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May 20, 2024

Mr. Ken Tutt
Project Representative
Nutrien Ltd.
SCC Sulfuric Acid Plant
15843 SE 78th Street
White Springs, Florida 32096-2703

RE: CATHODIC PROTECTION SURVEY
SCC SULFURIC ACID PLANT
2024 RECOMMENDATIONS

Dear Mr. Tutt;

Please review the general recommendations concerning the results of the Nutrien Ltd. – SCC Sulfuric Acid Plant cathodic protection survey, performed beginning May 17, 2024. The following recommendations were cited during this inspection:

- Obtained cathodic protection measurements indicate approximately 100% of the steel gas system piping components currently meet or exceed the minimum CP requirements required by State and Federal regulatory agencies.
- No structure-to-soil readings were obtained from the single cathodic test point due to the destruction of the only CTP (see attached photo) on this system. Recommend replacing this CTP.

I trust the information to be in sufficient detail, however, should you require additional information or would like to discuss these recommendations, please contact me. A copy of this report is available online at www.cityservices.biz. Click on Clients → Nutrien → Corrosion Surveys. To obtain or change your username and password, contact us at 229.226.6569.

Sincerely,

A handwritten signature in black ink that reads 'W. L. Hays'.

W. L. Hays
CITY SERVICES, INC.



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May 2024

Nutrien Ltd.
SCC Sulfuric Acid Plant
15843 SE 78th Street
White Springs, Florida 32096-2703
ATTN: Mr. Ken Tutt
Project Representative

SCC Sulfuric Acid Plant
2024 Cathodic Protection Survey

Effectiveness of Underground Cathodic Protection

INTRODUCTION

The annual cathodic protection survey was conducted for Nutrien Ltd. – SCC Sulfuric Acid Plant beginning May 17, 2024. During this survey, the SCC Sulfuric Acid Plant natural gas distribution system was inspected for the effectiveness of cathodic protection, as applied. The cathodic protection system for the SCC Sulfuric Acid Plant consists essentially of Galvomag Magnesium anodes placed in various locations throughout the natural gas system.

RESULTS AND ANALYSIS

STRUCTURE READINGS: 1 STRUCTURE-TO-SOIL POTENTIAL: -0.850 Vdc
ANODE READINGS: 0

A total of One [1] structure reading and Zero [0] anode readings were taken during this survey. As can be seen by the structure-to-soil potential measurements and the enclosed data sheet, the structure-to-soil pipeline reading obtained at the 8" gas Riser is indicative of cathodic protection. A structure-to-soil potential of 850 millivolts [-0.850] or more negative direct current is the basis used in this report to confirm cathodic protection. The green anode connection, green gas pipeline connection and green/black gas pipeline connection were found destroyed and unusable.



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NUTRIEN LTD.

SCC Sulfuric Acid Plant

CATHODIC PROTECTION SURVEY
MAY 2024

CATHODIC PROTECTION SURVEY
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NUTRIEN
SCC
Sulfuric Acid Plant

2024

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SURVEY TEST INSTRUMENTATION

- Gas Electronics Model 601 Insulation Checker
- Fluke Model 71 Digital Multi-meter
- Tinker & Rasor 6-B Reference Electrode [CSE]
- Cu/CuSO₄ Reference Electrode Calibration 05/06/2024 – 2.1 Mvdc

IR DROP CONSIDERATION

Aging pipes and changing conditions can cause significant problems, such as an increase in applied CP levels and enlarged holidays in coating. In addition, increased environmental concerns also emphasize the need to minimize leaks as much as possible.

The effectiveness of any cathodic protection system can be determined by taking potential measurements between the structure and a reference electrode. These potential measurements have traditionally been recorded with “average reading” digital voltmeters while the protective current is flowing or applied. These potential measurements contain the error produced by the voltage drop in the soil (electrolyte resistance) and the voltage drop (current) in the structure being protected. This error is referred to as IR drop. Interpretation of a current applied measurement requires consideration of the significance of voltage drops in the earth and metallic paths.

An IR drop is a voltage across a resistance, in accordance with Ohm’s law ($V=IR$). Although there are several IR drops in a structure-to-electrolyte potential circuit, the IR drop of most concern is that which occurs between the reference electrode (half-cell) and the structure-to-electrolyte (pipe) boundary. This IR drop is due to a CP current in the resistance of the electrolyte and is an error in the measurement.

One way to reduce the IR drop is to bring the reference electrode close to the structure (pipe) to reduce the resistance of the electrolyte (soil). Another way to reduce the IR drop is to bring the current to zero by interrupting all sources of current (anodes) influencing that reference point at the same precise time.

RECOMMENDATIONS

The sacrificial galvanic anode arrangement designed to protect the coated and wrapped steel natural gas system indicates adequate current to afford cathodic protection to the steel distribution system. No Structure-to-soil readings were obtained from One [1] Cathodic Test Point due to destruction of the CTP. One [1] Eight-inch [8"] gas riser on the steel distribution system indicates cathodic protection readings of -1.091 volts direct current, which is above State and Federal minimum standard requirement of -0.850 volts direct current.

The coated and wrapped Riser on the gas distribution system indicates a minimum/maximum structure-to-soil potential of -1.091 vdc. No anode readings or gas pipeline structure-to-soil potential readings were obtained due to the destruction of the lone Cathodic Test Point in the SCC Sulfuric Acid Plant distribution system. Continuity over the entire main line system is good to excellent.

At this time, the Natural Gas Distribution System for Nutrien Ltd. SCC Sulfuric Acid Plant complex indicates cathodic protection levels exceeding State and Federal minimum guidelines for applied cathodic protection. The single distribution main Cathodic Test Point requires replacement to obtain future readings as required. I trust the above information to be satisfactory and in sufficient detail, however, should you require additional information, please contact me.

Sincerely,



Mitchell Whitfield, CP Tester
City Services, Inc.

CATHODIC TEST POINTS

**Cathodic Test Points (CTP)
System**

Underground Natural Gas

Test Location		
Green Anode Connection	-0.000	Vdc*
Green/Black Gas Pipeline Connection	-0.000	Vdc*
Green Gas Pipeline Connection	-0.000	Vdc*
Structure-to-Soil 8" Riser	-1.091	Vdc*

CATHODIC TEST POINT FOUND DESTROYED
SEE EXHIBIT A ON PAGE 5

