Arizona Department of Environmental Quality
Underground Storage Tank Section
3033 N. Central Ave.
Phoenix, AZ 85012

CATHODIC PROTECTION

...protecting USTs from Corrosion

What is it?

3 Cathodic protection protects steel USTs from corrosion which is the natural electrochemical process that results in the deterioration of a material because of its reaction with its environment.

3 There are two types of cathodic protection:
- **Ø** Sacrificial Anodes (Galvanic Systems)
- **Ù** Impressed (Induced) Current Systems

Will you be in Compliance?

3 Adding cathodic protection along with spill and overfill protection meets the 1998 upgrades for existing USTs.

3 Cathodic protection can only be added on UST tanks with ensured integrity. Contact the section for integrity assessment methodologies.

3 Cathodic protection can also protect metal piping associated with the UST system.

3 Depleted anodes must be replaced for continued cathodic protection.

Regulations and Required Documentation

3 State law requires that the field installed cathodic protection systems at UST sites be designed by a corrosion expert. Contact the National Association of Corrosion Engineers @ 281-228-6200 for a list of corrosion experts.

3 For **CATHODIC PROTECTION** systems:

- # The system must be tested by an ADEQ certified cathodic protection tester within 6 months of installation or repair and at least every 3 years thereafter.
- # You need to keep the results of the last two tests to prove that the cathodic protection is working.

3 Additional requirements for an **IMPRESSED CURRENT** system:

- # You must inspect an impressed current system every 60 days to verify that the system is operating.
- # Keep the results of your last three 60-day inspections to prove that the impressed current system is operating properly.

How Does Cathodic Protection Work ?

SACRIFICIAL ANODES OR GALVANIC SYSTEMS

- Sacrificial anodes are pieces of metal more electrically active than the steel UST system. Because these anodes are more active, the corrosive current will exit from them rather than the UST system. Thus, the UST system is protected while the attached anode is "sacrificed."

- Sacrificial anodes can be attached to existing USTs or coated steel new USTs for a pre-engineered cathodic protection system.

- The UST coating must be of a suitable dielectric material. In other words, the coating will electrically isolate the UST from its environment and meet applicable industry codes. ***An asphalt coating is not considered a suitable dielectric coating.***

- Depleted anodes must be replaced for continued cathodic protection of the UST system.

IMPRESSED OR INDUCED CURRENT SYSTEMS

- An impressed current cathodic protection system consists of anodes, cathodes, a rectifier and the soil.

- The rectifier converts the alternating current to direct current. The direct current is then sent through an insulated copper wire to anodes that are buried in the soil near the UST system.

- Typical anode materials are ceramic, high silicon cast iron, or graphite. Ceramic anodes are not consumed, where as high silicon cast iron and graphite anodes partially dissolve each year and must be replaced over time.

- The direct current then flows from the anode through the soil to the UST system, which acts as the cathode, and back to the rectifier through another insulated copper wire.

- As a result of the electrochemical properties of the impressed current cathodic protection system, corrosion takes place only at the anodes and not at the UST system.

- Depleted anodes must be replaced for continued cathodic protection of the UST system.