



# **ARSENIC COMPLIANCE PLAN**

February 2005

## **Introduction and Summary**

### **Introduction**

The Truckee Meadows Water Authority (TMWA) Arsenic Compliance Plan (ACP) was developed to ensure compliance with the USEPA (as adopted by the State of Nevada) Arsenic Rule. Completion of the elements of this plan will ensure that all TMWA water customers will be served water that meets the new arsenic regulation.

### **Summary**

TMWA serves drinking water to the cities of Reno and Sparks, and portions of Washoe County. The water system utilizes both treated surface water from the Truckee River via two water treatment plants (Chalk Bluff and Glendale) and a system of 30 wells scattered throughout the service area. The surface water is used throughout the year, while the wells are used for summer peaking and emergency supply. The wells generally supply 15-percent of the total supply in a normal year and up to 25-percent during a drought year. The arsenic concentration in treated Truckee River water is typically below 2 ppb, and the arsenic concentration in the wells varies from below 10-ppb to as high as 88 ppb. Three of the wells with the highest arsenic concentrations (Terminal Way, Poplar No. 1 and Pezzi) are currently piped to the Glendale Water Treatment Plant (WTP) for blending with Truckee River water and treatment. The location of the wells and treatment facilities are shown on Figure 1: TMWA Well and Treatment Facilities Map.

## **Facilities Operation and Improvements**

Treated surface water from the Chalk Bluff and Glendale WTP's is consistently below 2 ppb. Of the 30 wells supplying water to the entire service area, 3 wells exceed the current standard of 50-ppb and are currently piped to and treated at the Glendale WTP. An additional 10 wells are near or above the regulatory

requirement of 10 ppb. Table 1 shows the 13 TMWA wells with arsenic above or near 10 ppb which require compliance with the arsenic regulation, their respective arsenic concentrations, and the proposed action for each.

Table 1  
Summary of TMWA Wells Requiring Arsenic Compliance

<b><u>Well Name</u></b>	<b><u>Average Arsenic Value (ppb)</u></b>	<b><u>Proposed Compliance Action</u></b>
Terminal Way	88	Continue Blending and Treatment at the Glendale Water Treatment Plant
Poplar No. 1	85	Continue Blending and Treatment at the Glendale Water Treatment Plant
Pezzi	72	Continue Blending and Treatment at the Glendale Water Treatment Plant
Mill Street	37	Pipe to and Blend/Treat at the Glendale Water Treatment Plant
Greg Street	19	Pipe to and Blend/Treat at the Glendale Water Treatment Plant
Corbett	17	Pipe to and Blend/Treat at the Glendale Water Treatment Plant
Morrill Avenue	12	Sample at the EPTDS (See Drawing No. 1) to demonstrate the running annual average is less than 10 ppb
Silver Lake	10	Sample at the EPTDS (See Drawing No. 2) to demonstrate the running annual average is less than 10 ppb
High Street	9	Sample at the EPTDS (See Drawing No. 1) to demonstrate the running annual average is less than 10 ppb
Kietzke Lane	9*	Sampling at the EPTDS (See Drawing No. 3) demonstrated the running annual average was greater than 10 ppb. Install blending pipelines (See Drawing No. 9)
Sparks Avenue	9	Sample at the EPTDS (See Drawing No. 4) to demonstrate the running annual average is less than 10 ppb
Poplar No. 2	7	Sample at the EPTDS (See Drawing No. 5) to demonstrate the running annual average is less than 10 ppb
View Street	5 (13)**	Sample at the EPTDS (See Drawing No. 6) to demonstrate the running annual average is less than 10 ppb

\* The historical average arsenic concentration has been 9 ppb. Recent spot source data have been near 17 ppb. Sampling at the EPTDS for 4 months showed the RAA was greater than 10 ppb and therefore, the blending pipeline will be installed.

\*\* The historical arsenic concentration has been as high as 13 ppb; however extensive artificial recharge activities (underground blending) result in a current wellhead concentration of approximately 5 ppb.

