Close Interval Survey Analysis Start to Finish

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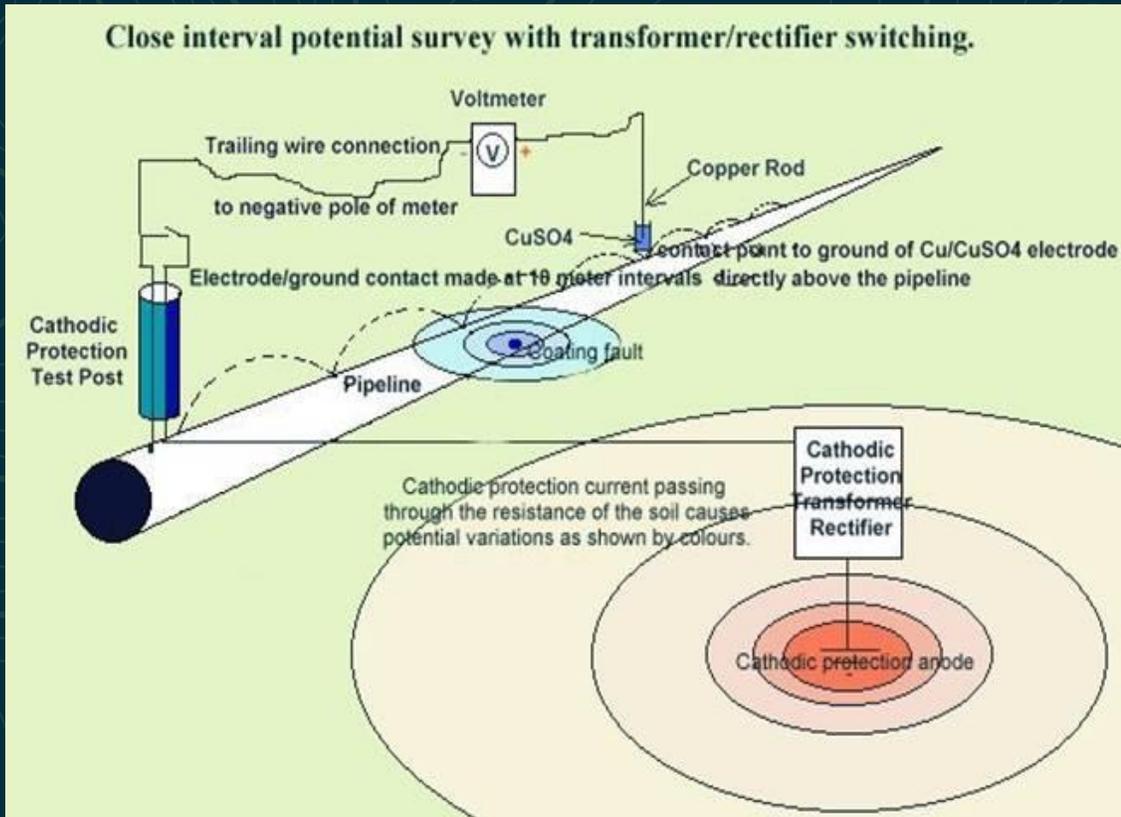Matt.archer@HRGroup1.com

Close Interval Survey Analysis is an integral part of the CIS program and is incorporated through all phases of the project.

What is Close Interval Survey ?

Close interval potential survey with transformer/rectifier switching.

Voltmeter

Trailing wire connection
to negative pole of meter

Copper Rod

CuSO4

contact point to ground of Cu/CuSO4 electrode

Electrode/ground contact made at 10 meter intervals directly above the pipeline

Cathodic
Protection
Test Post

Pipeline

Coating fault

Cathodic protection current passing through the resistance of the soil causes potential variations as shown by colours.

Cathodic
Protection
Transformer
Rectifier

Cathodic protection anode

Close Interval Survey Analysis

Data analysis plays a vital role throughout the project

- Project Planning
- Execution
- Final Report
- Remediation

Project Planning / Development

How does analysis affect project planning and Development?

