

ELECTROLYSIS RISK ASSESSMENT REPORT
URBAN PROPERTY GROUP
LOT 8 (SITE 5) BUCHAN AVENUE, EDMONSON PARK NSW 2174

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PURPOSE AND SCOPE

This document was developed to address the following requirements:

- To outline the methodology Corrosion Control Engineering employees followed during the electrolysis assessment
- Present and discuss the results of the assessment
- Provide recommendations to mitigate against stray current corrosion

DISTRIBUTION

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DOCUMENT CONTROL

REVISION	DATE	REASON FOR ISSUE	PREPARED	QUALITY CHECK	TECHNICAL APPROVAL
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New document

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1. Introduction

Corrosion Control Engineering (Holdings) Pty Ltd was engaged to assess the electrolysis risk at Lot 8 (Site 5) Buchan Avenue, Edmondson Park prior to the construction of the proposed development. As requested, on Thursday, the 11th of December 2025 and Friday, the 12th of December 2025, CCE conducted testing on site to measure the stray traction currents due to the Leppington & Inner West Line (T2) and the Cumberland Line (T5).

This electrolysis risk report is submitted to the Department of Planning, Housing and Infrastructure (DPHI) on behalf UPG Edmondson Parkland Pty Ltd (UPG) (the Applicant), to support a State Significant Development Application (SSDA) and Concurrent Rezoning Report for the construction of a new multi stage residential project at Lots 4-5, 6-7, and 8 Buchan Avenue, Edmondson Park (known as Sites 3, 4 and 5) (the site). The proposed development comprising a mix of shop-top housing, residential flat buildings (RFB), co-living housing, and affordable housing, together with public domain improvements including a new publicly accessible plaza, a public library and through-site pedestrian links.

The project has been identified by the NSW Housing Delivery Authority (HDA) as a key development to accelerate the delivery of well-located, diverse and affordable housing across Greater Sydney, with the HDA playing a coordinating role across government agencies to unlock complex sites through strategic planning, infrastructure coordination and streamlined assessment pathways. On 19 February 2025, the HDA recommended that the proposed development on Sites 4 and 5 (6–7 and 8 Buchan Avenue, Edmondson Park), as outlined in EOI application 232588 dated 17 January 2025, be declared State Significant Development (SSD) under section 4.36(3) of the Environmental Planning and Assessment Act 1979, followed by a similar recommendation on 2 June 2025 for Site 3 (4–5 Buchan Avenue, Edmondson Park) as described in EOI application 246574 dated 14 March 2025. These recommendations were formalised through the Minister’s issuance of State Significant Development Declaration Order (No. 9) 2025 on 12 June 2025, with the proposals to be facilitated by a concurrent amendment to the State Environmental Planning Policy (Precincts – Western Parkland City) 2021.

2. The Proposal

2.1 Rezoning Proposal

To facilitate the proposed development described in Section 2.2, a Rezoning Proposal is sought to seek the following amendments to the State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (Precincts SEPP):

- Amend the Height of Buildings Map to apply a suite of maximum building heights across the site, ranging from 52m – 135m;
- Amend the Floor Space Ratio Map to apply maximum FSRs of 3.7:1 - 5.4:1 across the site;
- Remove the requirement for a Development Control Plan for the site;
- Permit development for the purposes of ‘commercial premises’ on Site 5.

2.2 State Significant Development Application

The proposed amendments to the Precincts SEPP, as outlined above, will facilitate the following development, sought via a concurrent SSDA. Specifically, the proposed works sought under the SSDA include:

- Construction of fourteen residential towers (ranging in height between 6 to 40 storeys) over five podiums (ranging in height between 2-5 storeys), comprising:
 - Mixed use podiums in Site 5.

Public library in Site 3.

A total of 1,805 residential apartments located above in a combination of build-to-sell, affordable, and co-living formats.

Basement car parking.

Associated landscaping and public domain improvements, including a new publicly accessible plaza, public library and through-site links.

It is noted that the project will commit to providing 15% of the GFA as affordable housing for a minimum of 15 years, to be managed by a registered Community Housing Provider (CHP).

For a detailed description of the proposed development, refer to the Environmental Impact Statement (EIS) prepared by Beam Planning, and the Architectural Drawings prepared by Plus Architecture.