The Terminal, Poplar No. 1 and Pezzi wells are currently piped to the Glendale Water Treatment Plant for treatment. The Glendale plant can treat the blended water (surface and groundwater) to an arsenic concentration less than 10 ppb. Planning and preliminary designs have been completed and final design is currently underway for blending and treatment of the Mill Street, Corbett, and Greg Street wells at the Glendale WTP. The Morrill Avenue, Silver Lake, High Street, Kietzke Lane, Sparks Avenue, Poplar No. 2 and View Street wells (7 wells) have arsenic concentrations that are around 10 ppb and have had past values that exceeded 10 ppb.

The Morrill Avenue and High Street wells are currently treated for PCE removal at the Morrill Avenue site and then pumped into the distribution system. This facility is located near the corner of Morrill and East Commercial Row. The 12 inch discharge pipe from the PCE treatment unit connects with a 20 inch pipe which continues to the east (See Drawing No. 1). A sample point at the Entry Point to the Distribution System (EPTDS) will be installed just to the east of the junction of the 20, 16 and 14 inch lines to reflect the quality of water at the EPTDS. The discharge from this well site will be monitored at the EPTDS with a composite sampler that takes a 20-ml sample every hour of the day, 365 days per year (See Drawing No. 7). Composite samples will be analyzed monthly, and averaged for each quarter and reported. The average value of the last four quarters will be reported as the regulatory compliance value. If the running annual average (RAA) at the EPTDS is greater than 10 ppb at the Morrill Avenue sampling site, then a blending pipeline will be installed to reduce the arsenic concentration at this location. Drawing No. 8 shows the planning level design for this pipeline if needed.

The Silver Lake well is used for recharge during the winter months and has a 10 inch discharge line which joins a 12 inch service line serving the North Reno area. A sample point at the EPTDS will be installed immediately adjacent to the connection point as shown on Drawing No. 2. The discharge from this well site

will be monitored at the EPTDS with a composite sampler that takes a 20-ml sample every hour of the day, 365 days per year. Composite samples will be analyzed monthly, and averaged for each quarter and reported. The average value of the last four quarters will be reported as the regulatory compliance value.

The Kietzke Lane well is also treated for PCE and is pumped directly into the distribution system after treatment. The 12 inch discharge line from the well connects with a 12 inch and 8 inch distribution lines at the corner of Kietzke Street and Kietzke lane (See Drawing No. 3). A sample point was established at the EPTDS on the 12 inch distribution system line immediately downstream of the junction with the well discharge. The discharge from this well site has been monitored at the EPTDS with a composite sampler that takes a 20-ml sample every hour of the day, 365 days per year for the past four months. Composite samples were analyzed monthly, and averaged. The average value of the last four months has exceeded 10 ppb. Therefore, as for any site sampled at the EPTDS, since the RAA at the EPTDS for the Kietzke site exceeded 10 ppb, a blending pipeline will be installed to reduce the concentration of arsenic. A planning level design has been completed and is shown on Drawing No. 9. TMWA is in the process of preparing the final design drawings for construction of this pipeline. Sampling at the EPTDS will continue after installation of the blending pipeline to verify compliance at this location.

The Sparks Avenue well is located in Sparks in the parking lot adjacent to John Ascuaga's Nugget Casino as shown on Drawing Number 4. The well has a 10 inch discharge line which tees into a 10 inch distribution system line that serves Sparks. A sample point at the EPTDS will be installed adjacent to the tee. The discharge from this well site will be monitored at the EPTDS with a composite sampler that takes a 20-ml sample every hour of the day, 365 days per year. Composite samples will be analyzed monthly, and averaged for each quarter and reported. The average value of the last four quarters will be reported as the

regulatory compliance value. The composite sampler will be housed in an above ground structure that is close to the EPTDS and does not require the existing pavement to be disturbed.