- Determines the type of survey needed
- The purpose of the CIS
  - CIS cannot identify corrosion or severity of corrosion.
- Utilizes past projects/data to determine the amount information needed and develops a comprehensive plan that addresses all details.
  - Notifications
  - Change Orders
  - Equipment Needed
  - Reports
  - Roles and Responsibilities

Execution

- Once you have established a Project Plan and awarded the work, you should perform continuous analysis during the execution phase.

Execution

- What will help you analyze the day to day operations of a CIS?

- Types of reports
  - Daily Progress Reports
  - Daily Raw Data Graphs
 - Weekly Progress reports and tracking

Ambient Temp:	70			Soil Conditions:		damp	

Reference Cell Calibrations(mV)	0mv			Number of Interrupters set:		12	

Line Name/Number	MP Start	MP Finish	Miles Complete (running total)	% Field Work Complete (running	Description of Work (For DCVG/ACVG surveys indicate number of anomalies found and running total)
███████████	14	18	45	12	CIS

Previous Day P/S	Current Day P/S	Location
-2.308	-2.315	MP 14
-1.102	-1.097	

Wire Collected?	Yes	Amount of Wire collected?	4

Personnel		Mobilization	Test Station Verifi	Locate Line	CI Survey	Interrupt Rectifier	Anode Disconnect	Delay	Total Hours
Employee Name	Classification								
Keith Broesche	Operator	2				8			10
Kyle Rayon	Locator	2		8					10
Peng Chum	Wire Puller	2		8					10

Truck Number	Daily Mileage	Truck Number	Daily Mileage	Truck Number	Daily Mileage

Special Equipment Used	Mileage/Hours	Schedule(Ahead/On/Behind	
		Anticipated Completion date	

| Detailed description of work completed with problems encountered: |
|---|
| |
| Started surveying from mile post 14 up to mile post 18. Had some broken wires from deer and cattle. Stopped at a road about 500 ft after a test station. It was getting late and we wouldn't have vehicle access for the next 6 miles. |

