November 26, 2025

Alberta Transportation and Economic Corridors
2nd Floor, 803 Manning Road N.E.
Calgary, Alberta
T2E 7M8

Alex Frotten, P.Eng.
Construction Engineer – Delivery Services Division (Southern Region)

Dear Mr. Frotten:

CON0022161 Southern Region GRMP Instrumentation Monitoring
Site S031-II; Hwy 762:02, km 17.660; Mystery Culvert
Section C – 2025 Fall Readings

1 GENERAL

One slope inclinometer and two vibrating wire piezometers (VWPs) (BH25-01) were read at the S031-II site in the Southern Region on October 7, 2025 by Mr. Shawn Keegan, E.I.T. of Klohn Crippen Berger Ltd. (KCB). This instrument was read as part of the Southern Region Geohazard Risk Management Program (GRMP). The S031-II site is a sub-site near the original S031-I - Mystery Culvert site. S031-I was removed from the GRMP program in 2021 after no movement had been noted since remedial repairs were completed in fall 2017. S031-II is located approximately 8 km south of Bragg Creek, Alberta on Highway 762:02 at km 17.660 (Figure 2). Highway 762:02 is a two-laned paved highway, oriented north-south and is located within CMA 27. The approximate UTM coordinates of the site are 5639613 N, 672917 E (UTM Zone 11U, NAD 83) and the legal land description is 07-19-22-04 W5M.

S031-II has been included in the annual GRMP tour of the Southern Region since 2008 (AMEC, 2012b). In 2017 a toe berm was constructed at the base of the slope to attempt to prevent further movement. In 2019 new tension cracking was noted during the annual tour of the GRMP southern region. By mid-2020 the pavement had settled 200 mm and was patched in June 2020. Mid-slope tension cracking was also noted at this time. In 2021 the slope failure was approximately 40 m wide, extending up to 2 m into the highway. Pavement cracking was observed on the west shoulder. This has been monitored annually, and as of spring 2024 there has been no discernible change. The embankment is approximately 4 m to 5 m high.

1.1 Instrumentation

In February 2025, KCB completed a site investigation at S031-II. The site investigation consisted of 1 borehole. The investigation indicated a stratigraphy of 5 m of sandy gravel fill, overlaying

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approximately 10 m of clay till, and weak, poorly indurated siltstone bedrock below 15 m. One SI and two nested VWP's were installed after drilling was completed. Instrument locations are shown in Figure 1. Instrument installation details are included below in Table 1.1.

The SIs is read using a metric RST Digital MEMS Inclinometer System. The VWPs are read using an RST VWP readout box.

Table 1.1 Instrument Installation Details

Instrument ID	Instrument Type	Installation Date	UTM Coordinates[1] (m)		Ground Surface Elevation (m)	Depth (mbgs[2])	Condition
			Northing	Easting			
SI25-01	SI	Feb 12, 2025	5639610	672914	1366	19.8	Operable
VWP25-01	VWP	Feb 12, 2025				5.50	Operable
VWP25-02	VWP	Feb 12, 2025				15.56	Operable

Notes:
[1] Ground surface elevations were obtained with a handheld eTrex GPS during instrumentation reading and are accurate to ± 5 m.
[2] Meters below ground surface (mbgs) tip depth for VWPs, bottom of inclinometer casing for SIs.

2 INTERPRETATION

2.1 General

The SI plots presented in the report include cumulative displacement, incremental displacement, and displacement-time data (Appendix I). The displacement-time data is plotted in the A-direction (i.e., the direction of the A0-groove).

For the VWPs, the recorded porewater pressures were converted to an equivalent water/piezometric elevation and plotted relative to ground surface elevation of each instrument's tip elevation.

Monthly precipitation data is also plotted with the piezometer data. The data was obtained from the Alberta Climate Information Service (ACIS) database, referencing the Elbow Ranger Station.

The SI and piezometer data plots are included in Appendix I.

2.2 Zones of Movement

SI25-01 was initialized during the spring 2025 readings and has only been read once since then in the fall 2025 readings. No discernible zones of movement have been identified.

