Underground Storage Tank Management Division
Galvanic (Sacrificial Anode) Cathodic Protection System Evaluation

- This form must be utilized to evaluate underground storage tank (UST) cathodic protection systems in South Carolina.
- Access to the soil directly over the cathodically protected structure that is being evaluated must be provided.
- A site drawing depicting the UST cathodic protection system and all reference electrode placements must be completed.

I. UST OWNER		II. UST FACILITY	
Name:		Name:	ID#:
Address:		Address:	
City:	State:	City:	County:

III. CP TESTER		IV. CP TESTER'S QUALIFICATIONS	
Tester's Name:		NACE International Certification#:	
Company Name:		Certification Date:	Type of Certification:
Address:		Source of Certification:	
City:	State:	Other (Explain):	

V. REASON SURVEY WAS CONDUCTED (mark only one)

☐ Routine-3 year ☐ Routine-within 6 months of installation ☐ 60-day re-survey after fail ☐ Re-survey after repair/modification
Date next cathodic protection survey must be conducted by _____(required within 6 months of installation/repair & every 3 years thereafter)

VI. CATHODIC PROTECTION TESTER'S EVALUATION (mark only one)

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (complete Section IX).
☐ INCONCLUSIVE	If the remote and the local do not both indicate the same test result on all protected structures (both pass or both fail), inconclusive is indicated and the survey must be evaluated and/or conducted by a corrosion expert (complete Section VII).

CP Tester's Signature:	Date CP Survey Performed:

VII. CORROSION EXPERT'S EVALUATION (mark only one)

The survey must be conducted and/or evaluated by a corrosion expert when: a) an inconclusive is indicated for any protected structure since both the local and the remote structure-to-soil potentials do not result in the same outcome (both pass or both fail); b) repairs to galvanized or uncoated steel piping are conducted or c) supplemental anodes are added to the tanks and/or piping without following an accepted industry code.

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (indicate what action is necessary by completion of Section IX)..

Corrosion Expert's Name:	Company Name:
NACE International Certification:	NACE International Certification #:
Corrosion Expert's Signature:	Date:

VIII. CRITERIA APPLICABLE TO EVALUATION (mark all that apply)

☐ 850 ON	Structure-to-soil potential more negative than –850 mV with respect to a $Cu/CuSO_4$ reference electrode with the protective current applied (This criterion is applicable to any galvanically protected structure).
☐ 850 OFF	Structure-to-soil potential more negative than –850 mV with respect to a $Cu/CuSO_4$ reference electrode with protective current temporarily interrupted (This criterion is applicable only to those galvanic systems where the anodes can be disconnected.
☐ 100 mV POLARIZATION	Structure tested exhibits at least 100 mV of cathodic protection. (This criterion is applicable to galvanic systems where the anodes can be temporarily disconnected.)

IX. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (mark only one)

☐ NONE	Cathodic protection is adequate. No further action is necessary at this time. Test again by no later than (see Section V).
☐ REPAIR	Cathodic protection is not adequate. Repair/modification is necessary as soon as practical but within the next 30 days.
☐ RETEST	Cathodic protection may not be adequate. Retest within 30 days or 6 months following a repair to determine if passing results can be achieved.

X. DESCRIPTION OF UST SYSTEM

Tank #	PRODUCT	CAPACITY	TANK MATERIAL	PIPING MATERIAL	FLEX CONNECTORS
1					
2					
3					
4					
5					
6					
7					
8					

XI. DESCRIPTION OF CATHODIC PROTECTION SYSTEM REPAIRS AND/OR MODIFICATION

Complete if any repairs or modifications to the cathodic protection system are made OR are necessary. Certain repairs/modifications as explained in the text of the SCDHEC cathodic protection guidance document are required to be designed and/or evaluated by a corrosion expert (completion of Section VII required).

☐ Supplemental anodes for a sti-P_3© tank (attach corrosion expert's design or documentation that industry standard was followed).

☐ Supplemental anodes for metallic pipe (attach corrosion expert's design or documentation that industry standard was followed).

☐ Galvanically protected tanks/piping not electrically isolated (explain in "Remarks/Other" below).

Remarks/Other: _____

_____

_____

_____

_____

XII. UST FACILITY SITE DRAWING

Attach detailed drawing or use the space provided to draw a sketch of the UST and cathodic protection systems. Sufficient detail must be given in order to clearly indicate where the reference electrode was placed for each structure-to-soil potential that is recorded on the survey forms. Any pertinent data must also be included. At a minimum you should indicate the following: All tanks, piping and dispensers; All buildings and streets; All anodes and wires; Location of CP test stations; Each reference electrode placement must be indicated by a code (1,2,3 R-1, R-2, R-3…etc.) corresponding with the appropriate line number in Section XVI of this form.