3. The Site

The combined site is located at 4-5, 6-7, and 8 Buchan Avenue, Edmondson Park, and is legally described as Lots 4, 5, 6, 7 and 8 in DP1275478. The site has a total area of approximately 3.1 hectares, with a primary street frontage of approximately 298m to Buchan Avenue, and a secondary street frontage of approximately 186m to Horrie Road. The combined site is owned by UPG Edmondson Parkland Pty Ltd.

The site is located approximately 330m from the Edmondson Park Train Station and directly adjacent to a future high school (currently under construction). The site is also approximately 400m northwest of Frasers Ed Square Town Centre, placing it in a highly accessible and active urban precinct. The site and its surroundings are currently undeveloped presenting a significant opportunity for coordinated and well-integrated urban development.

It is noted that earthworks, subdivision, and the construction of the major and minor roads surrounding the site has been undertaken under previous development consents.

Figure 1 below provides an aerial image for the site. Figure 2 shows the local plan.



Figure 1 Aerial view of the site

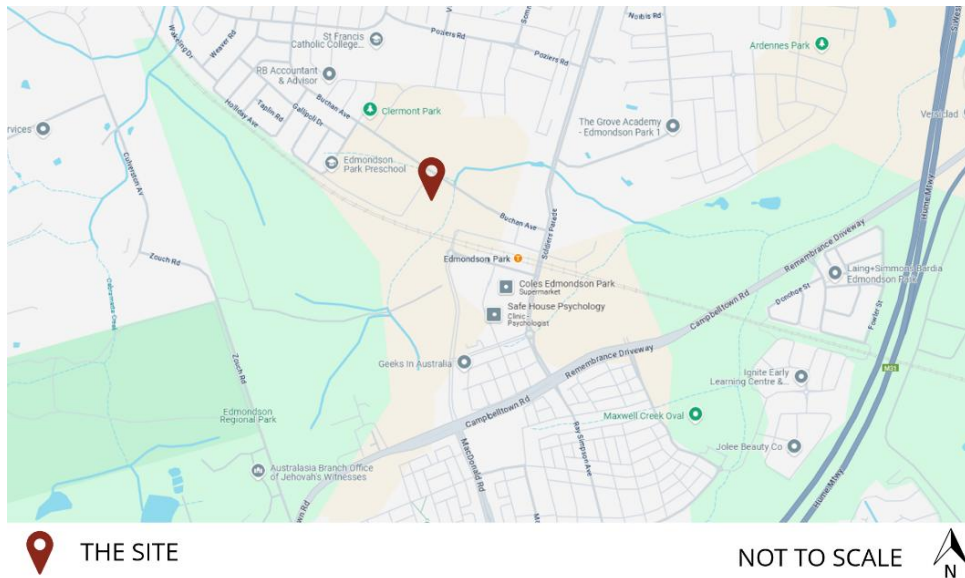


Figure 2 Location plan

4. The Electrolysis Problem

Most of the DC current to power the electric trains (trains, metro, and light rail) returns to the railway substations via the rail lines. However, some leaks to ground (stray traction current) and in returning to the substation via this path can be picked up (and discharged) from buried metallic structures, leading to possible electrolysis type corrosion problems. This corrosion of the metal occurs at the discharge point.

The problems can be significant if:

- The metallic structures are sufficiently large or long enough and close to the electrified railway lines.
- The stray traction current leakages to soil are of sufficient frequency and magnitude

5. Test Method

The in-ground stray traction, causing voltage fluctuations on the development site, was monitored by data logging voltage gradients and potentials with reference to Cu/CuSO_4 as follows:

1. Data logging voltage gradients between steel earth stakes parallel to the rail.
2. Data logging voltage gradients between steel earth stakes perpendicular to the rail.
3. Data logging potential of the street boundary fence.
4. Data logging potentials of a fence parallel to the rail.

Note: TfNSW standard 'THRCI 12051 ST: Development Near Rail Tunnels, Version 2.0', and Sydney Metro Guideline 'Sydney Metro Underground Corridor Protection Technical Guidelines, Version 2.0', does not provide any acceptance criteria for stray current effects. The NSW Electrolysis Committee

adopts acceptance criteria (low risk) of 20 mV anodic and 100 mV cathodic time weighted average shift over a period of up to 24 hours. Given there are no specified mitigation methods, the conclusions and recommendations in this report are based on CCE's experience in this field.

