink 2 liters (about ½ a gallon) of water a day for 30 years to get one therapeutic dose.
19	At age 78, I am really concerned about the safety of future generations living in San Diego who will be drinking this untested "pure water." I beg you to avoid turning San Diego into another Flint Michigan.	The City conducted a demonstration project (2009-2013) that confirmed the purified water meets all federal and state drinking water standards. During a one-year testing period, more than 9,000 laboratory tests were conducted at the City's Pure Water Demonstration Facility on 342 chemical and microbial constituents and water quality parameters. A summary of the purified water quality and testing results can be found in Section 9 of the Title 22 Engineering Report online at: https://www.sandiego.gov/sites/default/files/ncpw_project_draft_title_22_engineering_report_0.pdf. To date, the City has performed more than 30,000 laboratory tests on the purified water. The multi-barrier water purification process has already been proven to protect public health. The Orange County Groundwater Replenishment System has successfully used a similar water purification process to San Diego since 2008. Other places in various stages of implementing projects include Singapore, Australia, Virginia, Texas and numerous other California cities. The Division of Drinking Water has also worked closely with additional public health and water quality experts to produce a regulation that is protective of public health. The Pure Water Program provides even higher levels of treatment than required by the Surface Water Augmentation regulations. These regulations also require a corrosion study which the City is currently performing to ensure that the water is not corrosive to the distribution system pipes, as was the case in Flint, Michigan.

Public Health Protection

	Comment or Question	Response
20	Will the water be as safe as the City claims? It has not been proven by laboratory testing on mice or other creatures.	The regulations that have been established for drinking water and which have been applied to this project are based upon health effects studies that include toxicological (laboratory animal) studies of adverse health effects. Pure Water surpasses the drinking water regulations established by the Environmental Protection Agency and the Division of Drinking Water, which are based upon the health effects data.
21	How does the City enumerate the bacteria that are in the treated water?	There are many ways to analyze for bacteria, protozoa and viruses in drinking water. The methods vary among organisms, but have been standardized to demonstrate compliance with drinking water requirements. Section 15 of the Title 22 Engineering Report lists the methods that are used to assess all of the water quality constituents. These analyses are performed by laboratories that have been certified under the Environmental Laboratory Accreditation Program.
22	How can the City be sure it has eliminated what it says it can?	The Environmental Protection Agency and the Division of Drinking Water have established regulations for contaminants that can be measured, and treatment techniques that have been demonstrated through research and testing to remove contaminants that cannot be measured on a regular basis. The effectiveness of treatment techniques is measured through operating performance criteria and surrogate compounds. Both of these approaches are used in implementing the Pure Water processes and are detailed in Section 13 of the Title 22 Engineering Report.
23	How does the City identify the bacteria that are still present?	The Environmental Protection Agency and the Division of Drinking Water have established regulations for contaminants that can be measured, and treatment techniques that have been demonstrated through research and testing to remove contaminants that cannot be measured on a regular basis. The effectiveness of treatment techniques are measured through operating performance criteria and surrogate compounds. Both of these approaches are used in implementing the Pure Water processes and are detailed in Section 13 of the Title 22 Engineering Report.
24	How can the City verify that the chlorine treatment will be enough to dispose of contaminants, both present and future?	Chlorine treatment is not the only treatment process. In addition to the removal processes through primary, secondary and tertiary filtration at the North City Water Reclamation Plant, the Pure Water Facility includes ozone/biological activated carbon, membrane filtration, reverse osmosis, ultraviolet light with advanced oxidation (UV/AOP), and finally free chlorine in the pipeline to Miramar Reservoir. Filtration for removal is provided with granular media filtration, biological activated carbon, membrane filtration and reverse osmosis. Disinfection is achieved with ozone, UV/AOP and chlorine. The combination of all of these processes provides an extremely robust system that can address all pathogens and chemical contaminants.
25	PFOA and PFOS have long term affects which can be highly detrimental for a period of years, causing disease. How is the public ensured that these have been tested adequately?	PFOA and PFOS were sampled in the Pure Water Demonstration Facility finished water and all samples were non-detect.

Public Health Protection

	Comment or Question	Response
26	Is the City testing for all of the potential contaminants that come from the primary industries in San Diego, particularly pharmaceuticals?	Just like we protect the water quality in a watershed, the City has a source control program for the sewersheds. The City administers and enforces a control program for the entire wastewater system to protect the system and wastewater treatment plants from unwanted discharges such as waste from the pharmaceutical manufacturers and other categorical industrial dischargers. The EPA regulates effluents from pharmaceutical manufacturing through federal pretreatment standards, and the City's source control program complies with the federal requirements. This program was enhanced beyond federal and state requirements to meet specific needs of the ocean discharge permit for the Point Loma Wastewater treatment plant. The control program includes an extensive monitoring program, an assessment of the fate of specific chemicals in the collection system and through treatment, an inventory of constituents that may be discharged into the collection system, and an outreach and enforcement program to minimize chemical discharges.
27	How can the City extract hormones from the sewer water?	The purification process is highly effective at removing pharmaceuticals, hormones, pesticides, and insecticides, some which are regulated and others which are contaminants of emerging concern (CECs). Section 9 of the Title 22 Engineering Report goes into great detail on the analytical results, including constituents that have primary and secondary maximum contaminant levels, notification levels, and are unregulated contaminants. A total of 116 CECs were sampled – some of which are hormones - and of those, only 9 were detected at any measurable level. While each CEC had 16 to 18 sampling events, 7 of the CECs were only detected once and 2 were only detected twice. The concentrations of the detections were significantly below any health concern. For example, for one CEC that was a pharmaceutical (diclofenac – a non-steroidal anti-inflammatory drug used to treat mild pain such as arthritis) a person would have to have to drink 2 liters (about ½ a gallon) of water a day for 30 years to get one therapeutic dose.
28	Have any studies been performed with pregnant women and fetuses?	The Division of Drinking Water, as a part of the State Water Resource Control Board, prepared a regulation for surface water augmentation of drinking water that is based upon drinking water regulations. Drinking water regulations, in turn, are based upon health studies in human populations (epidemiological studies) and laboratory animals (toxicological studies). The regulations were developed with the support of national and international experts in the fields of public health, water, and sanitation.
29	How do the numbers (log removal of pathogens through treatment) that the residents receive in their water have at their homes now compare with the 10 log removal values that is on the North City Pure Water project?	The pathogen log removals for the Pure Water Program have been determined and demonstrated, with a significant factor of safety, to achieve the Environmental Protection Agency's 1 in 10,000 annual risk of infection. The required log removals with imported water are lower for the City's existing drinking water treatment plants, because of the initial quality of the imported source compared to wastewater. That said, both the existing drinking water supply and Pure Water meet all of the Division of Drinking Water and Environmental Protection Agency's drinking water quality requirements. Of note, the City's Miramar Water Treatment Plant was recently awarded the Partnership for Safe Water's President's Award. This award recognizes utilities who demonstrate outstanding commitment to delivering superior quality drinking water to customers, even beyond regulatory requirements.

