Appendix L

Well Monitoring Plan

PennEast Pipeline Company, LLC

PennEast Pipeline Project

Well Monitoring Plan

FERC Docket No. CP15-558-000

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1.0 Introduction

PennEast Pipeline Company, LLC (PennEast) is seeking authorization from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act to implement the PennEast Pipeline Project (Project) to provide a direct and flexible path for transporting natural gas produced in the Marcellus Shale production region in northern Pennsylvania to growing natural gas markets in New Jersey, eastern and southeastern Pennsylvania and surrounding states. The project is designed to provide approximately 1.1 million dekatherms per day (MMDth/d) of year-round transportation service. The project will include a 36-inch diameter, 114-mile mainline pipeline, extending from Luzerne County, Pennsylvania, to Mercer County, New Jersey. The Project will extend from various receipt point interconnections in the eastern Marcellus region, to various delivery point interconnections in the heart of major northeastern natural gas-consuming markets, including interconnections with UGI Central Penn Gas, Inc. (Blue Mountain) in Carbon County, Pennsylvania, UGI Utilities, Inc. and Columbia Gas Transmission, LLC in Northampton County, Pennsylvania, and Elizabethtown Gas, NRG REMA, LLC, Texas Eastern Transmission, LP (Texas Eastern) and Algonquin Gas Transmission, LLC (Algonquin), all in Hunterdon County, New Jersey. The terminus of the proposed PennEast system will be located at a delivery point with Transco in Mercer County, New Jersey.
This Well Monitoring Plan has been prepared to outline the procedures for pre- and post-construction monitoring of all identified wells and springs within 150 feet (500 feet within Karst Terrain) of the proposed construction work space.

1.1 Objective

It is noted that many of the wells and springs within the New Jersey and Pennsylvania regions are undocumented and maybe utilized for domestic, agriculture and industrial use. Therefore, historically, the wells or springs are not registered and readily discernable through available datasets. Notwithstanding, PennEast land agents have in the past and continue to informally discuss with homeowners if wells exist to inventory the resources of wells within the influence of the planned activities. This Well Monitoring Plan is intended to identify protocols and outline procedures for pre- and post- construction monitoring of wells and springs within 150 feet (500 feet within Karst Terrain) of the construction work space that could be impacted by Project construction activities such as blasting, or in karst sensitive areas. Monitoring will include yield and water quality testing for all identified water supply wells and potable springs located within 150 feet (500 feet within Karst Terrain) of the construction work space. This information will be used to document the water supply's conditions before the pipeline work begins and after the Project is complete. This Plan further identifies PennEast's plan to repair or replace private water supply sources if they become impacted by Project-related construction activities. Recommendations presented herein are pursuant to regulatory frameworks outlined by the FERC, as well as testing guidance provided by the Pennsylvania Department of Environmental Protection (PADEP) and New Jersey Department of Environmental Protection (NJDEP).

1.2 Regulatory Framework

The following is a summary of applicable regulatory guidelines in determining the appropriate distances and testing parameters for private and public water supply wells or springs.

1.2.1 FERC's Guidance Manual for Environmental Report Preparation (FERC, 2002)

Section 2.1.1, Public and Private Water Supply Wells, of FERC's Guidance Manual for Environmental Report Preparation states:

> Identify by milepost all drinking water supply wells, including private, community, municipal/public wells, and springs within 150 feet (as requested by FERC 500 feet within Karst Terrain) of any area that would be disturbed by construction. This includes the construction right-of-way (ROW), extra work areas, new access roads, pipe storage and contractor yards, and sites for new or modified aboveground facilities (see Table 2.1-1 for an example). Supply well and spring information can generally be obtained from the county and state Board of Health Departments which compiles information on drinking water supplies and springs. Information may be available from maps, in computer databases, in Board of Health reports, or from field surveys.

