Department of Labor & Employment – Division of Oil & Public Safety
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INSPECTION REQUIREMENTS FOR INTERNALY LINED USTS GUIDANCE DOCUMENT

March, 2005

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INTRODUCTION

Since December 1, 1989 ,Colorado Storage Tank Regulations [7 CCR 1101-14] have required all regulated underground storage tanks (UST) and/or piping, installed on or after December 22, 1998 to meet the performance standards for new UST systems included in §2-2-8. All existing UST systems had to be upgraded by December 22, 1998, in accordance with the requirements for Upgrading of existing UST systems included in §2-2-9. The regulations referenced above required all regulated UST and/or piping that routinely contains product to be protected from corrosion.

Existing steel tanks could be upgraded to meet the corrosion protection requirement of the new tank standards by one of the following methods: (a) Interior tank lining, (b) Cathodic Protection (either galvanic cathodic protection or impressed current cathodic protection, or (c) Interior tank lining combined with cathodic protection.

The purpose of this guidance document is to assist the regulated community in understanding the requirements for continued operation of UST system(s) that met the corrosion protection requirement either by interior tank lining, or interior tank lining combined with cathodic protection. This document also provides guidance to owners who want to change their corrosion protection method from internal lining to cathodic protection to avoid the recurring costs of internal inspections.

INTERNAL LINING RE-INSPECTION REQUIREMENTS

A steel underground storage tank that satisfies the corrosion protection requirement of §2-2-9(b)(1) of the Colorado Storage Tank Regulations [7 CCR 1101-14] by the addition of an internal lining must be internally inspected within 10 years of the date the tank was lined and every 5 years after that. The purpose of the inspection is to determine if the lining continues to perform according to the manufacturer's specifications and if the lined tank is still structurally sound.

Colorado accepts either Manned Entry or Video Camera internal inspections. Before the internal inspection is performed, the UST must first pass a 0.1 gph tightness test. The requirements for conducting the 0.1gph tightness test are outlined on page 7 of this document (refer to Step 1: Tank Integrity Assessment).

Manned Entry Inspections shall be performed per:

- API Standard 1631 (*Interior Lining and Periodic Inspection of Underground Storage Tanks*)

Manned entry inspections include measuring the tank's metal thickness. If the thickness is 75% - 85% of the original metal thickness, cathodic protection must be added within 6 months. If the thickness is <75% of the original metal thickness, the tank must be permanently closed in accordance with Colorado's Petroleum Storage Tank Regulations.

Video Camera Inspections shall be performed per either:

- API Standard 1631
- *Recommended Practice for Inspecting Buried Lined Steel Tanks Using a Video Camera* developed by Ken Wilcox Associates Inc. (KWA), Methods A and C; and ASTM G-158 (approved prediction models)

Both video camera inspection procedures involve soil sampling and corrosion modeling in lieu of actual tank metal thickness measurements.

If a tank fails the video inspection (i.e. it does not meet any of the minimum requirements specified in §10.3 of the KWA Recommended Practice for Inspecting Buried Lined Steel Tanks Using a Video Camera), it must be inspected by manned entry.

If a tank fails the manned entry inspection (i.e. it does not meet any of the minimum requirements specified in §10.4 and §10.4 of API Standard 1631), it must be either repaired per NLPA Standard 631 (*Entry,Cleaning, Interior Inspection, Repair and Lining of Underground Storage Tanks)*or closed. The repaired lining must meet the requirements of API 1631, §8.

Failure to conduct the internal inspection within 10 years of the date the tank was lined and every 5 years after that, is a regulatory violation, which normally results in fines and penalties, and closure of the tank. However, as part of a settlement offer, OPS will allow owner/operators that have missed the 10 year internal lining inspection, until December 31, 2005 to add cathodic protection if installed in accordance with OPS's Alternative Assessment Procedure For Internally Lined Tanks. After December 31, 2005, owners that have missed the 10 year internal lining inspection will have no option but to close the lined tank.