2.3 Interpretation of Monitoring Results

VWP readings indicate that the groundwater elevation has stayed stable since installation in February 2025. The upper VWP (VW199256) readings have ranged from 2.2 to 2.6 mbgs, and the lower VWP (VW194378) readings have ranged from 6.9 to 7.2 mbgs. The different piezometric elevations suggest the possible presence of two perched water tables, likely associated with the more permeable sandy gravel fill at the surface. Still, a correlation between changes in the water table and precipitation events is not conclusive at this point, since readings could reflect a high water table from a high precipitation period.

2.4 Summary

A summary of the SI and piezometer data is provided in Table 2.1 and Table 2.2, respectively.

Table 2.1 Slope Inclinometer Reading Summary

Instrument ID	Date				Ground Surface Elevation (m)	Depth of Movement (mbgs[1])	Direction of Movement, Skew Angle	Cumulative Movement (mm)			Rate of Movement (mm/year)		
	Initialized	Previous Maximum Cumulative Movement Recorded	Previous Reading	Most Recent Reading				Previous Maximum Cumulative	Incremental Since Previous Reading	Total	Previous Maximum	Most Recent Reading	Change from Previous Reading
SI25-01	May 30, 2025	N/A	May 30, 2025	October 7, 2025	1366	N/A	A-Direction	N/A[2]					

Notes:
[1] Meters below ground surface (mbgs).
[2] No discernible movement has been recorded since initialization.

Table 2.2 Vibrating Wire Piezometer Reading Summary

Instrument ID	Serial No.	Date			Ground Surface Elevation (m)	Tip Depth (mbgs[1])	Water Level		
		Installed	Previous Reading	Most Recent Reading			Previous Reading (mbgs[1])	Most Recent Reading (mbgs[1])	Change from Previous Reading (m)
VW25-01	VW199256	Feb 12, 2025	May 30, 2025	October 7, 2025	1366	5.50	2.60	2.61	0.01
VW25-02	VW194378	Feb 12, 2025	May 30, 2025	October 7, 2025	1366	15.56	7.24	6.97	0.27

Notes:
[1] Meters below ground surface (mbgs).

3 RECOMMENDATIONS

3.1 Future Work

All operable instruments should continue to be read twice per year (spring and fall). Spring readings should be completed after mid-May to avoid the risk of water inside the instrument casings freezing earlier in the year. Traffic accommodation shutdown is required to access the instrumentation.

The site should continue to be inspected by the Maintenance Contract Inspector (MCI) and as part of the Southern Region GRMP Section B inspections.

3.2 Instrument Repairs and Maintenance

No instrument repairs or maintenance is required.

4 CLOSING

This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Alberta Transportation and Economic Corridors (Client) for the specific application to the Southern Region Geohazard Risk Management Program (Contract No. CON0022161), and it may not be relied upon by any other party without KCB's written consent.

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Please contact the undersigned if you have any questions or comments regarding this report.

Yours truly,

KLOHN CRIPPEN BERGER LTD.

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Geotechnical Engineer

JR:bb

ATTACHMENTS
Figure
Appendix I Instrumentation Plots

FIGURE

Legend

- Borehole
- Scarp
- Tension Crack
- Fence
- Culvert

0 50 Metres

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 11N
3. IMAGE SOURCE: MAXAR 2024

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
S031-2 - Mystery Culvert
Hwy 762.02, km 17.660

SCALE	PROJECT No.	FIG No.
1:1,500	A05116A03	1

File: Z:\AICGY\Alberta\A05116A03 ABT Southern Region GRMP\400 Drawings\2025\02_Pro_File\Section C\South Region Section C 2025.aprx Date:11/26/2025 10:57 AM Creator: HManandyan