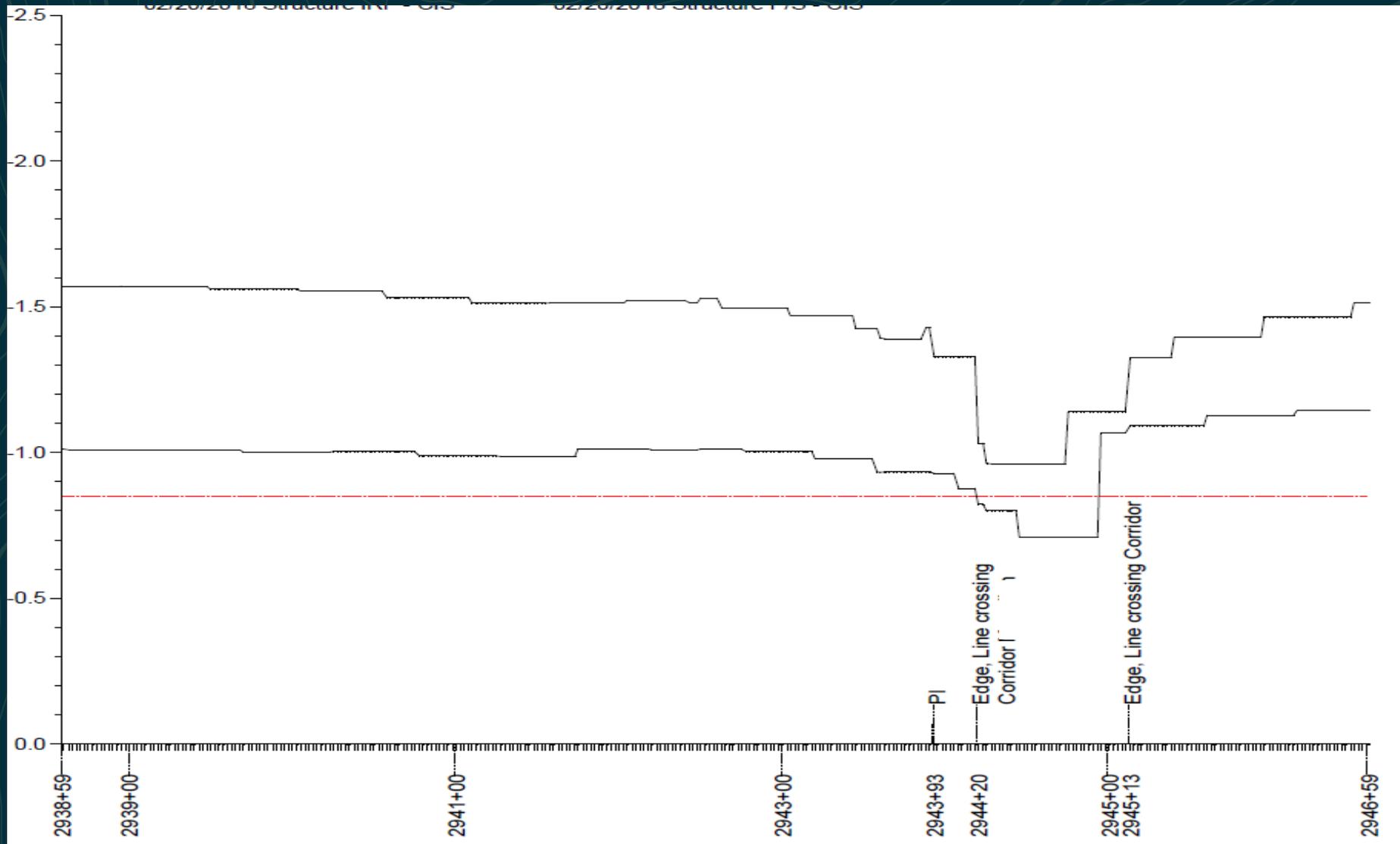# Raw Data Graph - Inversion
