**Summary of SDWA Compliance for Hopi Water Systems with Arsenic Treatment:**

**BIA Keams Canyons PWS**

BIA Keams Canyon operates an Adedge adsorptive media arsenic removal plant. Prior to filter vessels, raw water is injected with CO2 gas to lower to the pH from 9.0 to 7.0-7.8. Sodium hypochlorite solution is then injected for disinfection and oxidation of the dissolved arsenic. Post-treatment pH adjustment was not included in the design. The treatment plant came online in April 2012. The treatment plant design capacity is 150 gallons per minute (gpm). The average daily demand is estimated to be 62,500 gpd. The filter vessels are backwashed every sixty days and they recycle the backwash back through the plant. (See sanitary survey report)

*Arsenic Rule*- BIA Keams Canyon PWS has been in compliance with EPA's arsenic standard since the 4th quarter of 2012. They test monthly for influent and effluent levels of arsenic at their treatment plant. While they have maintained compliance on a running annual average basis, they have experienced multiple instances where their individual monthly samples have exceeded EPA's arsenic standard of 10 parts per billion since startup of the treatment plant (approximately once per year).

Arsenic rule compliance samples are required to be taken at the entry point to the distribution system (i.e. after treatment before the first customer). However, EPA has received sample results that were taken in the distribution after start-up (Building 59 on 9/3/2013) that show arsenic levels (57 ppb) that were greater than raw water concentration (30 ppb) which may be indicative of arsenic leaching from the distribution system pipes.

*Lead and Copper Rule*- Since the installation of the arsenic treatment system which includes pre-treatment pH adjustment but no post-treatment raising of the pH, the BIA Keams Canyon system experienced a sampling event on 6/17/2015 where they exceeded EPA's action level for lead in the distribution system (16 ppb Lead). Lowering the historical pH of the water increases its corrosivity which may contribute to increased lead levels in the distribution system.

*Monitoring, Reporting Violations* – In 2016 and 2013 they received monitoring violations related to the lead and copper rule. They have since returned to compliance.

*Operator Certification*- The operator certification requirements for this plant require a water operator to be certified at a Treatment Level 2 certification. Their current operator, Scott Walker has a distribution level certification but does not hold a treatment level certification.

**Second Mesa Day School**-

*Arsenic Rule*- Second Mesa Day School first commissioned its Isolux arsenic treatment system on June 5, 2007. The first quarter they came into compliance with EPA's standard was the fourth quarter of 2008. Since that time, they have again violated the arsenic rule in the following quarters: 2Q2017, 1Q2017, 4Q2016, 3Q2013, 2Q2013, 1Q2013, 4Q2012. Their current running annual average for the 2nd quarter of 2017 was 13.6 parts per billion.

*Monitoring, Reporting and Public Notice Violations* - They have received numerous M+R violations since 2007 for failure to monitor for arsenic, other inorganics, total coliform, disinfection by-products, nitrate, VOCs, SOCs and radionuclides. They've also received violations (2 in 2013) for failure to post public notices for MCL violations relating to their arsenic exceedances.

*Operator Certification* - They do not currently employ a certified operator. The operator certification requirements for this plant require a water operator to be certified at a Treatment Level 2 certification. The raw water has a high level of vanadium which may necessitate having to replace the Isolux cartridges on a more regular basis and the water systems' pattern of intermittent compliance with the arsenic standard.

**Hopi Junior-Senior High School**

*Arsenic Rule*- Hopi High School has operated its reverse osmosis plant since 1998. It's unclear when they installed the KDF cartridge filters which likely remove arsenic. They were out of compliance for an extended period between 2007 and 2010 and subject to an enforcement order. More recently they received violations for arsenic MCL exceedances from January 2016 through March 2017 (5 quarterly violations). Their most recent running annual average is 9.6 ppb

*Lead and Copper Rule* – In 2011, they Hopi High School system experienced a sampling event on 8/02/2011 where they exceeded EPA's action level for lead in the distribution system (18 ppb Lead).

*Monitoring, Reporting and Public Notice Violations* - They have received numerous M+R violations in the last ten years for failure to monitor for arsenic, other inorganics, lead and copper, total coliform, disinfection by-products, nitrate, VOCs, and radionuclides. They've also received violations (in 2015 and 2016) for failure to post public notices for MCL violations relating to their arsenic exceedances.

*Operator Certification* –The operator certification requirements for this plant require a water operator to be certified at a Treatment Level 2, Distribution level 1 certification. The current operator is certified at a treatment level 1, no distribution certification.

**Existing Operator Certification Levels at 4 HAMP village Systems:**

| Water System | Highest Level Treatment Certification | Highest Level Distribution Certification |
|---|---|---|
| Polacca | None | None |
| Sipaulovi | Treatment Level 1 | Distribution Level 1 |
| Mishongnovi | Treatment Level 1 | Distribution Level 1 |
| Shungopavi | none | Distribution Level 1 |

Adding an arsenic treatment system at each water system would bump up the required levels from T1 to T2. Polacca also requires a D2 operator. The second mesa villages require a D1 operator.