APPENDIX I

Instrumentation Plots

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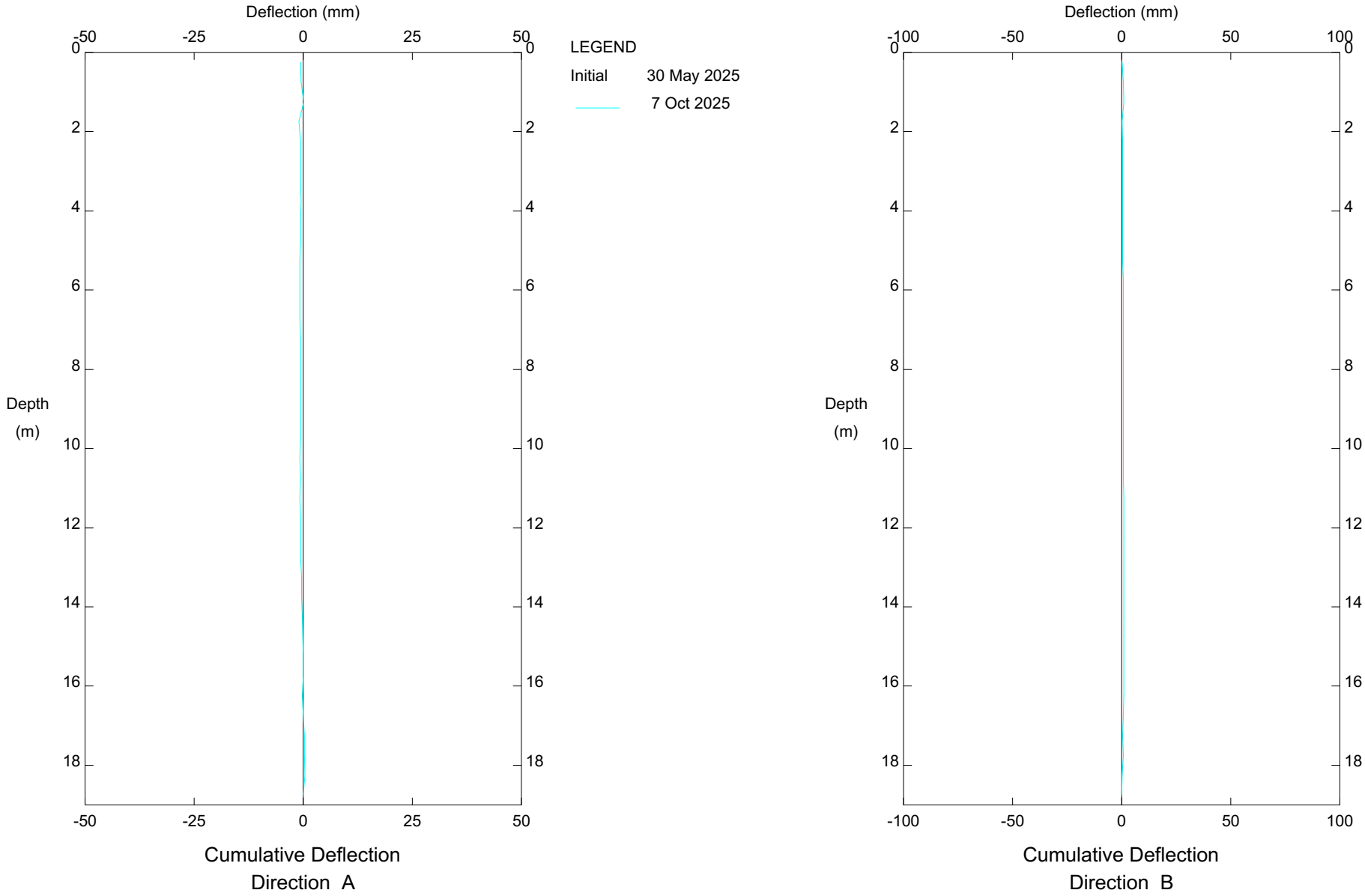