In addition, Section 2.1.2, Groundwater Impact Mitigation, of the FERC Guidance Manual dictates:

> Identify measures for minimizing and mitigating impact on groundwater by describing the use of special blasting techniques, trench breakers, dewatering methods, and restrictions on refueling and storage of hazardous substances (generally prohibit refueling and storage of hazardous materials within a 200-foot radius of private wells, and 400-foot radius of community and municipal wells). Include a plan for monitoring groundwater quality and yield for public and private supply wells, with the owner's permission, before and after construction to determine whether water supplies have been affected by pipeline construction activities. Also indicate what types of mitigation measures would be undertaken to ensure that the water supply is returned to its former capacity in the event of damage resulting from construction (e.g., providing temporary sources of potable water, restoration, repair, or replacement or water supplies).

Finally, Section 6.2, Blasting, of the FERC's Guidance Manual states:

> Identify by facility and milepost all locations where blasting may be required using sources such as surficial geology maps, NRCS soil surveys, and field surveys. Analyze potential impacts on water wells, springs, wetlands, slopes, structures, and adjacent pipelines. Describe the mitigative measures that would be used to control adverse impacts, including measures to minimize vibrations and flyrock. Also discuss measures that address safety concerns. Specifically describe the procedures for pre- and post-blast inspections of structures and wells, as well as any monitoring that would be done during blasting.

1.2.2 Pennsylvania Department of Environmental Protection

PADEP does not regulate private wells (PADEP, 2015). However, PADEP' s Bureau of Safe Drinking Water offers general information on private water well management including well contaminants of concern, water testing guidelines, and PA certified drinking water laboratories (PADEP 2015).

In addition, PADEP offers regulatory guidance on monitoring public water supply wells within the proximity of construction.

1.2.3 New Jersey Department of Environmental Protection

NJDEP offers guidance on private well testing through the Division of Water Supply and Geoscience's Private Well Testing Act Regulations, N.J.A.C. 7:9E et seq (NJ DEP, 2008). These regulations establish water test parameters and requirements for the collection, analysis, and submittal of test results and establish procedures and requirements for maintaining the confidentiality of any information submitted to the Department or other government agencies pursuant to the Private Well Testing Act (PWTA). The Division of Water Supply and Geoscience's provides a list of required parameters for private well testing by County (NJDEP, 2015a), as illustrated below. In addition, it is required that the NJ Private Well Test Reporting Form be completed exclusively by laboratories reporting well test results in accordance with PWTA Regulations N.J.A.C 7:9E (NJDEP, 2015b).

List of Required Parameters for Private Well Testing

	Total Coliform	*Fecal Coliform or E.coli	Nitrate	Iron	Manganese	pH	VOCs	Lead	Arsenic	Mercury	Gross Alpha Particle Activity
Atlantic	X	X	X	X	X	X	X	X		X	2
Bergen	X	X	X	X	X	X	X	X	X		
Burlington	X	X	X	X	X	X	X	X		X	2
Camden	X	X	X	X	X	X	X	X		X	2
Cape May	X	X	X	X	X	X	X	X		X	3
Cumberland	X	X	X	X	X	X	X	X		X	1
Essex	X	X	X	X	X	X	X	X	X		
Gloucester	X	X	X	X	X	X	X	X		X	1
Hudson	X	X	X	X	X	X	X	X	X		
Hunterdon	X	X	X	X	X	X	X	X	X		3
Mercer	X	X	X	X	X	X	X	X	X		3
Middlesex	X	X	X	X	X	X	X	X	X		3
Monmouth	X	X	X	X	X	X	X	X		X	3
Morris	X	X	X	X	X	X	X	X	X		
Ocean	X	X	X	X	X	X	X	X		X	3
Passaic	X	X	X	X	X	X	X	X	X		
Salem	X	X	X	X	X	X	X	X		X	2
Somerset	X	X	X	X	X	X	X	X	X		
Sussex	X	X	X	X	X	X	X	X	4		
Union	X	X	X	X	X	X	X	X	X		
Warren	X	X	X	X	X	X	X	X	4		

*Fecal Coliform or E. Coli testing is required only if a sample tests positive for total coliform. See N.J.A.C. 7:9E-2.1(a)2.