6. Test Results

A summary of the test results is presented in the following table. The corresponding data logger charts are presented in Appendix A.

Test Number	Data Logging Test Performed	Test Duration	Observed Fluctuations
1	Data logging voltage gradients between steel earth stakes parallel to the rail.	21-hours	Most fluctuations within 50 mV. Maximum fluctuation of 85 mV.
2	Data logging voltage gradients between steel earth stakes perpendicular to the rail.	21-hours	Most fluctuations within 125 mV. Maximum fluctuation of 315 mv.
3	Data logging the potential of the street boundary fence	21-hours	All fluctuations within 5 mV.
4	Data logging the potential of a fence parallel to the rail	21-hours	Most fluctuations within 40 mV. Maximum fluctuation of 97 mv.

7. Discussion

The test results show that one of the four locations recorded stray current effects that are within acceptable limits. The remaining three test locations recorded stray current effects that at times exceeded acceptable limits.

1. Data logging voltage gradients between steel earth stakes parallel to the rail shows stray current effects that at times exceed acceptable limits.
2. Data logging voltage gradients between steel earth stakes parallel to the rail shows stray current effects that at times exceed acceptable limits.
3. Data logging the potential of the site boundary fence shows stray current effects that are within acceptable limits.
4. Data logging potential of a fence parallel to the rail shows stray current effects that at times exceed acceptable limits.

Stray current activity is subject to change based on several factors such as soil conditions and maintenance of railway insulation. The charts attached in Appendix A show a sharp change at approximately 4 am on Friday. This change is attributed to heavy rainfall at this time.

8. Drawings & Documents Reviewed

The relevant drawings and documents provided to and reviewed by CCE are detailed below.

8.1 Architectural Drawings by Plus Studio

- Project Title: Lot 03, 04 & 05 Buchan Avenue, Edmonson Park 2174
- Project Number: 20794

Table 1: Architectural Drawings

Document Name	Drawing Number	Revision	Date
General Floor Plan – Basement 03	DA-S5-0097	B	26/02/2026
General Floor Plan – Basement 02	DA-S5-0098	B	26/02/2026
General Floor Plan – Basement 01	DA-S5-0099	B	26/02/2026
General Floor Plan – Ground	DA-S5-1000	B	26/02/2026
Sections – Sheet 01	DA-S5-3000	B	26/02/2026
Sections – Sheet 02	DA-S5-3001	B	26/02/2026

Additionally, the design report by Plus Studio dated 07/10/2025 was reviewed by CCE.

9. Conclusion

The test results show that the present stray current effects at the site exceed acceptable limits. Under the current conditions, there is a corrosion risk to on-ground and in-ground metallic structures. Stray current effects can change with time and may become a higher corrosion risk.