UPGRADING WITH CATHODIC PROTECTION

An existing steel UST could be upgraded with cathodic protection to satisfy the corrosion protection requirement of §2-2-9(b)(2) if all of the following criteria were met:

- The field-installed cathodic protection system is designed by a corrosion expert, and
- The impressed current systems is designed to allow determination of current operating status (per §2-3-2(c)), and
- The cathodic protection systems are operated and maintained in accordance with §2-3-2, and
- The integrity of the tank is ensured using one of the following methods:

  (i) The tank is internally inspected and assessed to ensure that the tank is structurally sound and free of corrosion holes prior to installing the cathodic protection system; or

  (ii) The tank has been installed for less than 10 years and is monitored monthly for releases in accordance with section 2-4-4(d) through (h); or

  (iii) The tank has been installed for less than 10 years and is assessed for corrosion holes by conducting two (2) tightness tests that meet the requirements of section 2-4-4(c). The first tightness test must be conducted prior to installing the cathodic protection system. The second tightness test must be conducted between three (3) and six (6) months following the first operation of the cathodic protection system; or

(iv) The tank is assessed for corrosion holes by a method that is determined by the State Inspector of Oils to prevent releases in a manner that is no less protective of human health and the environment than paragraphs (b)(2)(i) through (iii) of this section.

INTERNAL LINING COMBINED WITH CATHODIC PROTECTION

A UST could be upgraded to meet the 1998 corrosion protection requirement by using both internal lining and cathodic protection if:

- The lining is installed in accordance with the requirements of § 2-3-4; and
- The cathodic protection system meets the requirements of § 2-2-8(a)(2)(ii), (iii), and (iv).

The regulations required the interior lining to be installed in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory, and required an internal inspection of the tank be conducted prior to application of the lining. The regulations also required the cathodic protection system be designed by a corrosion expert, impressed current systems to be designed to allow determination of current operating status, and that that these systems be operated and maintained pursuant to §2-3-2 (See §2-2-9 (b)(3)(ii)). This last point means that cathodic protection systems must be subjected to periodic monitoring to ensure they are working properly and protecting the UST even though the tank has been properly lined.

The following codes and standards were used to comply with this section

1. American Petroleum Institute Publication 1631, "Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks"
2. National Leak Prevention Association Standard 631, "Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection"
3. National Association of Corrosion Engineers Standard RP-02-85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems"; and
4. American Petroleum Institute Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems."

For USTs that met the 1998 corrosion protection requirement by choosing internal lining combined with cathodic protection, the periodic re-inspection requirement for the lined tank <u>will not be required if all of the following conditions are met:</u>

- The lining is installed in accordance with the requirements of § 2-3-4; and
- The cathodic protection system meets the requirements of § 2-2-8(a)(2)(ii), (iii), and (iv); and
- Owners/operators provide records that demonstrate that the lining and cathodic protection system installation were <u>both</u> completed **before December 22, 1998** in accordance with the above requirements.

NOTE: If an owner does not have records from the installation of the cathodic protection system, but can document that a 6-month or 3-year cathodic protection system operation test was successfully completed by a **<u>NACE certified corrosion tester</u>** before

December 22, 1998, OPS will accept that as adequate documentation for the cathodic protection system.

However, the cathodic protection system must continue to be operated and maintained in accordance with §2-3-2.

Owners/operators that choose internal lining combined with cathodic protection should be aware that API Standard 1631 and NLPA 631 which were both widely used, allowed a tank with perforations up to 2.5 inches in diameter to be lined (i.e. it did not need to be free of corrosion holes, only the structural integrity of the tank was evaluated). The perforations could be plugged with boiler plugs or hydraulic cement, prior to sandblasting and application of the liner. The lining was intended to provide containment and prevent releases. Adding cathodic protection to a lined tank with existing corrosion holes only prevents further corrosion, and dropping the requirement to maintain the lining does not provide the level of protection originally relied upon. Therefore if an owner/operator does not have documentation showing that the tank was free from corrosion holes prior to the installation of the lining, OPS recommends they conduct re-inspection of and maintenance of the internal lining to prevent a future release. **OPS will not allow any repairs to the lining of an UST if the lining has not been internally inspected within 10 years of the date the tank was lined and every 5 years after that. The only option would be to permanently close the UST.**

If an owner/operator added cathodic protection **after December 22, 1998**, to a previously internally lined tank, then in order not to be required to perform periodic internal inspections of the lined tank, the following must have been done.

Prior to the addition of cathodic protection, the integrity of the UST must be ensured pursuant to §2-2-9 (b)(2). The method of integrity assessment must ensure the integrity of the UST, not just the lining. Once installed, the cathodic protection system must be operated and maintained in accordance with §2-3-2. If the above criteria are used, then internal lining is no longer considered the sole method of corrosion protection upgrade and periodic inspection of the lining is not required.

