

**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
CATHODIC PROTECTION MONITORING FORM FOR *IMPRESSED CURRENT SYSTEMS***

Questions on how to complete this form should be directed to the Groundwater Branch, UST Compliance Section at (334) 270-5655

1. Impressed Current cathodic protection systems must be tested:
  - a. In accordance with the latest edition code of practice established by the National Association of Corrosion Engineers (TM0101),
  - b. By a qualified cathodic protection tester within 1 month of installation and repair of any portion of the UST system, and every 3 years.
2. Please use photocopies of the appropriate pages if you have more than 4 tanks at any one location.
3. Please remove all pages that do not apply to the site.
4. Submit a completed form for all tanks and piping using cathodic protection within 30 days of completing the test by fax to (334) 270-5631, by e-mail to david.batchelor@adem.alabama.gov, or by mail to: *Alabama Department of Environmental Management, Groundwater Branch/UST Compliance Section, Post Office Box 301463, Montgomery, AL 36130-1463.*
5. The UST owner is required to keep a record of these tests for 3 years from the date of the test on a form acceptable to the Department.

Facility Information	Reason Testing Was Conducted (mark only one)
Facility Name:	<input type="checkbox"/> Routine test within 1 month of installation
Address:	<input type="checkbox"/> Routine 3-year test
City, County:	<input type="checkbox"/> Test within 1 month of repair
Owner Information	General Information
Owner:	Date of Testing:
Address:	Temperature:
City, State, Zip Code:	Weather Conditions:
Phone Number:	Tank Backfill Material:

**Underground Storage Tank Facility Site Drawing**

1. In the space below, sketch the important parts of the facility such as tanks, manways, fill pipes, tank monitor, vapor recovery connections, piping, vents, drilled test ports, anodes, rectifier box, anode shunt box, pump islands, and buildings.
2. 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) as used in the tables on the following pages.
3. For each tank, include ADEM unique tank number and/or product stored. Use the letter and number designations from the tables on the following pages to indicate reference cell locations and structure contact locations used for each measurement.

Facility I.D.# _____ - _____ - _____		CPTEST			
<b>Underground Storage Tanks Continuity Test Results (Impressed Current Systems)</b>					
1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 1. 2. Record continuity test measurements using the "Fixed Cell, Moving Ground Technique", or the structure-to-structure "Potential Difference Technique". 3. When using the "Fixed Cell, Moving Ground Technique": a. The reference cell must be placed in the soil at a location remote from the UST system (not within potential gradient of anodes or shielded by other tanks or structures) and left undisturbed until continuity testing is completed. b. Only "Instant-Off Potential" measurements should be used to determine continuity. 4. When using the structure-to-structure "Potential Difference Technique", power to the rectifier should be turned off. 5. If a continuity method fails to conclusively show continuity, another method may be used. If another method indicates continuity, the system passes. 6. Metallic structures are <u>continuous</u> when the "Instant-Off Potential" or "Off Potential" difference between two structures is 10 mv or less, <u>isolated</u> when greater than 10 mv. 7. All single and double wall metal tanks and piping, and all other metallic tank system structures which routinely contain product, <b>must be continuous with each other in order to pass the continuity test.</b>					
Location Code	Reference Cell Location and Structure Contact Points (Check all available points)	On or Off Potential❶ (negative millivolts)	Instant-Off Potential❷ (negative millivolts)	Results/Comments (Mark the one that does NOT apply)	
R 1	_____*				
Tank (# _____), ADEM Unique Tank # and/or Grade of Product Stored _____, Size in Gallons _____					
S _____	(Tank bottom)(test lead)(_____)**	- mv	- mv	(continuous)	(isolated)
S _____	Submersible pump	- mv	- mv	(continuous)	(isolated)
S _____	Fill pipe	- mv	- mv	(continuous)	(isolated)
S _____	Tank monitor	- mv	- mv	(continuous)	(isolated)
S _____	Vapor recovery connection	- mv	- mv	(continuous)	(isolated)
S _____	Vent line	- mv	- mv	(continuous)	(isolated)
S _____	Rectifier Negative	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
Tank (# _____), ADEM Unique Tank # and/or Grade of Product Stored _____, Size in Gallons _____					
S _____	(Tank bottom)(test lead)(_____)**	- mv	- mv	(continuous)	(isolated)
S _____	Submersible pump	- mv	- mv	(continuous)	(isolated)
S _____	Fill pipe	- mv	- mv	(continuous)	(isolated)
S _____	Tank monitor	- mv	- mv	(continuous)	(isolated)
S _____	Vapor recovery connection	- mv	- mv	(continuous)	(isolated)
S _____	Vent line	- mv	- mv	(continuous)	(isolated)
S _____	Rectifier Negative	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
Tank (# _____), ADEM Unique Tank # and/or Grade of Product Stored _____, Size in Gallons _____					
S _____	(Tank bottom)(test lead)(_____)**	- mv	- mv	(continuous)	(isolated)
S _____	Submersible pump	- mv	- mv	(continuous)	(isolated)
S _____	Fill pipe	- mv	- mv	(continuous)	(isolated)
S _____	Tank monitor	- mv	- mv	(continuous)	(isolated)
S _____	Vapor recovery connection	- mv	- mv	(continuous)	(isolated)
S _____	Vent line	- mv	- mv	(continuous)	(isolated)
S _____	Rectifier Negative	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)