PCE in detectable quantities is present in the groundwater at the Poplar No. 2 well. TMWA is currently working with the Central Truckee Meadows Remediation District in PCE treatment planning at this site. The well has had historical arsenic values greater than 10-ppb and has been used as a recharge site. The wells discharge line tees into the 12 inch discharge line from the Poplar No. 1 well that then ties into the distribution system line that serves Sparks. Please note that the discharge from the Poplar No. 1 well is directed to the Glendale WTP via a 14-inch ductile iron pipe as shown on Drawing Number 5. Where the Poplar No. 2 well enters the distribution system, a sample point at the EPTDS will be installed adjacent to the tee (See Drawing No. 5). The discharge from this well site will be monitored at the EPTDS with a composite sampler that takes a 20-ml sample every hour of the day, 365 days per year. Composite samples will be analyzed monthly, and averaged for each quarter and reported. The average value of the last four quarters will be reported as the regulatory compliance value.

The View Street well is an excellent recharge well and due to the large volume of treated surface water recharged in the well, the arsenic concentration has been consistently below 10 ppb the past two years. TMWA will continue to maximize recharge at this well and will continue to monitoring the arsenic concentration from water pumped at the wellhead. The discharge from this well site will also be monitored at the EPTDS with a composite sampler that takes a 20-ml sample every hour of the day, 365 days per year (See Drawing No. 6). Composite samples will be analyzed monthly, and averaged for each quarter and reported. The average value of the last four quarters will be reported as the regulatory compliance value.

At the Glendale Water Treatment Plant the Finished Water Pump Station is being expanded and reconstructed to accommodate the additional groundwater hydraulic loading from the Mill, Corbett and Greg Street wells. This pump station will discharge to two separate pumping zones: the Sparks zone and the Highland zone. Composite sampling devices will be installed at the EPTDS at each of these pump zone entry points that take 20-ml samples every hour of the day, 365 days per year. These composite samples will be analyzed monthly, and averaged for each quarter and reported. The average value of the last four quarters will be reported as the regulatory compliance value. Preliminary design work is just beginning (consultant selected) for this project.

### **Monitoring and Record Keeping**

At the six well sites and two treatment plant sites detailed above automatic sampling systems will be utilized to collect a composite sample for each site at the EPTDS. A typical automatic sampling system device is shown on Drawing Number 7. As described above, a 20 milliliter sample will be taken every hour, 365 days per year. At the end of every month the sample will be tested and recorded. This sampling will occur when the well is running and when it is out of service. At the end of the quarter (January – March, April – June, etc.) the three monthly results will be averaged and reported as a compliance sample. At the end of the year the four quarterly samples will be averaged to determine the annual average arsenic concentration at that point. By sampling in this manner TMWA will be utilizing 8,760 discrete samples (24 per day x 365 days per year) at each of the sites to determine the annual average arsenic concentration at that point. The Truckee Meadows Water Authority laboratory is certified by the State of Nevada, and typically all sample analysis will be completed in our laboratory using appropriate methods and procedures. A single quarterly report will be submitted that includes each of the sampling sites (eight at this time) to demonstrate compliance at each site.

## **Modeling Results**

Two drawings (Drawing Nos. 10 and 11) have been prepared that show the estimated annual average concentrations of arsenic across the distribution system for both normal and drought year conditions. Normal conditions refer to non-drought years when the surface water treatment facilities are used to their full capacity and the wells are used for summer peaking. Drought conditions rely on well use to meet water demand over a broader range of time. Drawing Numbers 12 through 14 show the first through fourth quarters of normal years. Review of all these drawings show the vast majority of the service area receives surface water with an arsenic concentration of less than 3 ppb. Only in localized areas around the Morrill, High, Kietzke, Sparks Avenue, Poplar No. 2, and View Street well sites are there potentially elevated arsenic concentrations. Monitoring at each of these sites will document the running annual average values at these locations. Discussion with the engineer who completed the modeling revealed the fact that if the wells were turned off for just 2 hours at a time per day, surface water would flush through the area and reduce the localized arsenic concentrations. The model runs were set up to represent worst case conditions, and even by assuming these conditions, the model runs demonstrate full compliance with the arsenic regulation. These drawings will be used in the public information and education sessions outlined below.