Regarding the integrity assessment set forth in §2-2-9 (b)(2), OPS requires that an acceptable method of ensuring the tank's integrity is to have a corrosion expert defined in §2-1-2 determine that the UST is structurally sound and free of corrosion holes. The owner/operator should maintain a record regarding this determination for the operating life of the UST. If a cathodic protection system is added to a lined tank using the above criteria, OPS recommends that the lined tank no longer require periodic inspection of the lining.

If cathodic protection is added to an UST whose integrity was not ensured, then periodic monitoring/inspection of both the cathodic protection system and lining is required, because you cannot prove that the tank was structurally sound and free of corrosion holes when the cathodic protection was added. The lined tank needs to be periodically inspected because the lining may be the only barrier between your product and the surrounding environment.

However, if documentation is not available, and the Alternative Assessment Procedure For Internally Lined Tanks described below is successfully completed, OPS will consider

the interior lining not to be the sole method for meeting the corrosion protection upgrade, and periodic inspections of the lined tank are not required.

ALTERNATIVE ASSESSMENT PROCEDURE FOR INTERNALLY LINED TANKS

Before the installation of a galvanic or impressed current cathodic protection system, the tank's integrity must be insured via one of the methods at §2-2-9(b)(2)(i)-(iv) of the Colorado Petroleum Storage Tank Regulations. These options appropriately address assessing an unlined steel UST's integrity before adding cathodic protection. Options (i) – (iii), however, which rely on an internal inspection and a tightness test, or solely on a tightness test (tanks <10 years old), are less effective for assessing a lined UST's integrity, because the presence of a lining can prevent identifying corrosion holes.

OPS has developed a procedure that it believes will prevent releases in a manner no less protective of human health and the environment than options §2-2-9(b)(2)(i)–(iii), such that it satisfies the requirements of §2-2-9(b)(2)(iv). The OPS procedure is based on, and requires use of the American Society of Testing and Materials (ASTM) G 158-98 (*Standard Guide for Three Methods of Assessing Buried Steel Tanks*) to inspect and assess buried steel tanks for corrosion damage, and to determine the suitability of these tanks prior to the application of cathodic protection.

The OPS requires all criteria of the following procedure to be met when cathodic protection is now added to a previously lined steel UST. No inspection of the internal lining will be required after the successful addition of cathodic protection per the following criteria.

Step 1: Tank Tightness Test

1. Conduct a .1 gph tightness test of the entire UST system (tank and lines), in accordance with 2-4-4(c) (tank) and 2-4-5(b) (piping) of the Colorado Petroleum Storage Tank Regulations. The method or device must be included on the current list published by the National Work Group of Leak Detection Evaluations. If an underfill precision test is used, the ullage space must also be tested at the same time. Monthly monitoring methods and Statistical Inventory Reconciliation do not satisfy this requirement, regardless of the tank's age.

2. If an automatic tank gauge is used to meet this requirement, the following conditions must be met:
    a. The ATG must be permanently installed and third-party certified as capable of performing a 0.10 gph leak test with a probability of detection ≥ 95% and a probability of false alarm ≤ 5%.
    b. The ATG must test the tank at the maximum product level capacity allowed by the overfill device, or an ullage test must be conducted on the unfilled portion of the tank in conduction with an ATG underfill tightness test on the portion of the tank containing product.
    c. The tank must be idle during the test.

Conduct the tightness test of the UST system no more than 120 days before the addition of the cathodic protection system has been completed. If the tank fails the tightness test, the tank must be repaired and retested or permanently closed.

Step 2: Site Assessment and Tank Integrity Assessment
Complete on-site testing, laboratory testing, and data analysis according to:

1. ASTM G 158-98 (*Standard Guide for Three Methods of Assessing Buried Steel Tanks*) Methods A or C, and
2. Testing for the presence of petroleum contamination in accordance with the requirements outlined in the Colorado Petroleum Storage Tank Owner Operator Guidance Document, under Section 4.0 Analytical Requirements.