❶ Record "On Potential" when using "Applied Current Technique" and "Off Potential" when using structure-to-structure "Potential Difference Technique".  
 ❷ The lowest reading observed during a 2.5 or 3 second power interruption. Not required for structure-to-structure "Potential Difference Technique".  
 \*Describe reference cell location for "Fixed Cell, Moving Ground Technique". N/A for structure-to-structure "Potential Difference Technique".  
 \*\*Indicate base structure contact point. Mark all that do NOT apply. Make sure tank is not internally lined before using tank bottom.  
 \*\*\*Describe location of any other contact points measured.

Facility I.D.# \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ CPTTEST

**Underground Storage Tanks Structure-to-Soil Test Results (Impressed Current Systems)**

1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 1.
2. For tanks, a minimum of 3 voltage measurements must be taken; one while the reference cell is placed in the soil as close to the middle of the tank as possible and the others while the reference cell is placed in the soil as close as possible to each end of the tank (but not directly over anodes).
3. **All single and double wall metal tanks and piping, and all metallic tank system structures which routinely contain product, must have "Instant-Off Voltage" measurements equal to or more negative than -850 mv, or have "Voltage Change" differences of at least 100 mv to be protected from corrosion and pass the structure-to-soil test.**

Location Code	Structure Contact Point and Reference Cell Locations	On Voltage (negative millivolts)	Instant-Off Voltage <sup>①</sup> (negative millivolts)	Ending Voltage <sup>②</sup> or Native Voltage <sup>③</sup> (negative millivolts)	Voltage Change <sup>④</sup> (millivolts)	Results (Mark the one that does NOT apply)
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Tank (# \_\_\_\_\_)

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

Tank (# \_\_\_\_\_)

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

Tank (# \_\_\_\_\_)

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

Tank (# \_\_\_\_\_)

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

- ① The lowest reading observed during a 2.5 or 3 second power interruption.
  - ② After power interruption, the first reading that is at least 100 mv lower than the "Instant-Off Voltage" measurement.
  - ③ The structure-to-soil potential prior to cathodic protection being applied. This may only be used to determine the "Voltage Change" at startup of the corrosion protection system.
  - ④ The difference between the "Instant-Off Voltage" and the "Ending Voltage" or "Native Voltage".
- \*Indicate base structure contact point. Mark all that do NOT apply. *Make sure tank is not internally lined before using tank bottom.*
- \*\*Describe location of any other reference cell locations used.