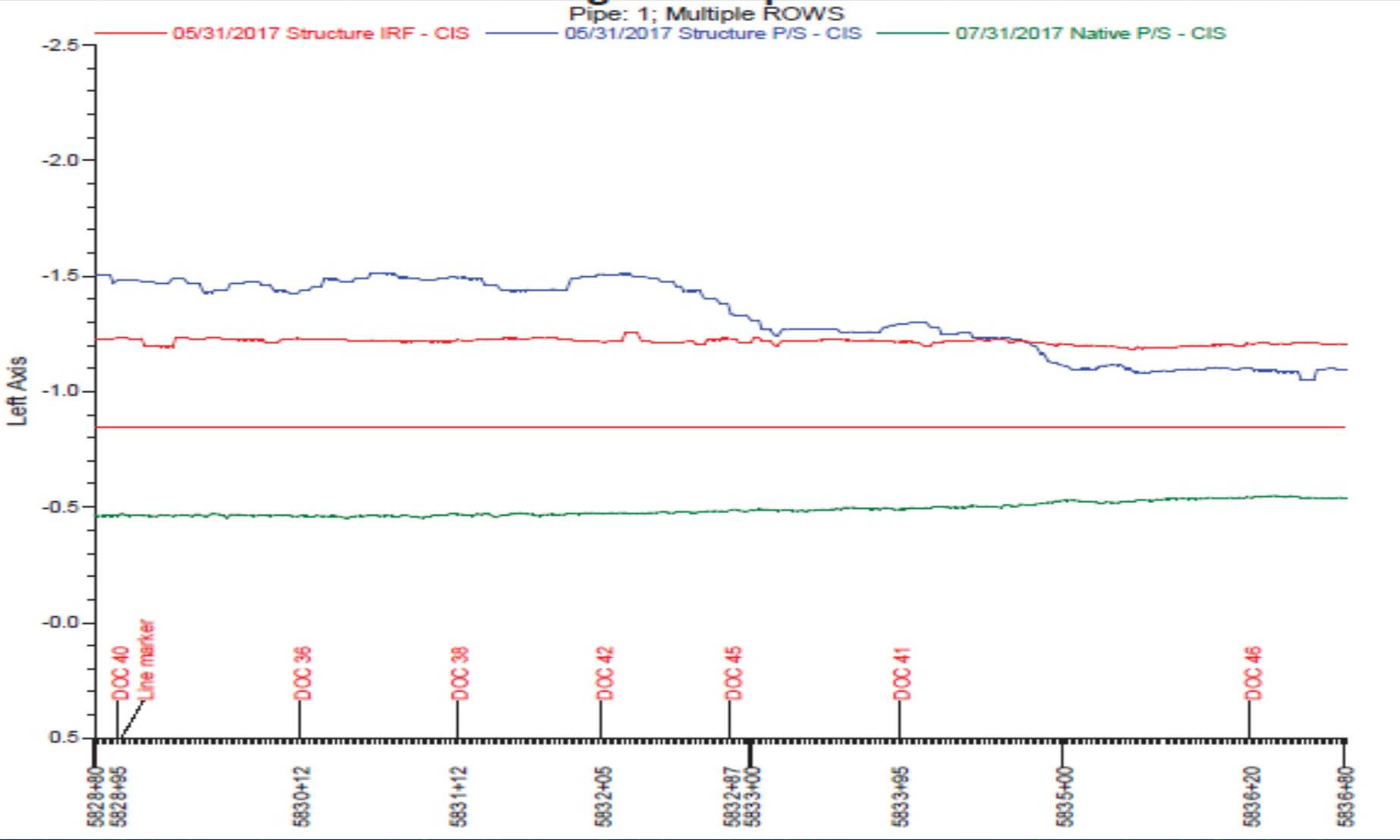
Raw Data Graph – Telluric Currents