S031-II, Inclinometer BH25-01

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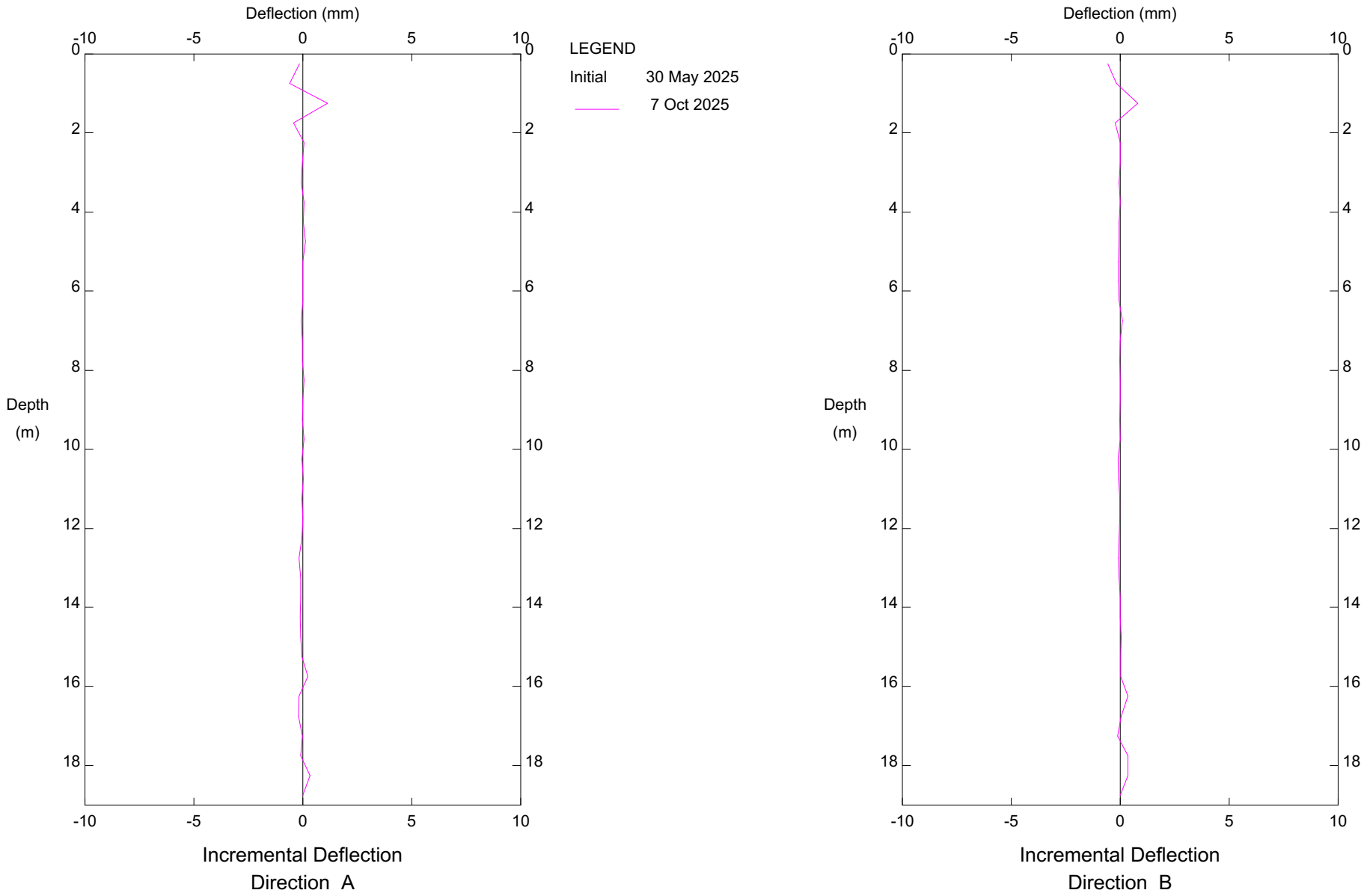