1 = testing required starting March 15, 2003
2 = testing required starting September 16, 2003
3 = testing required starting March 16, 2004
4 = testing required starting March 14, 2008

In addition, NJDEP offers regulatory guidance on monitoring public water supply wells within the proximity of construction.

1.2.3 Regulatory Conclusions

In summary, FERC maintains the most stringent regulations for private and public water supply well testing related to pre- and post-construction monitoring. As a result, PennEast will perform monitoring for well yield and water quality before and after construction consistent with FERC guidelines. Monitoring methodologies should remain stagnant throughout the duration of the Project and in all counties the Project intersects.

2.0 Well and Spring Monitoring Protocols and Procedures

All identified drinking water supply wells, including private, community, municipal/public wells, and springs within 150 feet (500 feet within Karst Terrain) of any area that would be disturbed by construction will be identified by milepost. General information to be collected prior to well or spring monitoring will include both historical and current well/spring conditions such as the well installer, location of the well (address and GPS coordinates), date of construction of the well, previously reported yield, previously reported well depth, type of pump, depth of pump, depth, diameter and type of well casing, water treatment systems in use, holding tanks, and the flow rate in gallons per minute of the existing equipment, where applicable. A physical review of the general site layout will be conducted, noting possible sources of contamination (fuel tanks, workshops, barns, dumps, etc.). Photographs of the current conditions of the well or spring and water system should collected. Photos will include the well casing, spring house, pressure tank, treatment units, pump, and surrounding area, if possible. Arrangements for a sampling date and time will be made with the homeowner.

2.1 Private Water Supply Wells

Pursuant to FERC's *Guidance Manual for Environmental Report Preparation,* PennEast will perform pre- and post-construction monitoring for water quality and yield for private wells within 150 feet (500 feet within Karst Terrain) of the proposed construction work area. This includes the construction ROW, extra work areas, new access roads, pipe storage and contractor yards, and sites for new or modified aboveground facilities. Monitoring would include water quantity and quality parameters including water column height, flow rate of existing equipment, water column drawdown, rebound time, volatile organic compounds, total petroleum hydrocarbons, bacteria, and compounds in nearby construction and in blasting (if blasted will occur nearby). If a well has any treatment systems such as softeners or filtration, samples should be collected from raw water prior to treatment. All New Jersey water supply well testing plans should comply with NJDEP's Division of Water Supply and Geoscience's Private Well Testing Act Regulations (2008).

2.2 Public Water Supply Wells

PennEast would conduct additional monitoring of public wells to determine whether water supplies have been affected by pipeline construction. Public wells within 150-feet (500 feet within Karst Terrain) of the Project work area would be tested before and after construction. Baseline data would be established during pre-construction monitoring events and be compared to data retrieved during post-construction testing. Monitoring of public wells would occur twice per day during construction activities.

2.3 Karst Terrain

In karst-prone areas, PennEast will offer landowners within 500 feet of the construction workspace and within areas of documented karst terrain both pre- and post-construction testing of water wells. It is anticipated that the program will include testing of yield and turbidity parameters. For any significant differences in the well yield between pre- and post-construction sampling that cannot be attributed to naturally occurring conditions, such as seasonal groundwater level fluctuations, PennEast will compensate the landowner for the installation of a new well or otherwise arrange for provision of suitable water supplies. A baseline sampling will be conducted to establish a baseline turbidity level for each well. If construction activities affect existing subsurface hydrogeology and groundwater flow in the karst areas, water samples will be taken from these drinking water wells and tested for turbidity on a daily basis until the turbidity levels return to the baseline levels.