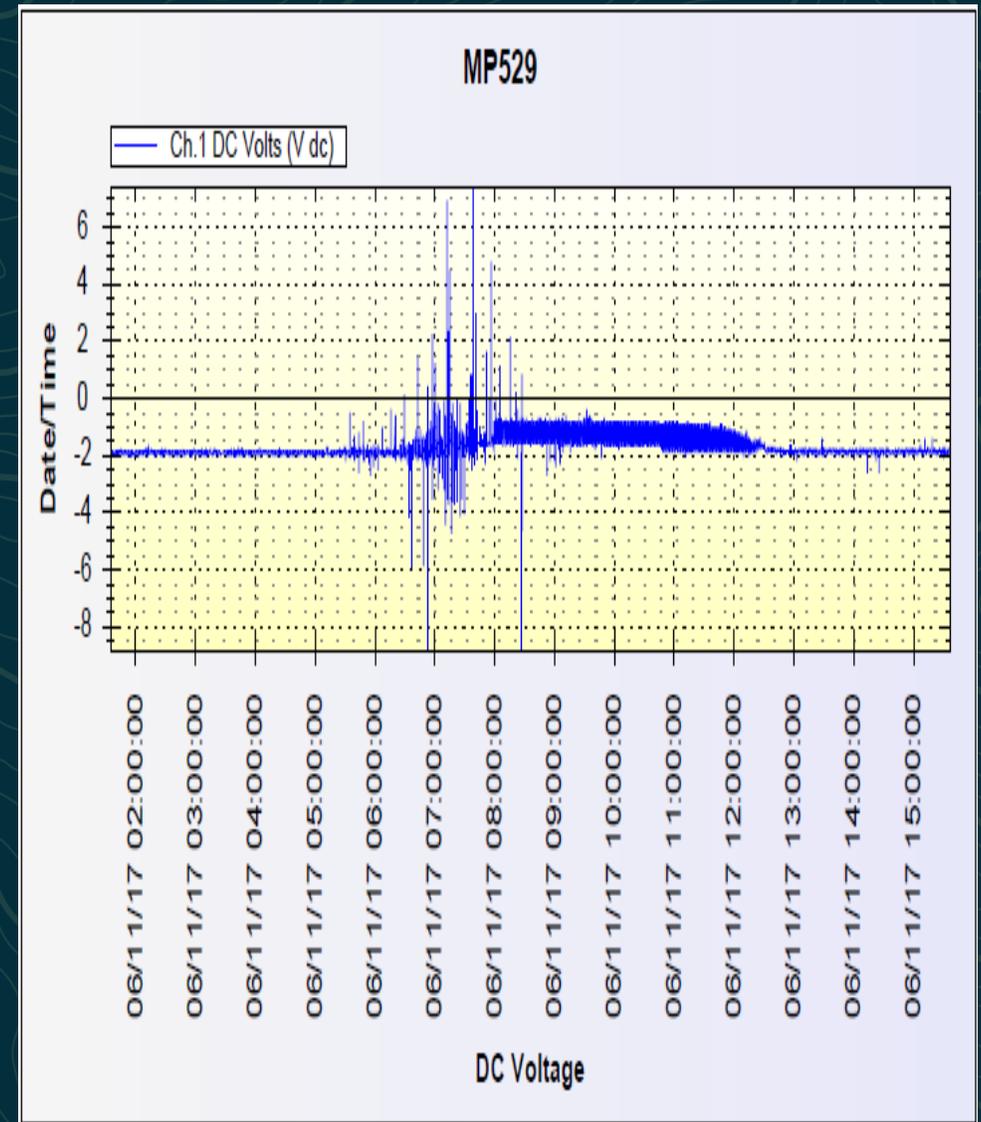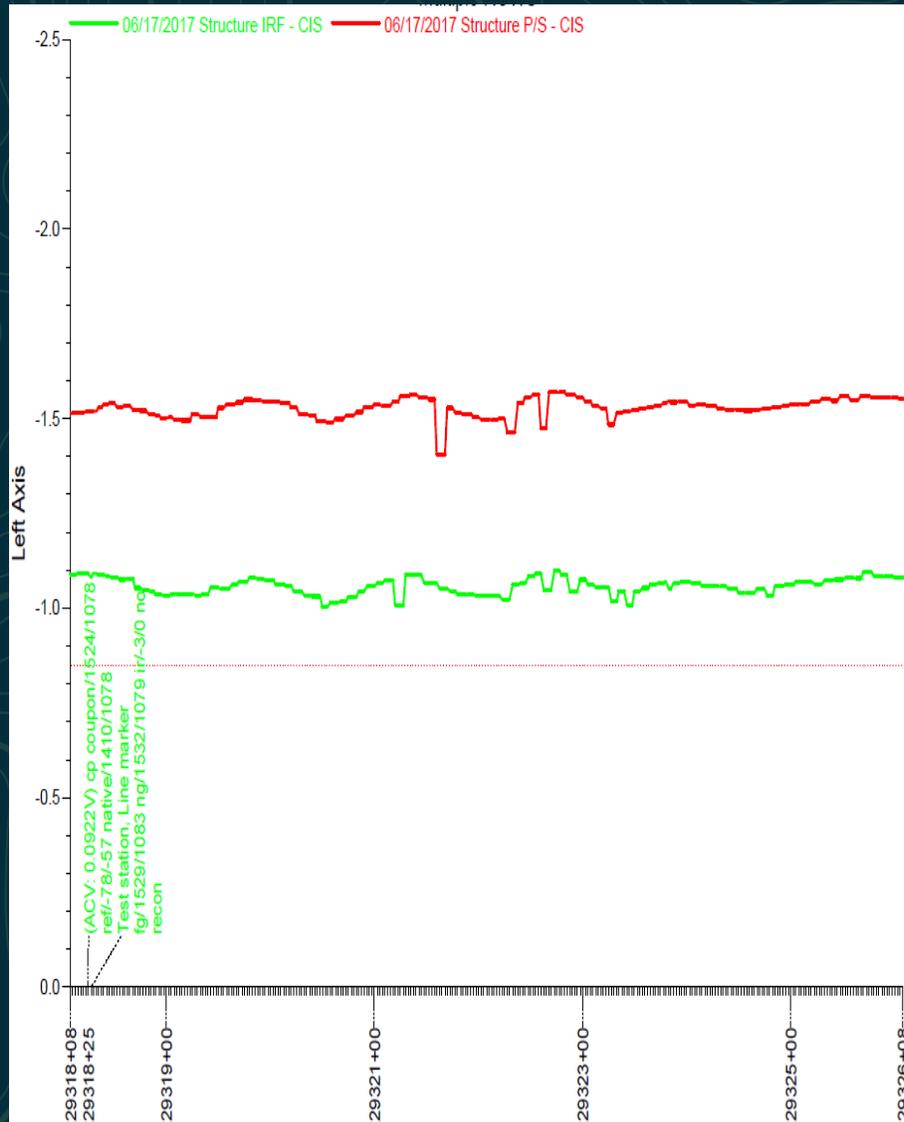