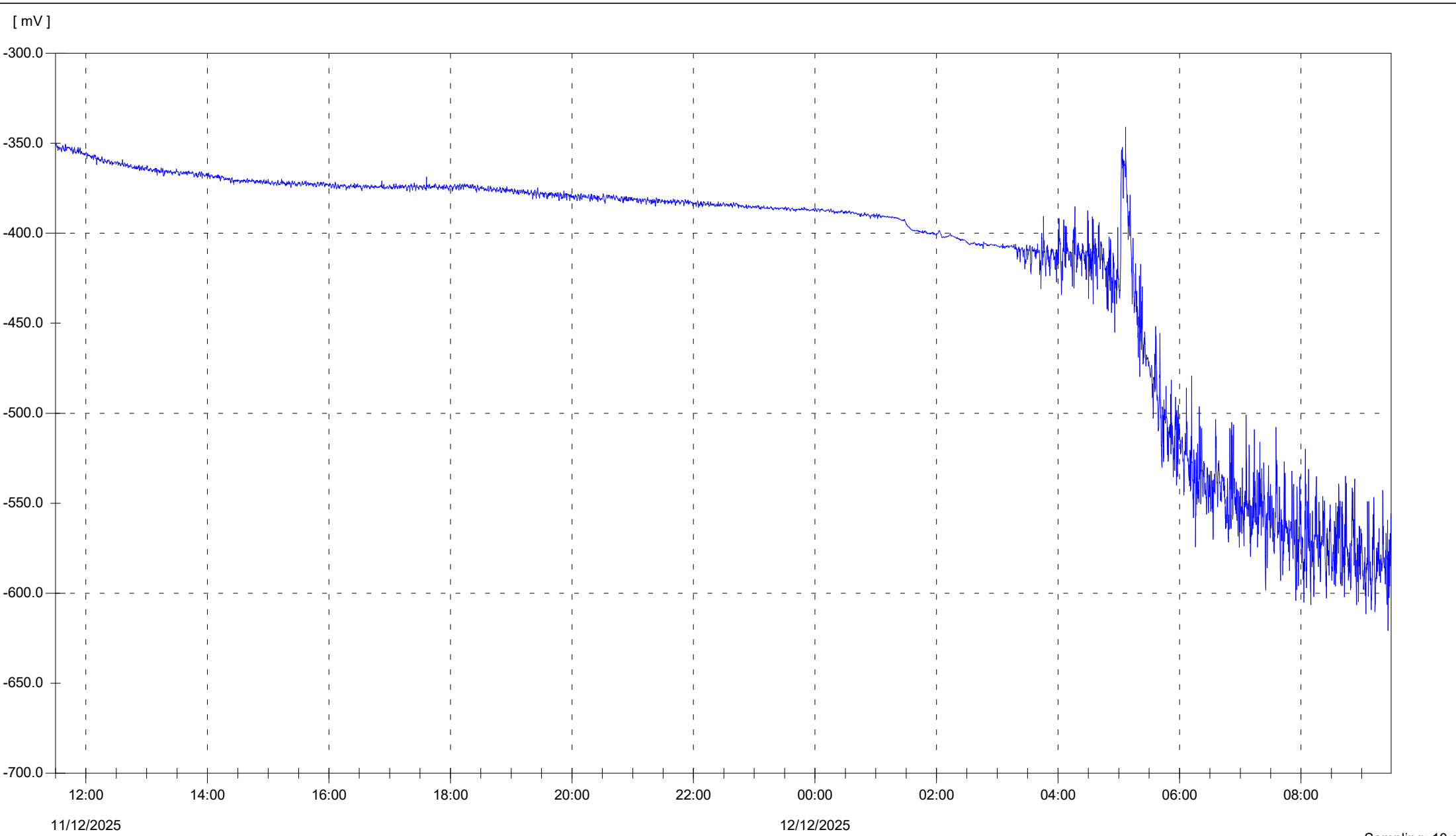
The below recommendations should be adopted to minimise stray current effects as part of any future developments.

10. Recommendations

Based on the site testing and review of the available development drawings/documents, CCE recommend the following conservative protective measures, where possible/practical, to mitigate against long-term stray current corrosion at on-ground and in-ground metallic structures:

1. The installation of heavy plastic membrane (e.g. Fortecon) under (or behind) all reinforced concrete slabs, permanent retaining walls, permanent anchors, piers/piles, and metallic posts/bollards to electrically isolate from soil and stray currents. *Note, this may not always be possible/practical at piers/piles or when friction is relied upon for structural purposes.*
2. Ensure the high strength (minimum 32 MPa), high cover (minimum 50 mm) concrete is used to effectively prevent/limit soil moisture penetrating through to the steel/metal.
3. The use of plastic, rather than metallic, in-ground pipework and tanks. In the event buried metallic pipework and/or cables are installed within the site, installation within sealed non-metallic conduit is recommended. Where this is not possible (for example at metal water main feeds), insulating flanges/fittings/unions at the property boundary/meter can be used to electrically isolate the property piping.

