



PUBLIC WORKS-UTILITIES DEPARTMENT

MEMORANDUM

Date: July 11, 2011

To: Members of the MAG Standard Specifications and Details Committee

FROM: Javier Setovich (City of Peoria)

RE: Progress Report
Case 11-03 Replace Cadmium Plated Bolts Referenced in Section 610.13 with Zinc Plated Bolts as Described in ASTM-B633

This case is addressing the current use of cadmium plated bolts on potable water pipe mechanical joints that are buried. Cadmium plating is used in this manner to minimize the effects of aggressive soils and reduce corrosion, allowing for an extended lifespan of these fittings as well as easier disassembling if needed.

Concerns with the use of cadmium have been raised to this committee. These concerns are related to the following areas:

1. Health effects to personnel
2. Quality of the material. Accepted use of cadmium plated bolts in the industry
3. Effects on the environment

Health Effects to Personnel

Extensive information can be found that attributes considerable health hazards to the use of cadmium in various manufacturing processes as well as the plating process. Exposure limits are defined and enforced in the industry. The majority of hazards seem to be related to airborne particles generated during manufacturing. There is no evidence that handling bolts is a cause for concern. In addition, simple protection equipment like gloves, and proper hygiene practices, like washing hands, would eliminate any potential direct contact with a hazardous level of exposure.

Quality of Materials

Cadmium bolts are generally specified as the material of choice for mechanical joints and other fittings to be buried. A check with a local vendor identified cadmium plated bolts as the standard issue for this purpose. Differing from this standard would be considered a special order. Currently MAG and AWWA accept and/or recommend cadmium plated bolts as acceptable. Online research has revealed the exception of these bolts as a choice material, but only in certain aeronautical related uses. A construction/water industry related issue has not been found to this point.

Effects on the Environment

The EPA has classified cadmium as a potential contaminant source in drinking water, with health effects related to long term exposure to levels above the MCL (Maximum Contaminant Level). No data could be located at this point that identifies cadmium plated bolts as a potential source of contamination. More study would be needed to prove or discount this possibility.

Interim Conclusion

The current research related to case 11-03 has not been able to identify measurable issues that would warrant the ban by MAG of cadmium plated bolts. The most significant effect could possibly be related to the environmental impact to drinking water, by leaching of the material to the aquifer. Extensive research would need to be done to isolate these bolts as a potential source of contamination in damaging levels. Research of this type would be beyond the scope of the MAG Standard Specifications and Details Committee.

Comments on this document are requested from the committee and can be sent to my email at javier.setovich@peoriaaz.gov