Raw Data Graph – Positive Reads
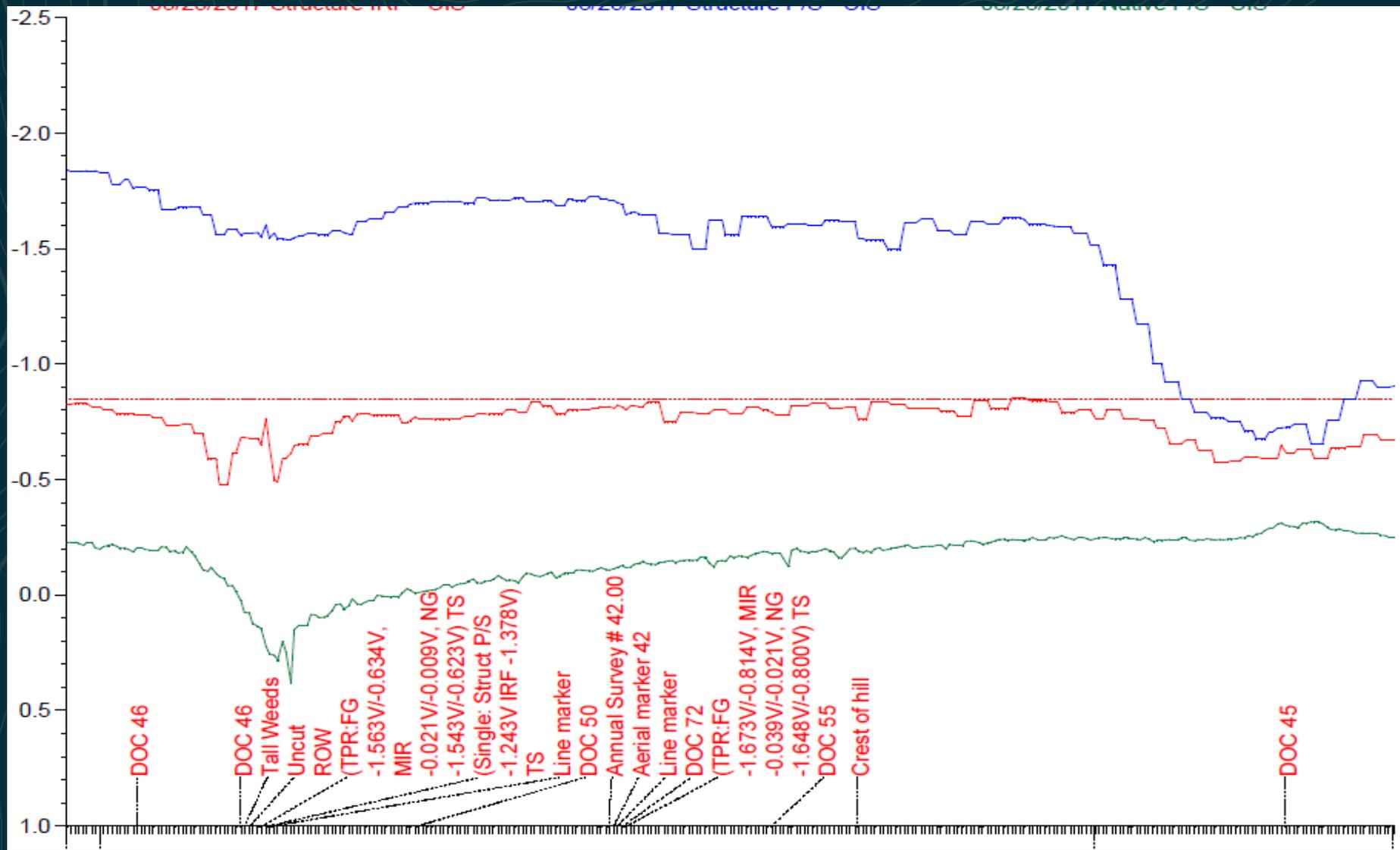
Example 1