Results from the above testing should be used to analyze and determine the suitability of a tank for upgrading with cathodic protection. If any testing results do not satisfy the Site Specific Value Criteria established for Methods A (§ 9.2.2) or Method C (11.3.5.2) of the American Society of Testing and Materials (ASTM) G 158-98 (*Standard Guide for Three Methods of Assessing Buried Steel Tanks*), and or if there is any reason to assume a release has occurred, (stained soils, soils with petroleum odors, elevated readings of field monitoring instruments, lab analytical results), the tank is not suitable for the addition of cathodic protection, and must be permanently closed.

Step 3: CP System Design and Installation
The field-installed cathodic protection system must be designed by a corrosion expert and must meet the design and installation criteria of the NACE Standard RP0285-2002. A corrosion expert is a person certified by the National Association of Corrosion Engineers as a *Cathodic Protection Specialist* (CP Level 4).

At least 30 days before adding cathodic protection, submit to OPS a completed Installation and Upgrade Application, together with the $150 fee. Include with the Application information about system tightness tests, site assessment results, and information about the proposed cathodic protection system, using the forms provided by OPS. These forms include statements by the contractor and owner/operator certifying that the standard practice and procedures were used, and that all information submitted with the application is true, accurate and complete. OPS will expedite review of these completed applications, so that the installation of the CP system can proceed in a timely manner.

Step 4: Post-Installation Requirements
1. Implement or continue an approved monthly monitoring release detection method within 30 days. The combination of inventory control and tank tightness testing may not be used to meet release detection requirements for USTs assessed via this alternative procedure.
2. Conduct a precision test of the entire tank system, as described in the above Tank Integrity Assessment section within 6 months after adding the cathodic protection system.
3. Continue to follow all general operating and testing requirements for cathodic protection systems required by the Colorado Petroleum Storage Tank Regulations (§2-3-2**)**. All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter.

No inspection of the internal lining will be required after the successful addition of cathodic protection using this procedure.

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INTERIOR LINING INSPECTION FORM

Facility Information	Interior Lining Inspector Information
Facility Contact:	Person Conducting Test:
Facility Name:	Name of Company:
Address:	Address:
City, County, Zip Code:	City, State, Zip Code:
Facility I.D. Number:	Phone Number:
Owner Information	**General Information**
Owner:	Date of Inspection:
Address:	Code of Practice used:
City, State, Zip Code:	Date Lining Installed:
Phone Number:	Date Lining Last Inspected:

Answer each question as specified. If there are more than 4 tanks at this site, photocopy pages and complete for additional tanks.	**Unique Tank No.**	**Unique Tank No.**	**Unique Tank No.**	**Unique Tank No.**
Tank capacity in gallons?				
Product stored? Gasoline, Diesel, Other(specify)				
Tank Tightness Test Result (Pass/Fail)				
TANK CLEANING PRIOR TO INSPECTION				
Interior of tank was cleaned as required for the use of ultrasonic thickness gauging equipment?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Estimate of the volume of sludge removed in gallons? Attach invoice or receipt for removal and disposal.				
VISUAL INSPECTION OF LINING				
Evidence of peeling, of internal lining?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Evidence of blistering of internal lining?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Evidence of surface wrinkling of internal lining?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Evidence of roughing of internal lining?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Imperfections in lining repaired in accordance with lining material manufacturer's specifications?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**

For each tank, provide description, location and extent of any evidence of peeling, blistering, wrinkling, and roughing of internal lining:

Unique Tank No.
Unique Tank No.
Unique Tank No.
Unique Tank No.

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TESTING OF LINING				
Test procedure used to determine lining thickness?				
Number of lining thickness readings taken?				
Lining minimum thickness is 100 mils and nominal thickness is 125 mils?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Inadequate thickness repaired in accordance with lining material manufacturer and tank re-tested with no inadequate thickness detected?	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**
Test procedure used to determine lining holidays?				
Entire surface tested for holidays?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Presence of holidays detected?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Holidays repaired in accordance with lining material manufacturer and tank re-tested with no holidays detected?	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**
Test procedure used to determine lining hardness?				
Number of hardness readings taken?				
Minimum lining hardness?				
Lining hardness meets manufacturer's specifications?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Inadequate hardness repaired in accordance with lining material manufacturer and tank re-tested with no inadequate hardness detected?	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**	**(YES)(NO) (N/A)**

TANK METAL THICKNESS TEST RESULTS AND TANK REPAIR				
Any holes or perforations found in tank?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Original tank metal thickness?				
Average tank metal thickness for entire tank before repair?				
Were any thin wall areas repaired and re-lined?	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**	**(YES)(NO)**
Percentage of original tank metal thickness after repair?				