S031-II, Inclinometer BH25-01

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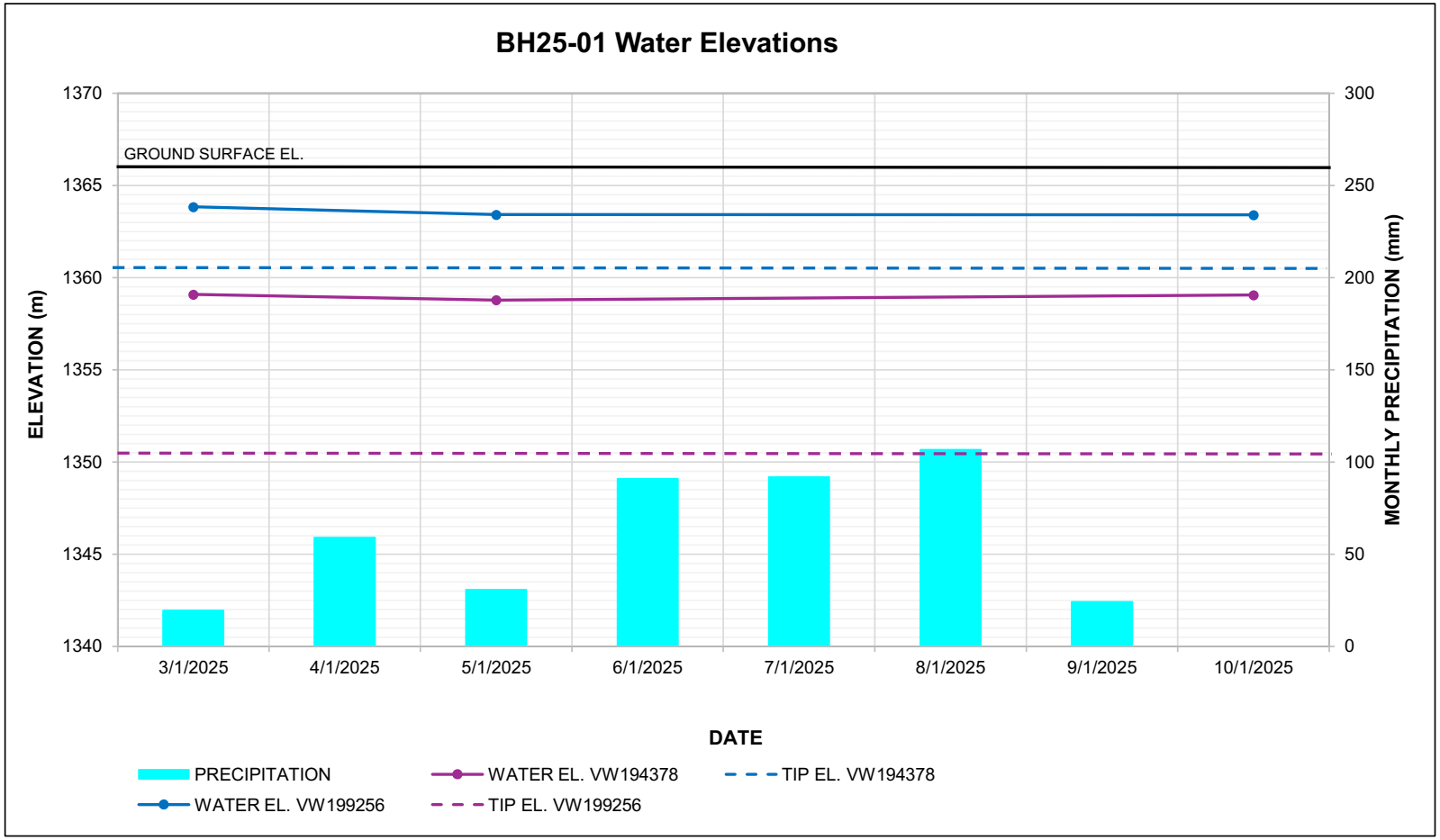

NOTES:
1. MONTHLY PRECIPITATION DATA OBTAINED FROM THE ALBERTA CLIMATE INFORMATION SERVICE (ACIS) DATABASE, REFERENCING ELBOW RANGER STATION.

CLIENT
Alberta
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PROJECT
SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE
Vibrating Wire Piezometer Data
S031-II - Mystery Culvert
Hwy 762:02, km 17.66

SCALE	PROJECT No.	FIG No.
	01A05116A03	