Public Health Protection

	Comment or Question	Response
30	I believe that before this water is put into Miramar Lake for human consumption, lab tests should be carried out by a reputable university. Testing the safety of this water on mammals which is normally done for any product slated for human consumption.	The regulations that have been established for drinking water and which have been applied to this project are based upon health effects studies that include toxicological (laboratory animal) studies of adverse health effects. Pure Water surpasses the drinking water regulations established by the Environmental Protection Agency and the Division of Drinking Water, which are based upon the health effects data. The analyses were performed by laboratories that are certified by Environmental Laboratory Accreditation Program (ELAP). These include the City lab and, in some cases, for contaminants of emerging concern and other non-regulated chemicals, independent laboratories. The ELAP certification is very strict and ensures reproducible results. Notably, many university laboratories are not ELAP certified.
31	Since waterfowl play a role in flu and potential pandemic development, the exposure of higher concentration of treated wastewater in the proposed reservoir requires attention, as well as in a reservoir that is larger.	The highly treated water released to Miramar Reservoir will surpass all drinking water requirements and will be treated again at the Miramar Water Treatment Plant before distribution to customers. The extent to which waterfowl at Miramar Reservoir play a role in avian-transmitted flu is uncertain, but is unaffected by the purified water discharge. Chlorination has been shown to effectively inactivate avian viruses.
32	Having a tiny water body dispenses with any pretense of having a raw water reservoir that buffers recycled municipal wastewater that is added to it; buffering discharges now happens in rivers, lakes and groundwater aquifers. The tiny reservoir is surrounded by close subdivision development. A larger and more remote or development-separated reservoir should be used for surface water augmentation.	The California Division of Drinking Water had extensive discussions with water quality and limnological experts prior to finalizing their Surface Water Augmentation (SWA) requirements. The requirements account for different sized reservoirs in terms of dilution, residence time, and consequent upstream treatment requirements (more upstream treatment for smaller reservoirs). The Phase 1 project facilities surpass the SWA requirements, and provide a higher degree of the additional treatment that is required for release into Miramar Reservoir as compared to a larger reservoir such as San Vicente. In addition, Miramar Reservoir provides a very critical "decoupling" approach to allow the Miramar Water Treatment Plant to continue to treat and deliver drinking water directly from imported sources - bypassing the Reservoir - if there were a concern in the quality of the water from Miramar Reservoir.
33	There is also concern about the transport of recycled municipal wastewater in pipes, because film on the inside of purple pipes has been found to generate antibiotic resistant organisms and genetic material.	Similar concerns were raised in Flagstaff, AZ in 2013 when antibiotic-resistant genetic material was found in their recycled wastewater; however, an expert panel was formed in 2013 and determined that the presence of this material did not indicate that the water was unsafe. Recently, the expert panel was reconvened in 2017 and confirmed their 2013 findings that the water is safe. It is important to note that the Pure Water that will be delivered to Miramar Reservoir is much higher quality than recycled water used for non-potable uses, such as irrigation as was the concern in Flagstaff, AZ. The Pure Water that will be delivered to Miramar Reservoir will undergo multiple advanced treatment steps to ensure the Pure Water meets all drinking water quality standards before it is discharged to the reservoir.
34	The project needs to anticipate that drinking water pipelines that become contaminated may need to be replaced. Replacement was necessary in Walkerton, Canada after e-coli that could have been prevented from entering the town's water supply, harmed a number of people and made the distribution system unusable and unsuitable for potable water.	The e-coli outbreak in Walkerton, Ontario was the result of a failure of the treatment system for a groundwater well that had become contaminated as a result of surface water infiltration into the shallow aquifer together with a lack of treatment (discontinuation or extremely low levels of chlorination). Once adequate chlorination was reinstated the outbreak ended using the existing infrastructure, together with recommendations for improved operations. Strict operations and water quality monitoring is required by the California Division of Drinking Water for the Pure Water facilities. The treatment processes for Pure Water have multiple barriers with much higher levels of treatment than chlorine alone, although a chlorine residual is required and will be maintained in the Pure Water pipeline that delivers purified water to Miramar Reservoir. E-coli is easily inactivated by free chlorine. Once the water is released to Miramar Reservoir, it will be treated again at the Miramar Water Treatment Plant before delivering drinking water to customers.