RESULTS OF INTERIOR LINING INSPECTION

- ☐ **Tank has perforations and/or holes; *TANK MUST BE PERMANENTLY CLOSED.***
- ☐ **After allowable repairs, average metal thickness is less than 75% of original tank metal thickness; *TANK MUST BE PERMANENTLY CLOSED.***
- ☐ **After allowable repairs, average tank metal thickness is between 75 and 85 percent of original tank metal thickness; *CATHODIC PROTECTION IS REQUIRED WITHIN SIX MONTHS OF THIS INSPECTION.***
- ☐ **After allowable repairs, average tank metal thickness is between 85 and 100 percent of original tank metal thickness; *CATHODIC PROTECTION IS NOT REQUIRED, RE-INSPECT LINING WITHIN 5 YEARS.***

NEXT INTERIOR LINING INSPECTION REQUIRED

Month: **Day:** **Year:**

Inspections must be performed every five years after the initial 10-year inspection. The owner/operator is required to keep a copy of this form on file until the next inspection is completed.

CERTIFICATION

I certify under penalty of law that the internal inspection was performed in accordance with the latest edition of the code of practice specified on page 1 of this form, and information in that and all attached documents is true, accurate and complete.

_____

Signature of Internal Lining Inspector **Date**

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information, the information is true, accurate and complete.

_____

Signature of Owner/Operator **Date**

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TANK INTEGRITY CERTIFICATION

(For Use with Three Methods of Assessing of Buried Steel Tanks Prior to the Addition of Cathodic Protection, ASTM G158-98. Upgrades using ASTM G158-98 must be combined with monthly monitoring for release detection.)

I. Facility Information
Facility ID: _____
Facility Name: _____
Facility Address:_____
(street) (city) (state) (zip)

II. Corrosion Tester:_____ Phone No.: (_____) _____-_____
Corrosion Expert:_____ Phone No.: (_____) _____-_____
Certification (Check one of the following):
___ **NACE certification type and number:**_____
___ **Professional Engineer certification type and number:** _____
Company Name:_____
Company Address: :_____
(street) (city) (state) (zip)

III. Methodology: This method follows the specific ASTM G158-98 procedures of field and laboratory testing and analysis for (check one of the following):
___ **Method A** - Noninvasive with Primary Emphasis on Statistical and Electrochemical Analysis of External Site Environmental Corrosion
___ **Method B** - Invasive Ultrasonic Thickness Testing with External Corrosion Evaluation
___ **Method C** - Invasive Permanently Recorded Visual Inspection Including External Corrosion Assessment.

IV. Tank Information

OPS Tank Number					
Tank capacity (gals)					
Tank dimensions					
Product stored					
Year Installed					
Tank Material					

V. Analysis and Determination of Suitability for Addition of Cathodic Protection

Tank Tightness Test Result (Pass/Fail)					
Soil contamination encountered (Yes/No)					
Percent corrosion immediately below fill riser (%)					
Soil resistivity at the average tank depth (ohm-cm)					
Soil pH					
Soluble chloride ion concentration (ppm)					
Sulfide test (positive/negative)					
Average tank to-soil potential on the UST (mV)					
Expected leak-free life of tank					
Tank age less than the expected leak free life? (Yes/No)					
Integrity Assessment Result (Pass/Fail)					

Tank Suitable for Addition of CP (Yes/No)					

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VI. Corrosion Expert Certification

I certify under penalty of law that:

- All phases of work under ASTM G158-98 were conducted under the responsible supervision of a corrosion expert; and,
- Personnel performing the assessment work on the tank(s) are knowledgeable of all the applicable procedures in ASTM G158-98; and,
- All work was performed in strict accordance with ASTM G158-98.
- All information on this and all attached documents is true, accurate and complete.

_____

Signature of Corrosion Expert **Date**

VII. Owner/Operator Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information, the information is true, accurate and complete.

_____

Signature of Owner/Operator **Date**

Please attach the following:

1. Tank tightness test results
2. All site specific data collected to determine suitability for addition of CP (soil type, resistivity, pH etc)
3. All calculations used to determine suitability for addition of CP.
4. All calculations used to determine system requirements.
5. Anticipated current requirement for impressed current systems.
6. Provide location of rectifier for impressed current systems.
7. Provide type, size, location and burial depth of all anodes.
8. Provide location of all test points.
9. Provide location and burial depth of all subsurface wiring for impressed current systems.