Example 1

Final Reporting

Of all the phases, Data Analysis is most attributed to the Final Reporting Stage.

This is the stage where all the reports are compiled, delivered to the operator, and reviewed by the operator.

It is also the stage where the operator will develop a course of action to address deficiencies.

Final Reporting

A comprehensive CIS program will determine the accuracy of the report and identify issues by:

- Requiring ALL data be turned over along with the final report

- Ensuring all required reports are present in the format required

- Comparing exceptions reports to final graphs and spreadsheets

- Reviewing the final graph page by page to identify additional issues not called out in the exception reports

- Compiling the findings to determine corrective actions.

DO NOT TAKE FINAL REPORTS AT FACE VALUE!

Exceptions Vs Actual Data

Cathodic Protection Related Deficiency

100 mV Shift Criteria

Station		Distance (ft)	Location	Begin		End	
Begin	End			Latitude (Y)	Longitude (X)	Latitude (Y)	Longitude (X)
2044+02	2044+07	5					
2101+10	2101+30	20					
2365+82	2365+85	3					
2530+70	2530+72	2					
2533+47	2533+70	23					
2640+22	2640+37	15					
3432+90	3432+92	2					
4638+70	4638+70	2					

							Location						
3647	CIS Sta 17!	2101+02	-2.522	-1.127	-0.472	Start Run	36.68254	-96.1987	900	Shaun	#########	########
3648	CIS Sta 17!	2101+05	-2.52	-1.123	-0.472	(Single: St	36.68254	-96.1987	903	Shaun	#########	########
3649	CIS Sta 17!	2101+07	-2.517	-1.124	-0.484	(SKIP) Seg	36.68254	-96.1987	904	Shaun	#########	########
3650	CIS Sta 17!	2101+10			-0.484	E				Shaun	#########	########
3651	CIS Sta 17!	2101+12			-0.484	TREC 1mV				Shaun	#########	########
3652	CIS Sta 17!	2101+15			-0.48	REC 2mV				Shaun	#########	########
3653	CIS Sta 17!	2101+17			-0.486	Surveyor !	36.68267	-96.199	903	Shaun	#########	########
3654	CIS Sta 17!	2101+20			-0.483	Locator Tyler				Shaun	#########	########
3655	CIS Sta 17!	2101+22			-0.483	Wire Garrett				Shaun	#########	########
3656	CIS Sta 17!	2101+25			-0.482	Sunny 72Deg Dry Rocky Soil Matted Grass				Shaun	#########	########
3657	CIS Sta 17!	2101+27			-0.482	Pasture				Shaun	#########	########
3658	CIS Sta 17!	2101+30			-0.464	Insulating Flange No				Shaun	#########	########
3659	CIS Sta 17!	2102+55	-2.453	-1.102	-0.473	(SKIP)	36.6829	-96.1989	899	Shaun	#########	########
3660	CIS Sta 17!	2102+57	-2.452	-1.102	-0.459	(Single: St	36.68291	-96.1989	903	Shaun	#########	########
3661	CIS Sta 17!	2102+60	-2.445	-1.1	-0.475	(TPR:FG -2	36.68291	-96.1989	901	Shaun	#########	########
3662	CIS Sta 17!	2102+60	-2.445	-1.1	-0.475	(ACV: 2.35	36.68291	-96.1989	901	Shaun	#########	########
3663	CIS Sta 17!	2102+62	-2.456	-1.096	-0.46		36.68294	-96.1989	902	Shaun	#########	########