AN EVALUATION OF THE CATHODIC PROTECTION SYSTEM IS NOT COMPLETE WIHTOUT AN ACCEPTABLE SITE DRAWING.

XIII. GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM CONTINUITY SURVEY

- This section may be utilized to conduct measurements of continuity on underground storage tank systems that are protected by cathodic protection systems.
- When conducting a fixed cell-moving ground survey, the reference electrode must be placed in the soil at a remote location and left undisturbed.
- Conduct point-to-point test between any two structures for which the fixed cell-moving ground survey is inconclusive or indicates possible continuity.
- For galvanic systems, the structure that is to be protected must be isolated from any other metallic structure in order to pass the continuity survey.

Facility Name:	NOTE: The survey is not complete unless all applicable parts of Sections I-XIV are also completed.

Describe Location of "Fixed Remote" Reference Electrode Placement:

Structure "A"[1]	Structure "B"[2]	Structure "A"[3] Fixed Remote Voltage	Structure "B"[4] Fixed Remote Voltage	Point-to-Point[5] Voltage Difference	Isolated/ [6] Continuous/ Inconclusive
(example) Plus Tank Bottom	(example) Plus Tank Fill Riser	(example) -921 mV	(example) --915 mV	(example)	(example) Inconclusive
(example) Plus Tank Bottom	(example) Plus Tank Fill Riser			(example) 17 mV	(example) Isolated

1 Describe the cathodically protected structure ("A") that you are attempting to demonstrate is isolated from unprotected structures (e.g. plus tank bottom).
2 Describe the unprotected structure ("B") that you are attempting to demonstrate is isolated from the protected structure (e.g. plus tank fill riser.
3 Record the measured structure-to-soil potential of the protected structure ("A") in millivolts (e.g. –921 mV).
4 Record the measured structure-to-soil potential of the unprotected structure ("B") in millivolts (e.g. –915 mV).
5 Record the voltage difference observed between the protected and the unprotected structures when conducting "point-to-point" testing (e.g. 17 mV).
6 Document whether the test (fixed cell and/or point-to-point) indicated the protected structure was isolated, continuous, or inconclusive.

XIV. GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM SURVEY

- This section may be utilized to conduct a survey of a galvanic cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly over the tested structure (local) **and** 25-100 feet away from the structure (remote).
- Both the local and the remote voltage must be –850 mV or more negative, in order for the structure to pass.
- Inconclusive is indicated when both the local and the remote structure-to-soil potentials do not result in the same outcome (both pass or both fail).

Facility Name:

NOTE: The survey is not complete unless all applicable parts of Sections I-XIV are also completed.

Location Code[1]	Structure[2]	Contact Point[3]	Local Reference Cell Placement[4]	Local Voltage[5]	Remote Voltage[6]	Pass/Fail[7] /Inconclusive
(example) 1	(example) Plus Tank	(example) Tank Bottom	(example) Plus Tank STP Manway	(example) -928 mV	(example) -810 mV	(example) Inconclusvie
(example) 2	(example) Plus Piping	(example) Dispenser 5/6	(example) Under Dispenser 5/6	(example) -890 mV	(example) -885 mV	(example) PASS

Comments: _____

_____

_____

_____

1 Designate numerically or by code on the site drawing each "local" reference electrode placement (e.g. 1,2,3… T-1, T-2, P-1, P-2, etc.).
2 Describe the structure that is being tested (e.g. plus tank; premium piping; diesel STP flex connector, etc.).
3 Describe where contact with the structure that is being tested is made (e.g. plus tank @ test lead; diesel piping @ dispenser 5/6; tank test lead; pp4, etc.)
4 Describe the exact location where reference electrode is placed for each “local” measurement (e.g. soil @ plus tank STP; soil @ dispenser 5/6, etc.)
5 Record the structure-to-soil potential measured with the reference electrode placed “local” in millivolts (e.g. –865 mV, -920 mV, etc.)
6 Record the structure-to-soil potential measured with the reference electrode placed “remote” (copy voltage that was obtained during continuity survey).
7 Indicate whether the tested structure passed or failed the –850 mV “on” criterion based on your interpretation of the test data.