



Using GIS to Improve Transpower's Data Quality

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Who is Transpower?

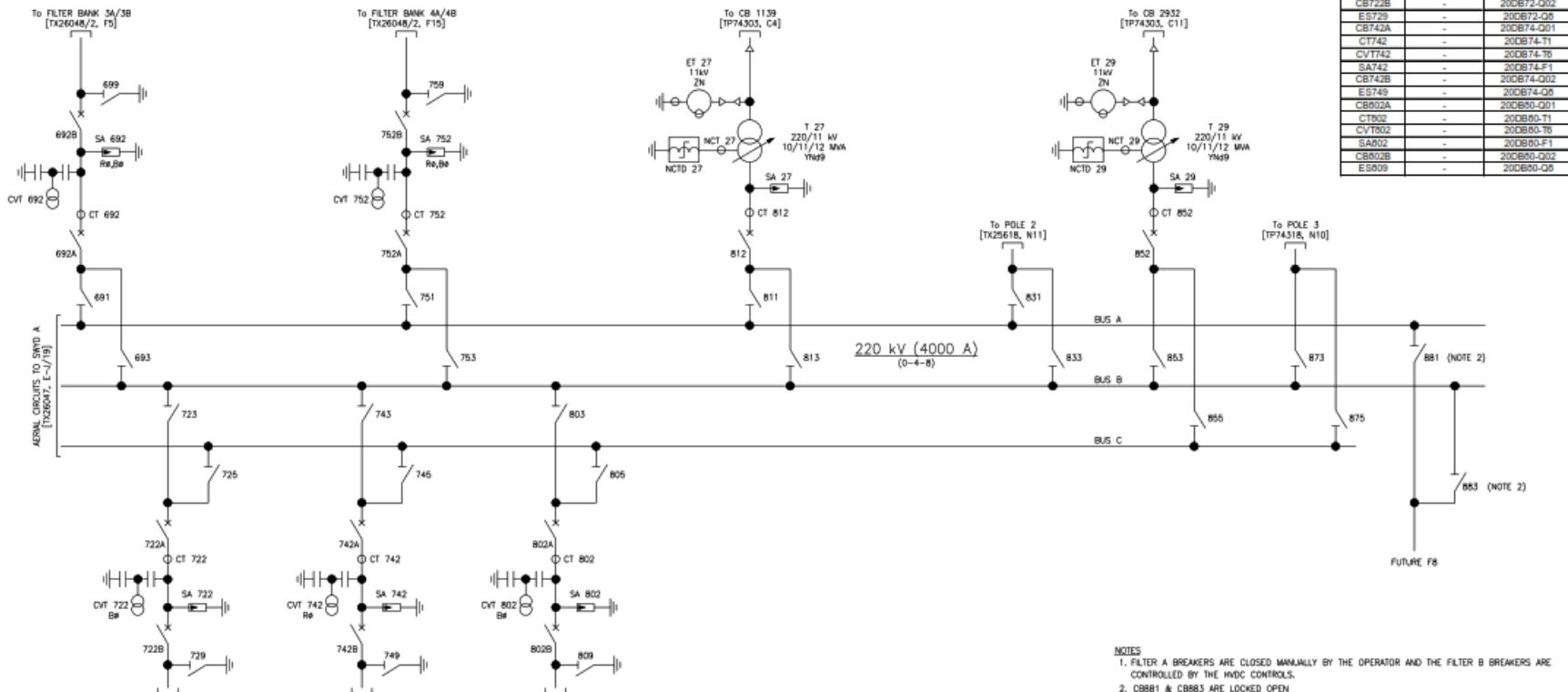
- State owned enterprise
- Owns and operates the national grid
- Over 12,000 km of transmission lines
- 174 substations