APPENDIX A: DATA LOGGER CHARTS



Sampling: 10 s

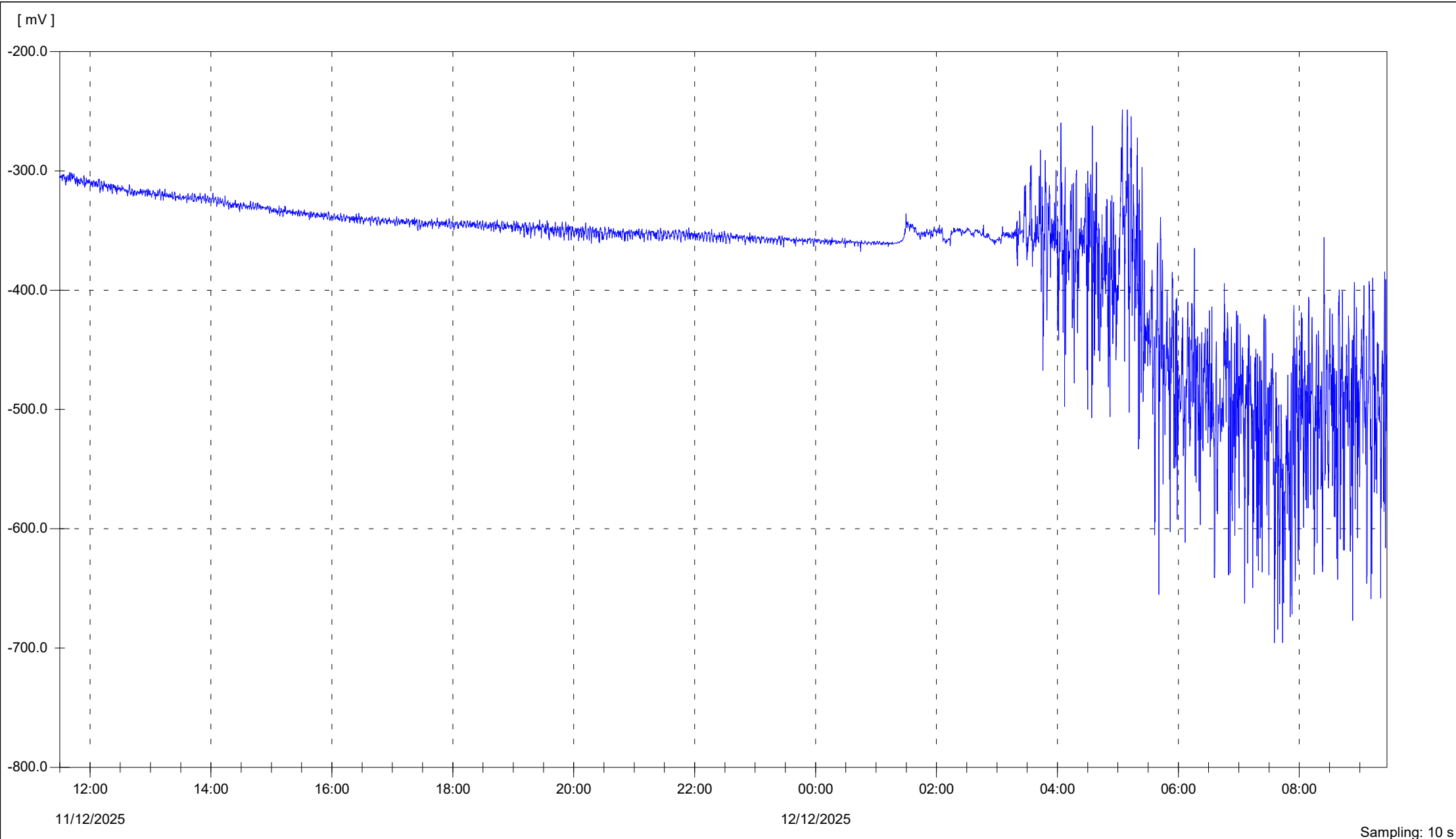
— : Volts vs Cu/CuSO4

MiniLog2

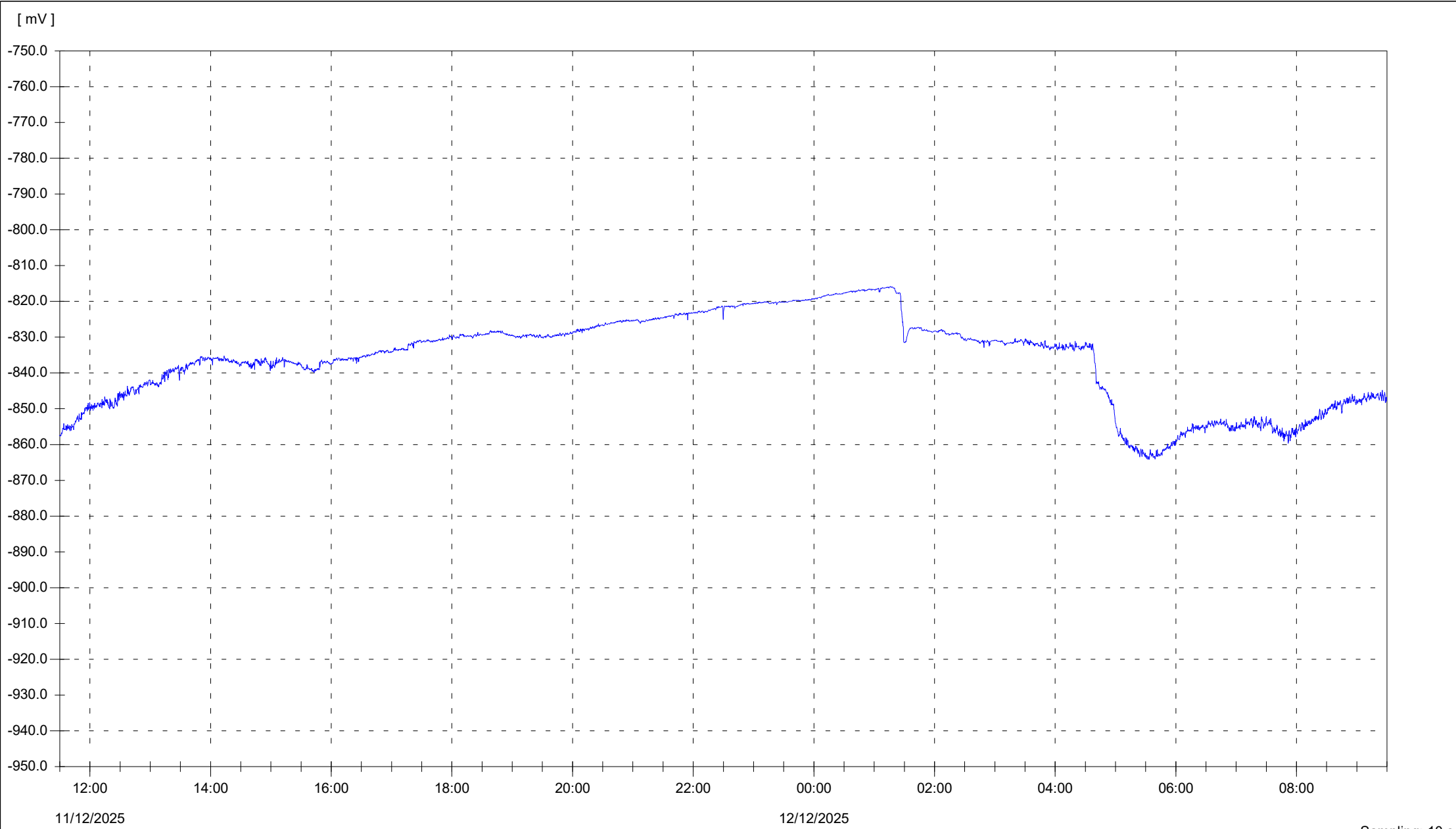
	Min	Max	Average	Std. dev.
DC 1	-0.621 V	-0.341 V	-0.414 V	0.068 V

Electrolysis Risk Testing
Lot 8 Buchan Avenue, Edmonson Park NSW
2174 Data Logger Serial Number: 6213
Parallel to the Rail





— MiniLog2						Electrolysis Risk Testing Lot 8 Buchan Avenue, Edmonson Park NSW 2174 Data Logger Serial Number: 6712 Perpendicular to the Rail		 CORROSION CONTROL ENGINEERING	
— : Volts vs Cu/CuSO4			Min	Max	Average	Std. dev.			
DC 1			-0.696 V	-0.249 V	-0.373 V	0.066 V			