PennEast's monitoring program for mapped wells and springs shall involve the establishment of a baseline turbidity level in water resource areas that are within a 500 foot radius of planned activities with potential to

affect documented karst terrain. This monitoring program will allow PennEast to determine if sediments or runoff directly related to construction activities have entered the well or spring.
Prior to the start of construction activities near these documented areas, baseline turbidity levels will be established at the well or spring to be monitored by collecting samples at six hour intervals over a 24 hour period. Water samples will be analyzed for turbidity using a portable turbidity meter. Turbidity readings, water levels, rainfall rates, seasonal and environmental changes, and water appearance will be recorded during every sampling event. Since groundwater flow may be either conduit or diffuse flow and related to precipitation, rainfall rates will be recorded from the nearest weather station with available data. Each turbidity measuring unit will be calibrated per manufacturer recommendations prior to use.

If an inadvertent release is reported, the water resource areas will be sampled twice per day, both at morning and afternoon intervals, until the turbidity returns to background levels or until the turbidity levels are within acceptable criteria as per State and Federal requirements.

Buffers of 100 feet around documented karst surface expressions and wells and springs recharging karst hydrology will be maintained between all work areas and the karst-related features. Surface water control measures including, but not limited to, diversion, detention, or collection and transportation will be implemented to minimize construction-influenced surface water from entering into the karst-related features.

2.4 Well Yield Testing Procedures

Pre- and post-construction tests should be conducted in similar fashions (i.e. same pumping rate, duration, equipment, and location in the plumbing system – spigot, etc.) to help eliminate uncertainty in calculations. Prior to testing, water levels in the well should be observed for 15 minutes to determine if the well is recovering from residential use. If the well is rising significantly, the pre-test period should be extended. If the level of water in the well is static, a minimum pumping duration of one hour is suggested, with recovery observations of 30 minutes or more if the well recovers slowly.

A short duration pump test is conducted by activating the submersible pump in the well. The water discharge should consist of a 100-foot long hose connected to the base of the pressure tank and discharged at the far end of the property. A simple and accurate method of approximating the pumping rate is to observe the time required to fill a container of known volume. A visual assessment can be made of the clarity of the water and the presence or absence of any turbidity.

As an alternate method for determining pumping rate, a water flow meter should be connected to the discharge end of the 100-foot hose. The totalizer on the flow-meter should be recorded periodically through the test to track for potential variations in pumping rates. The discharge rate can be calculated by the following equation:

(Total Volume of Water Discharged) / (Duration of Drawdown) = Discharge Rate

The drawdown rate of the well should be measured by utilizing a water level meter and taking water level measurements at intervals ranging from 15 seconds to 1 minute. Once pumping stops, the recovery rate of the well should be tracked and recorded.

The Approximate Yield of a well is utilized to incorporate the well's drawdown rate in the well yield calculation. Approximate yield can indicate the well's ability to supply water and is defined as the approximate rate, in gallons per minute (gpm), at which groundwater enters into the well bore, for the duration of the drawdown test. The total volume of water discharged during the drawdown portion of the pump test must be measured in gallons as part of this calculation.

Before starting to pump, determine the initial water depth. The height of the withdrawn column of water is approximated by determining the difference between the initial water depth and the lowest recorded depth during the drawdown period. This will be used in calculating the volume of stored water within the portion of the well bore to be withdrawn or pumped. This volume can be approximated using the general equation for the volume of a cylinder:

$$\text{Volume} = \pi * (\text{radius of well})^2 * (\text{height of withdrawn column of water})$$

This equation results in cubic feet, use a conversion factor of one cubic foot to 7.48052 gallons to convert to gallons.