The Project

- Started in 2014 primarily to capture safety, facilities and primary switchgear data
- Expanded to include infrastructure, civil and underground data
- Aim to provide a centralised dataset





| | | |
|--------|---|------------|
| CVT722 | - | 20CB72-7b |
| SA722 | - | 20CB72-F1 |
| CB723b | - | 20CB72-Q02 |
| EB729 | - | 20CB72-Q06 |
| CB743A | - | 20CB74-Q01 |
| CT742 | - | 20CB74-T1 |
| CVT742 | - | 20CB74-Tb |
| SA742 | - | 20CB74-LF1 |
| CB742B | - | 20CB74-Q02 |
| EB749 | - | 20CB74-Q06 |
| CB802A | - | 20CB80-Q01 |
| CT802 | - | 20CB80-T1 |
| CVT802 | - | 20CB80-Tb |
| SA802 | - | 20CB80-F1 |
| CB802B | - | 20CB80-Q02 |
| EB809 | - | 20CB80-Q06 |

NOTES

1. FILTER A BREAKERS ARE CLOSED MANUALLY BY THE OPERATOR AND THE FILTER B BREAKERS ARE CONTROLLED BY THE HVDC CONTROLS.
2. CB881 & CB883 ARE LOCKED OPEN.
3. T27 & T29 TRANSFORMER RATINGS **/**/*MVA ARE FOR CONTINUOUS/SUMMER/WINTER RESPECTIVELY.
4. THE FILTER BANK EQUIPMENT IS MADE UP OF THREE IDENTIFICATION SYSTEMS (TRANSFORMER, ABB & SIEMENS). THE TABLE INDICATES THE DUPLICATE IDENTIFICATION WHERE APPLICABLE.

REFERENCE DRAWINGS

- TP74303 (B108/2C1.1) POLE 2 & POLE 3 11kV SINGLE LINE DIAGRAM (OPERATING)
- TP74318 (B108/2C1.1) POLE 3 SINGLE LINE DIAGRAM (OPERATING)
- TX26047 (B108/2C1.1) SWITCHYARD A 220 kV SINGLE LINE DIAGRAM (OPERATING)
- TX26048/2 (B108/2C1.1) SWITCHYARD B 220 kV FILTER BANKS SINGLE LINE DIAGRAM (OPERATING)
- TX26118 (B108/2C1.1) POLE 2 SINGLE LINE DIAGRAM (OPERATING)
- TP54974/1 (B108/2C1.1) RELAY & INSTRUMENTATION DWG LIST & EQUIPMENT LEGENDS (OPERATING)

THIS DRAWING SUPERSEDES T17098 & 70111-02-710-001

| REV | DESCRIPTION | CONSULTANT/ENGINEER | | | | | | IP | | |
|-----|--------------------------------|---------------------|-----|-------|-----|-------|-----|-------|------|-------|
| | | NAME | DSN | DATE | DRN | DATE | CHK | | DATE | APP |
| - | AS BUILT: 1ST ISSUE OF DRAWING | EDSON | | 10/14 | ML | 16/14 | ML | 10/14 | MD | 10/14 |
| A | AS BUILT: TABLE ADDED | EDSON | | 03/17 | ML | 03/17 | ML | 03/17 | MD | 03/17 |