Final Report Graphs
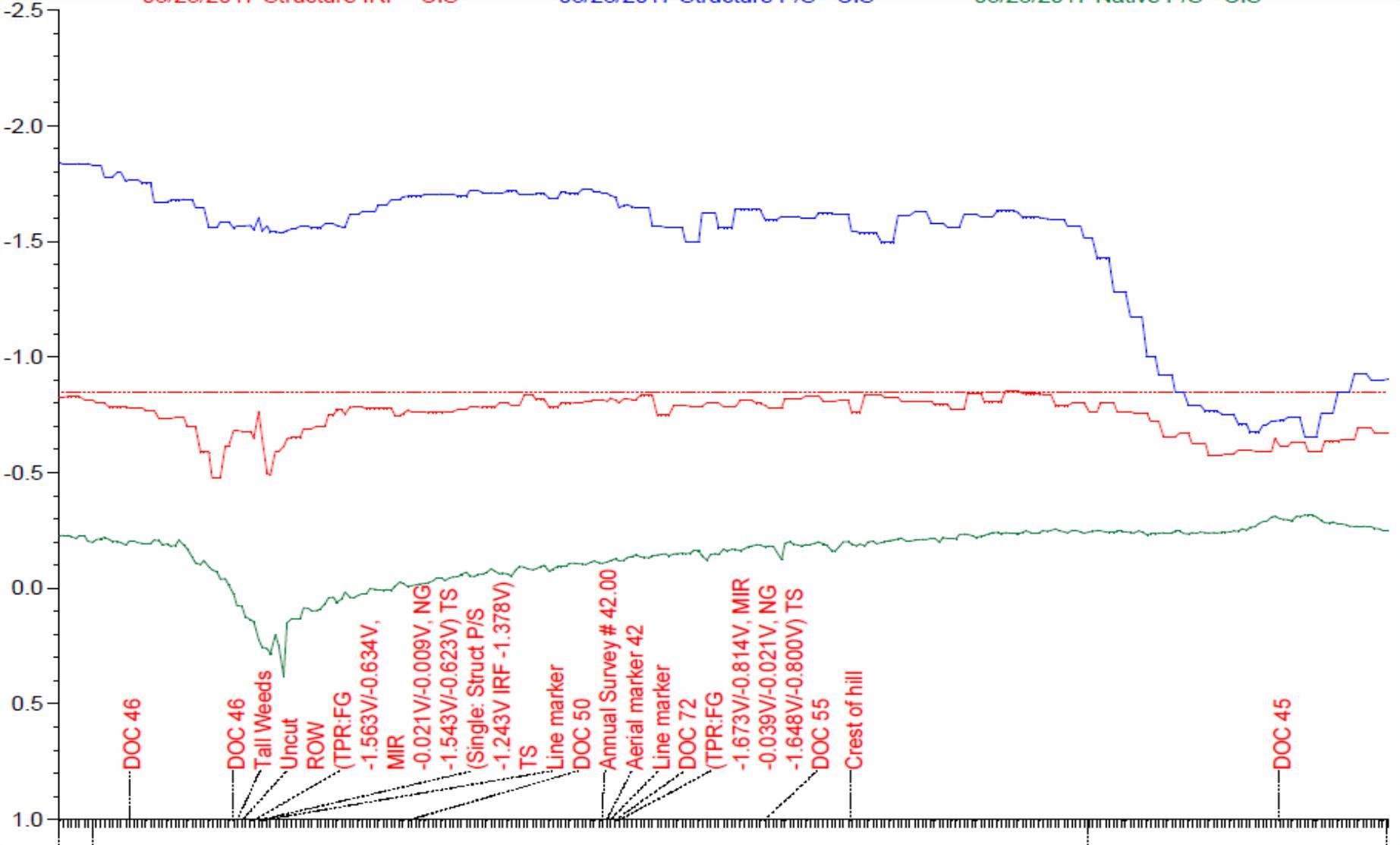
Thorough analysis of CIS data is an integral part of an effective program that is applied through all stages of a Close Interval Survey project and should be performed by someone who has strong understanding of what is required to develop, perform, and review the CIS.

Question & Discussion