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CATHODIC PROTECTION MONITORING FORM

Facility Information	Cathodic Protection Tester Information
Facility I.D. Number:	Person Conducting Test:
Facility Name:	Name of Testing Company:
Address:	Address:
City, County, Zip Code:	City, State, Zip Code:
CP System: Galvanic or Impressed Current *(Circle One)*	Phone Number:
Owner Information	**General Information**
Owner:	Date of Testing:
Address:	Temperature:
City, State, Zip Code:	Weather Conditions:
Phone Number:	Soil Conditions:

A qualified cathodic protection tester must test all UST systems equipped with cathodic protection within 6 months of installation or repair of any portion of the UST system, and at least every 3 years thereafter. This form is designed to document these tests. Please use photocopies of the appropriate pages if you have more than 4 tanks at any one location. The UST owner is required to keep this form on file until the next test is completed.

UST owners and operators must also inspect IMPRESSED CURRENT cathodic protection systems every 60 days to ensure equipment is operating properly. This form is not designed to document these inspections. Instead, the "IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM 60-DAY INSPECTION LOG" form or equivalent form should be maintained to document the date, inspector, and results of these inspections.

In the space below, sketch the important parts of the facility such as tanks, manways, fill pipes, tank monitor, vapor recovery connections, piping, vents, anodes, pump islands, and buildings. Indicate reference cell locations using location code "R" and sequential numbers (e.g. R1, R2...) and structure contact points using the location code "S" and sequential numbers (e.g. S1, S2…). For each tank, include OPS unique tank number, tank size, and type of product stored. Use these letter and number designations in the tables on the following pages to indicate reference cell locations and structure contact locations used for each measurement.

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Facility Name: _____ Facility I. D. Number: _____

CONTINUITY MEASUREMENTS (GALVANIC & IMPRESSED CURRENT SYSTEMS)			
Location Code *(see page 1)*	Reference Cell Location and Structure Contact Points *(check all available points)*	Voltage (*millivolts*)	Comments *(continuous, isolated, etc.)*
OPS Unique Tank # _____			
R __	_____*	----------	
S __	Fill pipe riser		
S __	Pump riser		
S __	Tank monitor riser		
S __	Vapor recovery connection		
S __	Product piping at dispenser		
S __	Vent riser		
S __	Vent line		
S __	Other _____*		
S __	Other _____*		
OPS Unique Tank # _____			
R __	_____*	----------	
S __	Fill pipe riser		
S __	Pump riser		
S __	Tank monitor riser		
S __	Vapor recovery connection		
S __	Product piping at dispenser		
S __	Vent riser		
S __	Vent line		
S __	Other _____*		
S __	Other_____*		
OPS Unique Tank # _____			
R __	_____*	----------	
S __	Fill pipe riser		
S __	Pump riser		
S __	Tank monitor riser		
S __	Vapor recovery connection		
S __	Product piping at dispenser		
S __	Vent riser		
S __	Vent line		
S __	Other _____*		
S __	Other _____*		
OPS Unique Tank # _____			
R __	_____*	----------	
S __	Fill pipe riser		
S __	Pump riser		
S __	Tank monitor riser		
S __	Vapor recovery connection		
S __	Product piping at dispenser		
S __	Vent riser		
S __	Vent line		
S __	Other _____*		
S __	Other _____*		

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Facility Name: ____ Facility I. D. Number: ________________

STRUCTURE TO SOIL POTENTIAL MEASUREMENTS (GALVANIC SYSTEMS)			
Location Code *(see page 1)*	Structure Contact Points *(use one point per tank)* and Reference Cell Locations *(check minimum of 3 locations)*	Voltage *(millivolts)*	Comments *(pass, fail, etc.)*
OPS Unique Tank # ____________			
S __	Test station lead wire	--------------	
S __	Tank bottom	--------------	
R __	Pump manway		
R __	Tank monitor manway		
R __	Vapor recovery manway		
R __	Vent riser manway		
R __	Other __________________*		
R __	Other __________________*		
R __	Other __________________*		
OPS Unique Tank # ____________			
S __	Test station lead wire	--------------	
S __	Tank bottom	--------------	
R __	Pump manway		
R __	Tank monitor manway		
R __	Vapor recovery manway		
R __	Vent riser manway		
R __	Other __________________*		
R __	Other __________________*		
R __	Other __________________*		
OPS Unique Tank # ____________			
S __	Test station lead wire	--------------	
S __	Tank bottom	--------------	
R __	Pump manway		
R __	Tank monitor manway		
R __	Vapor recovery manway		
R __	Vent riser manway		
R __	Other __________________*		
R __	Other __________________*		
R __	Other __________________*		
OPS Unique Tank # ____________			
S __	Test station lead wire	--------------	
S __	Tank bottom	--------------	
R __	Pump manway		
R __	Tank monitor manway		
R __	Vapor recovery manway		
R __	Vent riser manway		
R __	Other __________________*		
R __	Other __________________*		
R __	Other __________________*		