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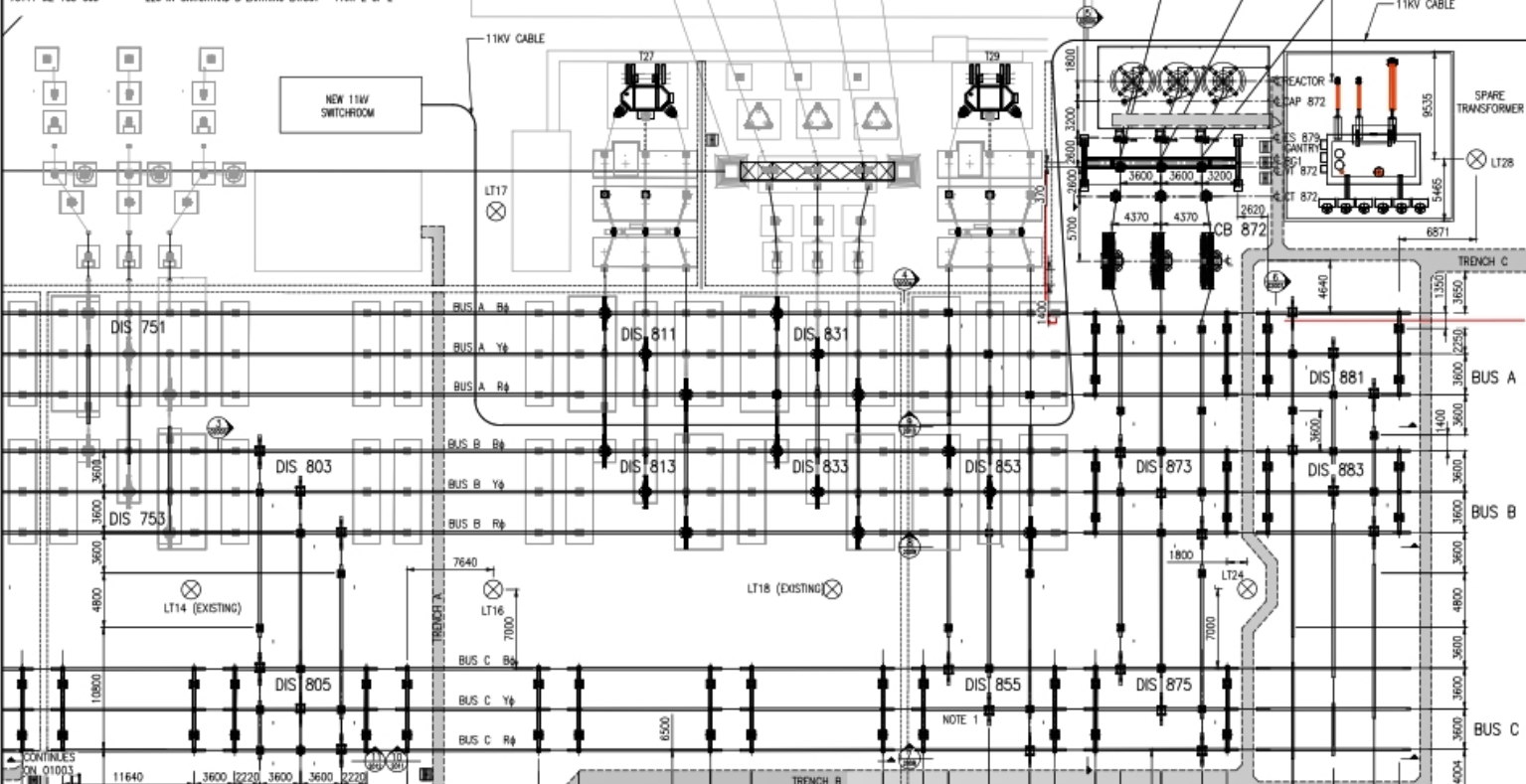
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BENMORE SUBSTATION
SWITCHYARD B 220/144/11 kV
SINGLE LINE DIAGRAM (OPERATING)

| | | |
|-------------------------------------|-----------------|-------------------------|
| DRG. SIZE A1 | SCALE N.T.S. | FOLDER B108/2C1.1 |
| DRAWING NUMBER TX26048 | | SHEET REVISION 1 A |
| SOURCE FILE NAME TX26048_1_0.dwg | | |

REFERENCE DRAWINGS:

- P3_E_C1_0808_BEN_01003 220 kV SWITCHYARD B LAYOUT PART 2
- P3_E_C1_0808_BEN_01004 220 kV SWITCHYARD B LAYOUT PART 3
- P3_E_C1_0808_BEN_01010 220 kV SWITCHYARD B LAYOUT PART 4
- P3_E_C1_0808_BEN_02003 220 kV SWITCHYARD B BAY 7 ELEVATION
- P3_E_C1_0808_BEN_02004 220 kV SWITCHYARD B BAY 3 ELEVATION
- P3_E_C1_0808_BEN_02005 220 kV SWITCHYARD B BAY 2 ELEVATION
- P3_E_C1_0808_BEN_02007 220 kV SWITCHYARD B BAY 1 ELEVATION
- P3_E_C1_0808_BEN_02008 220 kV SWITCHYARD B BUS B BAY B1-B3 ELEVATION
- P3_E_C1_0808_BEN_02009 220 kV SWITCHYARD B BUS B BAY B1-B3 ELEVATION
- P3_E_C1_0808_BEN_02010 220 kV SWITCHYARD B BUS A BAY B1-B3 ELEVATION
- P3_E_C1_0808_BEN_02011 220 kV SWITCHYARD B BUS C BAY B4-B6 ELEVATION
- 50356-W2-613-001 SITE LAYOUT S&Z CONTRACT
- 50356-W2-111-001 220kVAC SWITCHYARD B EARTHWORKS AND DRAINAGE PLAN
- LWS 1188 LAYOUT BENMORE
- B116-02 DC YARD DUCTING LAYOUT
- XN660129-AM-01 STATIONS LAYOUT DRAWING
- XN660129-EDB-01 STATIONS LAYOUT
- XN660129-E3D-01 LAYOUT DRAWING
- 50356-W2-161-001 220 kV AC SWITCHYARD B FOUNDATION LAYOUT - PART 1
- 50356-W2-161-001 220 kV AC SWITCHYARD B FOUNDATION PAD LAYOUT - PART 1
- 50356-W2-161-003 220 kV SWITCHYARD B LAYOUT - PART 1
- 50356-W2-613-001 220 kV SWITCHYARD B LAYOUT - PART 1
- 70111-W2-753-003 220 kV SWITCHYARD B EARTHING LAYOUT - PART 2 OF 2



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| | |
|-------------------------|------------|
| Date: | 28/01/2016 |
| Approved By: | MD |
| Folder Reference: | B108/3A1 |
| Manufacturers Revision: | R2 |
| Project Reference: | P3ICT100 |

P3_E_C1_0808_BEN_01002

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Approval

| Rev | Date | Revision Details | Drawn | Ver | Appr |
|-----|-------|-----------------------------------|-------|-----|------|
| R1 | 11.13 | Approval Block | NLP | RA | UK |
| R | 06.13 | AS BUILT - MINOR CHANGES | AM | SMW | JFS |
| OP | 06.12 | FOR APPROVAL | SMW | SMW | |
| OB | 07.12 | REVISED LIGHTING DESIGN | HF | SMW | |
| OT | 07.11 | REVISED AS CLOUDED | AM | SMW | |
| OB | 07.11 | STAGE 3 BOUNDARY MODIFIED | AM | SMW | |
| R2 | 01.16 | AS BUILT + CABLE TRENCH TYPES 121 | DR | DR | DR |

Client:

SIEMENS

P-007925
E_C1_0808_BEN

Project:

NZ Inter Island HVDC POLE 3 Project

**CONVERTER STATION
BENMORE**

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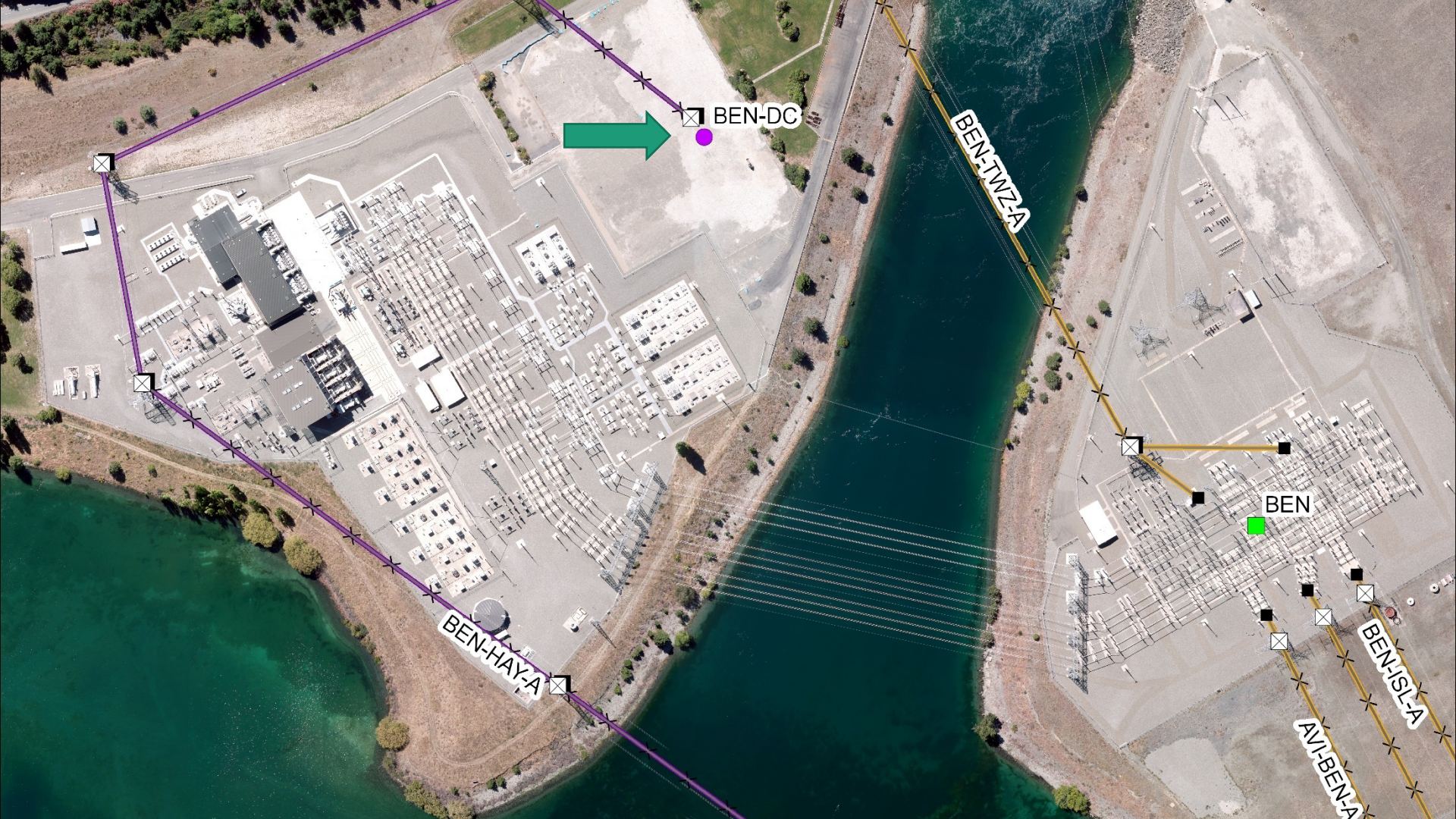
Drawing Title:
**BENMORE POWER STATION
220 kV SWITCHYARD B
LAYOUT**