## **Compliance Costs**

Compliance at the additional ten well sites described in Table 1 as requiring treatment or monitoring, will cost (preliminary design level cost estimate) a total of eight to ten million dollars. TMWA is currently working with the engineering firms of CH2M Hill and Eco:Logic to develop the final engineering drawings for construction, and the construction cost estimate. This information would not be considered necessary for a compliance plan but is offered as additional related information.

<b><u>Compliance Method</u></b>	<b><u>Cost (\$)</u></b>
1. Piping of Mill, Corbett and Greg Street wells to the Glendale WTP	\$2.7 million
2. Treatment of 3 wells at Glendale (plant piping, treatment plant modifications, chemical feed systems)	\$2.0 million
3. Compliance monitoring at 8 sites to validate the RAA is less than 10 ppb at the EPTDS	\$0.3 million
4. Installation of blending pipeline at the Morrill Avenue site ( <u>If</u> the RAA > 10 ppb at the EPTDS)	\$1.0 million
5. Installation of blending pipeline(s) at the Kietzke Lane site (The RAA is > 10 ppb at the EPTDS)	\$1.0 million
6. Glendale WTP Finished Water Pump Station Expansion/Modifications	\$0.6 million
7. Planning/Preliminary/Final Design Engineering	<u>\$0.9 million</u>
Sub Total Compliance Costs	\$8.5 million
Contingency (15%)	<u>\$1.3 million</u>
<b>Total Arsenic Compliance Cost Estimate</b>	<b>\$9.8 million</b>

### **Public Communications and Education**

Once the Arsenic Compliance Plan is approved TMWA will conduct public education/information meetings. The goal of the Communications Plan will be to educate target audiences on how TMWA plans to comply with the Federal and State Arsenic Rule, and how this compliance is justified and critical to the health and integrity of the community's drinking water system. The plan will provide information to the media and the public to both inform and educate interested parties, and will provide an opportunity for as much public/customer input as feasible.

The objective of the plan is to deliver key messages to 100 % of the target audiences that TMWA will be in complete compliance with the Federal and State regulations on or before the January 2006 effective date of the Arsenic Rule.

The target audiences include the following groups:

- ◆ All TMWA bill paying customers.

- ◆ TMWA employees and contractors including the Call Center staff.
- ◆ TMWA Board of Directors and Technical Advisory Committee members.
- ◆ Local media including newspapers, radio and television.
- ◆ Key local and State government officials and employees.
- ◆ All TMWA water consumers, including those who consume TMWA water but may not pay a water bill such as renters, etc.

The key messages and themes that will be put forth include the following:

- ◆ The TMWA drinking water system will be in compliance with the Federal and State Arsenic Rule on or before the mandatory compliance date of January 2006.
- ◆ A summary of the details of the Arsenic Compliance Plan including the following elements:
  - ✓ Currently used wells that will need to be treated.
  - ✓ Why they need to be treated and how it will be done.
  - ✓ Arsenic levels in the TMWA distribution system once the treatment has been provided.
  - ✓ Estimated costs and rate impacts from the changes.

The following external and internal communications channels will be utilized:

- ◆ External communications strategy:
  - ✓ News releases, media advisories and media packets.
  - ✓ Media briefing sessions.
  - ✓ Advertisements.
  - ✓ Bill inserts.
  - ✓ Workshops.
  - ✓ Website.
- ◆ Internal communications strategy;
  - ✓ Question and answer sheets for Call Center staff.
  - ✓ Speaker's bureau.
  - ✓ Employee meetings and newsletters.
  - ✓ TMWA Board of Director briefing sessions at Board meetings.

The schedule for this communications plan is to develop the information in the Winter and Spring of 2005 and to start to begin the education/informational workshops in the Summer and Fall of 2005.