*Describe Location

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Facility Name: _____ Facility I. D. Number: _____

100 MILLIVOLT POLARIZATION DECAY MEASUREMENTS (IMPRESSED CURRENT SYSTEMS)						
Location Code *(see page 1)*	Structure Contact Points *(use one point per tank)* and Reference Cell Locations *(check minimum of 3 locations)*	Current On Voltage *(millivolts)*	Instant Off Voltage** *(millivolts)*	Final Voltage*** *(millivolts)*	Voltage Decay**** *(millivolts)*	Comments *(pass, fail, etc.)*
OPS Unique Tank # _____						
S __	Test station lead wire	----------	----------	----------	----------	
S __	Tank bottom	----------	----------	----------	----------	
R __	Pump manway					
R __	Tank monitor manway					
R __	Vapor recovery manway					
R __	Vent riser manway					
R __	Other _____*					
R __	Other _____*					
R __	Other _____*					
OPS Unique Tank # _____						
S __	Test station lead wire	----------	----------	----------	----------	
S __	Tank bottom	----------	----------	----------	----------	
R __	Pump manway					
R __	Tank monitor manway					
R __	Vapor recovery manway					
R __	Vent riser manway					
R __	Other _____*					
R __	Other _____*					
R __	Other_____*					
OPS Unique Tank # _____						
S __	Test station lead wire	----------	----------	----------	----------	
S __	Tank bottom	----------	----------	----------	----------	
R __	Pump manway					
R __	Tank monitor manway					
R __	Vapor recovery manway					
R __	Vent riser manway					
R __	Other _____*					
R __	Other _____*					
R __	Other _____*					
OPS Unique Tank # _____						
S __	Test station lead wire	----------	----------	----------	----------	
S __	Tank bottom	----------	----------	----------	----------	
R __	Pump manway					
R __	Tank monitor manway					
R __	Vapor recovery manway					
R __	Vent riser manway					
R __	Other _____*					
R __	Other _____*					
R __	Other _____*					

*Describe Location **Initial Voltage Drop Immediately After Rectifier Is Cut Off
***Native Potential ****Polarization

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Facility Name: _____ Facility I. D. Number: _____

DESCRIPTION OF REPAIRS

COMMENTS/CONCLUSIONS

TESTING INDICATES THAT CATHODIC PROTECTION SYSTEM
(IS) (IS NOT) *(Circle one)*
PROVIDING CORROSION PROTECTION TO THE TANK SYSTEM(S)

_____ _____
Signature of Person Conducting Test Type of Certification

_____ _____
Source of Certification Date of Certification

I certify under penalty of law that I am familiar with the information on this form and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

_____ _____
Signature of Owner Date

NEXT SCHEDULED TEST DATE (REQUIRED EVERY THREE YEARS)
Month: **Day:** **Year:**

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IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM
60-DAY INSPECTION LOG FOR YEAR _____

UST owners and operators must inspect impressed current cathodic protection systems every 60 days to ensure equipment is operating properly. This form should be maintained to document the date, inspector, and results of these inspections.

Owner Information	
Facility I.D. Number:	Owner:
Facility Name:	Address:
Address:	City, State, Zip Code:
City, County, Zip Code:	Phone Number:

Rectifier Information	
Location of Rectifier at Facility:	Rectifier Design Output (Amps):

INSPECTION LOG
Inspections are required at least every 60 days.

60 Day Inspection	Date Inspected	Inspector Initials	Rectifier Turned On?	Rectifier DC Output		Rectifier Clock Reading (Hours)
				Volts	Amps	
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Date of any Repairs	**Description of any Repairs**

Comments