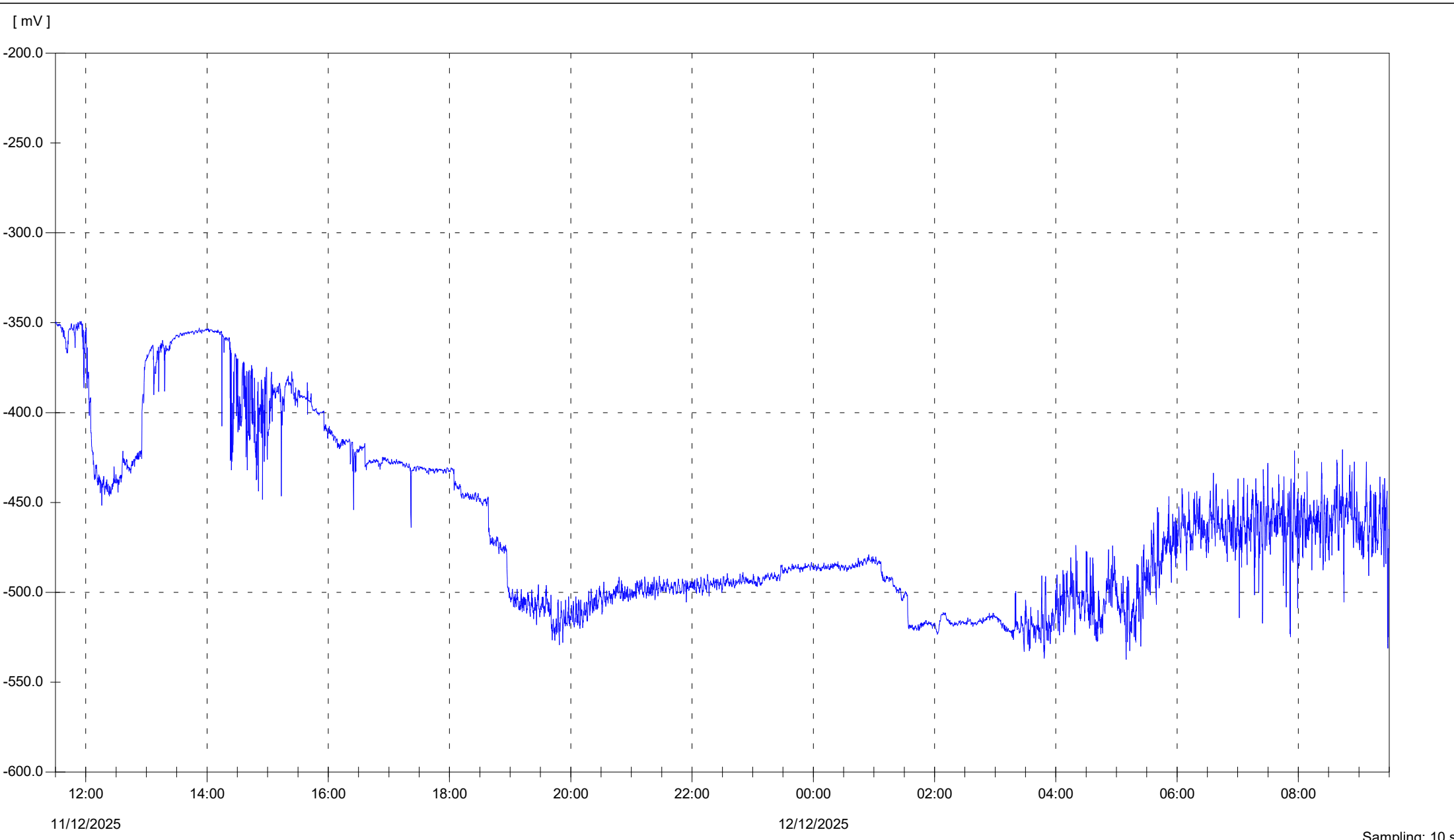
— : Volts vs Cu/CuSO4

MiniLog2

	Min	Max	Average	Std. dev.
DC 1	-0.864 V	-0.816 V	-0.836 V	0.012 V

Electrolysis Risk Testing
Lot 8 Buchan Avenue, Edmonson Park NSW
2174 Data Logger Serial Number: 2749
Street Boundary Fence





— : Volts vs Cu/CuSO4

MiniLog2

	Min	Max	Average	Std. dev.
DC 1	-0.537 V	-0.349 V	-0.463 V	0.049 V

Electrolysis Risk Testing
Lot 8 Buchan Avenue, Edmonson Park NSW
2174 Data Logger Serial Number: 6217
Fence Parallel to the Rail