Facility I.D.# _____ - _____ - _____		CPTTEST			
Underground Metal Product Piping Continuity Test Results (Impressed Current Systems)					
1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 1. 2. Record continuity test measurements using the "Fixed Cell, Moving Ground Technique", or the structure-to-structure "Potential Difference Technique". 3. When using the "Fixed Cell, Moving Ground Technique": a. The reference cell must be placed in the soil at a location remote from the UST system (not within potential gradient of anodes or shielded by other tanks or structures) and left undisturbed until continuity testing is completed. b. Only "Instant-Off Potential" measurements should be used to determine continuity. 4. When using the structure-to-structure "Potential Difference Technique", power to the rectifier should be turned off. 5. If a continuity method fails to conclusively show continuity, another method may be used. If another method indicates continuity, the system passes. 6. Metallic structures are continuous when the "Instant-Off Potential" or "Off Potential" difference between two structures is 10 mv or less, isolated when greater than 10 mv. 7. All single and double wall metal tanks and piping, and all other metallic tank system structures which routinely contain product, <b>must be continuous with each other in order to pass the continuity test.</b>					
Location Code	Reference Cell Location and Structure Contact Points (Check all available points)	On or Off Potential <sup>1</sup> (negative millivolts)	Instant-Off Potential <sup>2</sup> (negative millivolts)	Results/Comments (Mark the one that does NOT apply)	
R 1	_____*				
Tank (# _____), Metal Piping, Type of Metal (steel) (copper)( _____ ) Approximate Length of Piping in Feet _____					
S _____	(Tank bottom)(test lead)( _____)**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
Tank (# _____), Metal Piping, Type of Metal (steel) (copper)( _____ ) Approximate Length of Piping in Feet _____					
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
Tank (# _____), Metal Piping, Type of Metal (steel) (copper)( _____ ) Approximate Length of Piping in Feet _____					
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	(Piping)(flex conn.) at dispenser # _____**	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)
S _____	Other _____***	- mv	- mv	(continuous)	(isolated)

<sup>1</sup> Record "On Potential" when using "Applied Current Technique" and "Off Potential" when using structure-to-structure "Potential Difference Technique".  
<sup>2</sup> The lowest reading observed during a 2.5 or 3 second power interruption. Not required for structure-to-structure "Potential Difference Technique".  
 \*Describe reference cell location for "Fixed Cell, Moving Ground Technique". N/A for structure-to-structure "Potential Difference Technique".  
 \*\*Indicate piping and/or flex connector. Mark any that do NOT apply.  
 \*\*\*Describe location of any other contact points measured.

Facility I.D.# \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ CPTTEST

**Underground Metal Product Piping Structure-to-Soil Test Results (Impressed Current Systems)**

1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 1.
2. Piping voltage measurements should be taken with the reference cell in the soil at both ends of the piping run (but not directly over anodes), and if the run is longer than 100 feet, in the soil as close as possible to the middle of the piping run (but not directly over anodes).
3. All single and double wall metal tanks and piping, and all metallic tank system structures which routinely contain product, must have "Instant-Off Voltage" measurements equal to or more negative than -850 mv, or have "Voltage Change" differences of at least 100 mv to be protected from corrosion and pass the structure-to-soil test.

Location Code	Structure Contact Point and Reference Cell Locations	On Voltage (negative millivolts)	Instant-Off Voltage <sup>①</sup> (negative millivolts)	Ending Voltage <sup>②</sup> or Native Voltage <sup>③</sup> (negative millivolts)	Voltage Change <sup>④</sup> (millivolts)	Results (Mark the one that does NOT apply)
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**Tank (# \_\_\_\_\_) Metal Piping**

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil at middle of piping run	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

**Tank (# \_\_\_\_\_) Metal Piping**

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil at middle of piping run	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

**Tank (# \_\_\_\_\_) Metal Piping**

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil at middle of piping run	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

**Tank (# \_\_\_\_\_) Metal Piping**

S _____	(Tank bottom)(test lead)(_____)*					
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil under dispenser # _____	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Soil at middle of piping run	- mv	- mv	- mv	+ mv	(pass) (fail)
R _____	Other _____**	- mv	- mv	- mv	+ mv	(pass) (fail)

- ① The lowest reading observed during a 2.5 or 3 second power interruption.
  - ② After power interruption, the first reading that is at least 100 mv lower than the "Instant-Off Voltage" measurement.
  - ③ The structure-to-soil potential prior to cathodic protection being applied. This may only be used to determine the "Voltage Change" at startup of the corrosion protection system.
  - ④ The difference between the "Instant-Off Voltage" and the "Ending Voltage" or "Native Voltage".
- \*Indicate base structure contact point. Mark all that do NOT apply. Make sure tank is not internally lined before using tank bottom.
- \*\*Describe location of any other reference cell location used.