Next, subtract the volume of stored water from the total volume of water discharged during the pumping test. This results in the total volume of water, in gallons, that entered the well bore during the drawdown period. The equation can be written as follows:

(Volume Discharged) – (Volume Stored) = Volume of Water Entering Well

The final calculation to determine the approximate yield rate. The volume of water that entered into the well during drawdown, in gallons, is divided by the total duration of drawdown, in minutes:

(Volume of Water Entering Well) / (Duration of Drawdown) = Approximate Yield

After the test has been completed, the pump should be shut off and the well should be tracked to determine the length of time needed for recharge. Recharge is considered finished when the water levels return to the static water level observed before pumping began. The difference in water level from the initial static water level is called residual drawdown.

The results of this test may vary based on season, recent weather conditions, and number of competing wells in the area.

If water level measurements cannot be taken safely (i.e. buried well heads, tight annular spaces, etc.), other information may help in determining the well's ability to produce water at the observed pumping rate. Recording the frequency and duration of the pump cycles can provide some proxy information on how hard the pump/well has to work to provide that flow rate. Ensure the equipment associated with the well (i.e. pump, motor, storage, etc.) hasn't changed between tests during these instances.

Any changes in weather events and/or water levels in surrounding aquifers should be noted. USGS monitoring wells located in adjacent areas will provide data on water levels in surficial and bedrock aquifers. In addition, public and private weather stations can provide data on the magnitude of storm events.

2.5 Spring Yield Testing Procedures

Pre- and post-construction tests will be conducted in similar fashions (i.e. same pumping rate, duration, and equipment, etc.) to help eliminate uncertainty in calculations. If the spring has an outflow pipe or discharge, a measurement device such as a V-notch weir or graduated bucket and stopwatch should be used to gauge flow. Several measurements are recommended to guarantee measurement accuracy. If no outflow is present, pumping from a holding tank may be necessary. In this case, the dimensions and capacity of the hold tank would be determined prior to pumping. The tank should be pumped out to lower the level by approximately

25%, and then recovery in the tank can be gauged. The pumping rate and total water removed should be recorded using a totalizing flow meter. Gauging recovery can be accomplished by using a pressure transducer, or if adequate access is provided, an electronic water level meter can be used.

2.6 Water Quality Testing Procedures

The PADEP and NJDEP provide Maximum Contaminant Level (MCL) for analytes which will be analyzed. In addition, PADEP and NJDEP maintains a list of certified drinking water laboratories to perform contaminant testing

Pre- and post-construction sampling should be conducted in similar fashions (i.e. location in the plumbing system – spigot, etc.) to help eliminate uncertainty. Appropriate methods and quality –assurance measures will be in place to ensure the water samples collected are representative of the water source. A pre-treatment water sample should be collected. All attempts to remove at least one volume of water from the well should be made prior to sampling. If sampling from a spring with no outflow, sampling should occur prior to pumping out the tank. Water should be reasonably clear and sediment free before any sampling occurs.

Multiple water samples from each well or spring will be collected in laboratory-provided, pre-preserved, sterile bottles. Each sample will be clearly identified with site (residence), location, sample number – if more than one well or spring, date, time sampled, sampler name, and other pertinent information and accompanied by a chain of custody form. Bottles should be placed immediately into an iced cooler for storage and transport to the testing lab within the recommended holding time. Water sample collection will be conducted using proper collection and handling techniques to eliminate cross-contamination. Testing parameters for each sample collected during pre- and post-construction monitoring for the Project, and the associated MCL in parentheses, include:

- Coliform Bacteria, including fecal coliform is sample tests positive for total coliform (any positive result is unsatisfactory);
- Heavy Metals, including Arsenic (PA 0.010 mg/L or 10 ppb, NJ 0.005 mg/l or 5ppb), Mercury (0.002 mg/L or 2 ppb) and
  Lead (0,015 mg/);
- Nitrate (10 mg/L as N) and Nitrite (1 mg/L as N);
- Iron (0.3 mg/L);
- Manganese (PA 0.3 mg/L, NJ 0.05 mg/L);
- Iron plus manganese (0.5 mg/L)
- Sodium (no designated limit);
- Gross Alpha Particle Activity (15 picocuries/L);
- Uranium 234, 235 and 238 (0.03 mg/L) (for samples collected from the Reading Prong (Northampton County, PA) and the Jurassic/Triassic (Hunterdon and Mercer Counties, NJ) sedimentary rocks derived from those lithologies, including the Stockton, Lockatong, and Passaic Formations area of the alignment only);
- pH (no designated limit, suggested level of 6.5 to 8.5);
- Hardness (no designated limit);
- Alkalinity (no designated limit);
- Turbidity (PA 1 NTU, or 5 NTU depending on filtration system NJ 0.3-1 NTU);
- Volatile Organic Compounds (VOCs) (varies based upon specific VOC);
- Total Petroleum Hydrocarbons (TPH) (no designated limit, recommendations for specific TPH compounds);
- Compounds used in blasting (if blasting has occurred nearby) (varies based upon specific compound)

Water quality samples will be sent to a certified drinking water laboratory for contaminant testing. Baseline data will be established during pre-construction monitoring events and be compared to data retrieved during post-construction testing to determine if the well or spring as been impacted by construction activities.

3.0 Impacted Well and Spring Procedures

In the event that any water supply's quantity or quality is impacted during construction, it is recommended that PennEast provide an alternate water supply source or pay damages to the landowner for a new, analogous well. PennEast would file a report with the Secretary within 30 days of completion of construction detailing landowner complaints received regarding well quality and yield. Reports would further describe how those complaints were addressed and/or resolved.

Should a release occur to a spring, the installation of soil erosion and sediment control measures such as silt fencing, sand bags, core logs, or turbidity barrier may be implemented so as to contain the release of drilling fluid stemming from the spring. Subsequently, PennEast may remove the contained drilling fluid using vacuum truck or pump and use hand tools to collect sediment from the drill fluid.

4.0 References

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Attachment 1

Well Monitoring Data Form

Well Testing Data Form

1) General well information to collect before testing
    a. Well Installer:____
    b. Location of Well: ____
    ____
    c. Date of Construction of the Well: ____
    d. Method of Construction: ____
    ____
    ____
    e. Yield (previously reported): ____
    f. Depth of Well (previously reported): ____
    g. Type of Pump: ____
    h. Depth of Pump: ____
    i. Depth and Type of Casing: ____
    ____
    ____
    j. Water Treatment Systems: ____
    ____
    ____
    k. Flow rate of existing equipment (gpm): ____

2) Measurements to collect/calculate during testing
    a. Discharge rate: ___________________ (gpm)
        i. Total volume of water discharged: ___________________ (gallons)
        ii. Duration of drawdown: ___________________ (minutes)
    b. Volume of stored water: ___________________ (gallons)
        i. Radius of well: ___________________ (feet)
        ii. Height of withdrawn column of water: ___________________ (feet)
            1. Initial water depth: ___________________ (feet)
            2. Lowest depth during drawdown period: ___________________ (feet)
    c. Volume of water entering well: ___________________ (gallons)
        i. Total volume of water discharged (recorded above) : _______________ (gallons)
        ii. Volume of stored water (calculated above) : ___________________ (gallons)
    d. Approximate yield: ___________________ (gpm)
        i. Volume of water entering well (calculated above) : _________________ (gallons)
        ii. Duration of drawdown (recorded above) : ___________________ (minutes)
    e. Water column drawdown: ___________________ (feet)
    f. Specific Capacity: ___________________ (gpm per foot of drawdown)
    g. Rebound/recovery time: ___________________ (minutes)