742A
R0

JB
742.A-2

JB
742.A-



BEN-DC

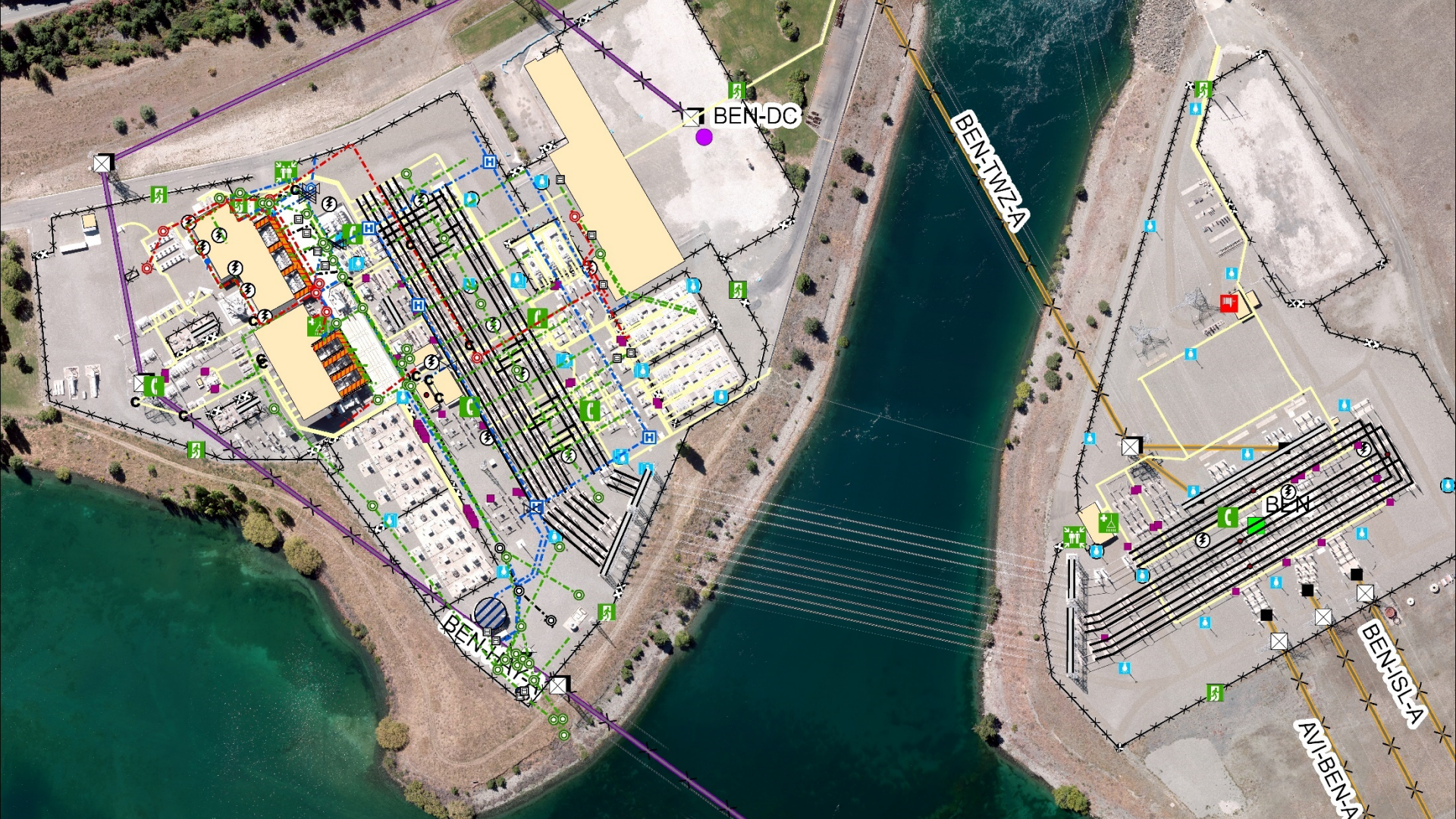
BEN-TWZA

BEN

BEN-HAYA

BEN-ISLA

AVJ-BENA



BEN-DC

BEN-TWZA

BEN

BEN-ISLA

AVI-BENA

BEN



□ BEN-DC

BEN-TWZA

BEN-HAYZA

Challenges and Findings

- Uncovered data process gaps
- Various use cases
- Interest from service providers

Where to next?

- Focus on improving and maintaining data