3) Analytes for which to test in well water sample

Analyte	MCL (1)(2)	Concerns
Coliform Bacteria	Any positive result is unsatisfactory	Indicator of possible disease causing contamination, e.g. Gastro-intestinal illness
Fecal Coliform or E. coli	Only necessary if sample tests positive for total coliform	
Arsenic	PA 0.010 mg/L or 10 ppb NJ 0.005 mg/l or 5ppb	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer
Mercury	0.002 mg/L or 2 ppb	Kidney damage
Lead	0.015 mg/L	Brain, nerve and kidney damage (especially in children)
Nitrate	10 mg/L as N	Methemoglobinemia ("blue baby syndrome")
Nitrite	1 mg/L as N	Methemoglobinemia ("blue baby syndrome")
Iron	0.3 mg/L	Rust-colored staining of fixtures or clothes
Manganese	PA 0.3 mg/L, NJ 0.05 mg/L	Black staining of fixtures or clothes
Iron plus manganese	0.5 mg/L	Rusty or black staining of fixtures or clothes
Sodium	No designated limit (3)	Effects on individuals with high blood pressure
Gross Alpha Particle Activity	15 picocuries/L	Increased risk of cancer
Uranium (234, 235, 238)	0.03 mg/l (only analyzed in the Reading Prong (Highland/South Mountain) area of the alignment	Increased risk of kidney disease. Increased lifetime risk of cancer.
pH	No designated limit, suggested level of 6.5-8.5	Pipe corrosion (lead and copper), metallic-bitter taste
Hardness	No designated limit	Mineral and soap deposits, detergents are less effective
Alkalinity	No designated limit	Inhibits chlorine effectiveness, metallic-bitter taste
Turbidity	PA Systems that use conventional or direct filtration: 1NTU Systems that use filtration other than the conventional or direct filtration:5 NTU NJ 0.3-1 NTU	Cloudy, "piggybacking" of contaminants, interferes with chlorine and UV-light disinfection
Volatile Organic Compounds (VOCs)	Varies based upon specific VOC	Varies based upon specific VOC
Total Petroleum Hydrocarbons (TPH)	No designated limit, recommendations for specific TPH compounds	Varies based upon specific compound, generally affects nervous system
Compounds used in blasting (if blasting has occurred nearby)		Varies based upon specific compound
(1) MCL = maximum contaminant level, or the highest level of a contaminant that is allowed in drinking water. The MCLs listed are based upon EPA regulations for drinking water.		
(2) mg/L = milligram per liter (parts per million); NTU = Nephelometric Turbidity Units.		
(3) Water containing more than 20 mg/l of sodium should not be used for drinking by people on severely		

Analyte	MCL (1)(2)	Concerns
restricted sodium diets. Water containing more than 270 mg/l of sodium should not be used by people on moderately restricted sodium diets.		

4) Recommended tests for specific situations

Conditions or Nearby Activities:	Test for:
Recurring gastro-intestinal illness[1]	Coliform bacteria, e-coli
Household plumbing contains lead (older homes)	pH, lead, copper
Radon in indoor air or region is radon rich	Radon
Corrosion of pipes, plumbing	pH, lead, copper
Nearby areas of intensive agriculture	Nitrate, pesticides, arsenic, coliform bacteria
Coal or other mining operations nearby	Metals, pH
Gas drilling operations nearby	Sodium, chloride, barium, strontium
Dump, junkyard, landfill, factory, gas station, or dry-cleaning operation nearby	Volatile organic compounds, total dissolved solids, pH, sulfate, chloride, metals
Odor of gasoline or fuel oil, and near gas station or buried fuel tanks	Volatile organic compounds
Objectionable taste or smell	Hydrogen sulfide, pH, metals
Stained plumbing fixtures, toilet tanks or laundry	Iron, copper, manganese, hardness
Salty taste and seawater, or a heavily salted roadway nearby	Sodium, chloride, total dissolved solids
Scaly residues, soaps don't lather	Hardness
Rapid wear of water treatment equipment	pH
Water softener needed to treat hardness	Hardness, manganese, iron
Water appears cloudy, frothy, or colored	Color, detergents, turbidity, total dissolved solids
Reddish-brown films on fixtures or toilet tanks	Iron bacteria, iron, manganese
[1] Individuals with symptoms of gastro-intestinal illness should seek the attention of a medical physician.	