

**Manitoba Clean Environment Commission**  
**Hearing for the Vivian Silica Sand Extraction Project (Project)**  
**Sio Silica Corporation (SSC) Responses to Information Requests (IRs) Round No. 2**  
**Appendix A**  
Sonar Survey Results  
CEC – IR – 014(1)



CUSTOMER	Canwhite Sands
DATE	8/28/21
CAVERN	BRU 92-8
OPERATION #	2 (4200 tonnes)
REPORT #	21-3207



CUSTOMER : Canwhite Sands  
DATE : 8/28/21

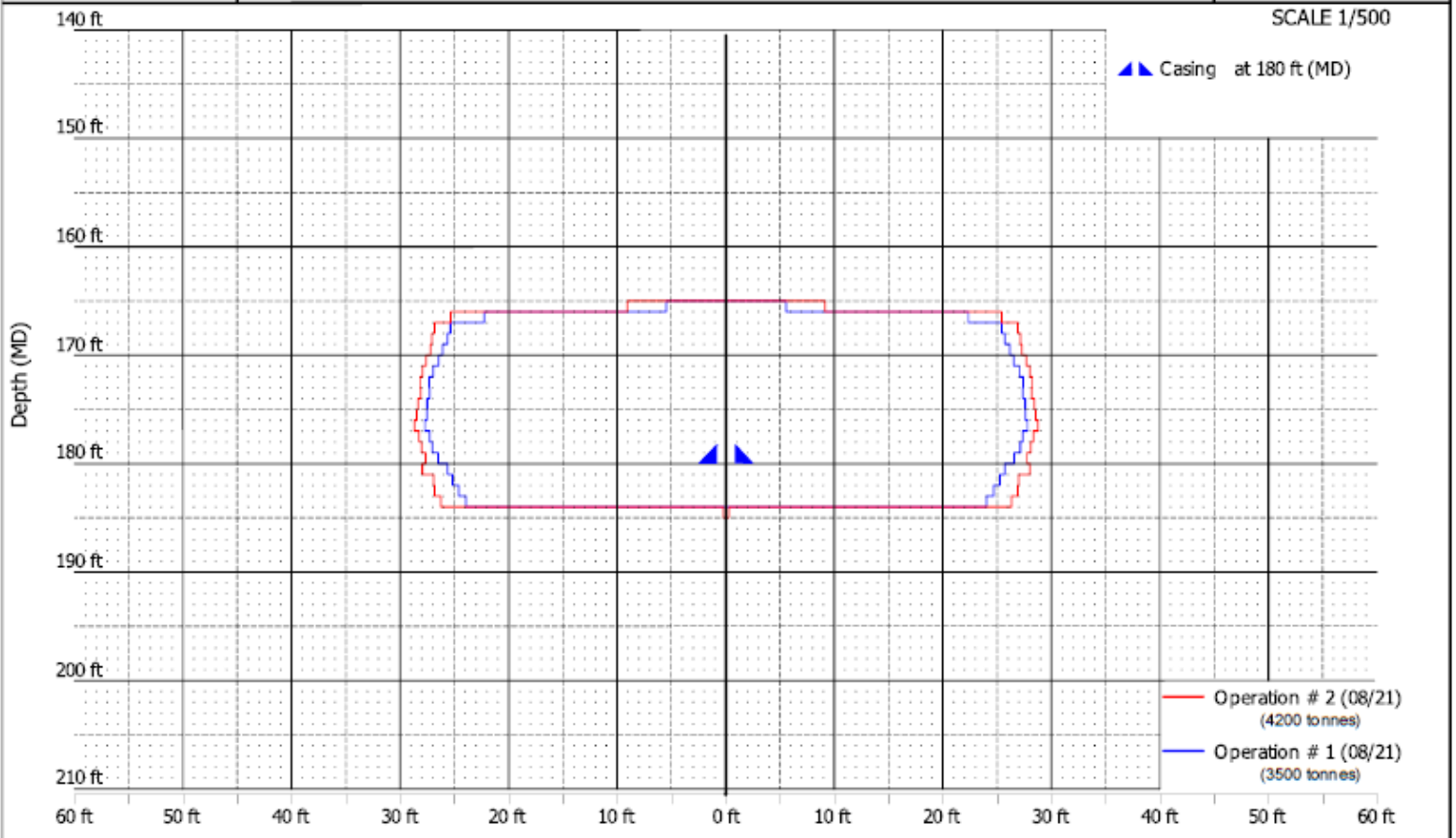
CAVERN : BRU 92-8  
OPERATION # : 2 (4200 tonnes)



### MEAN RADIUS



SCALE 1/500





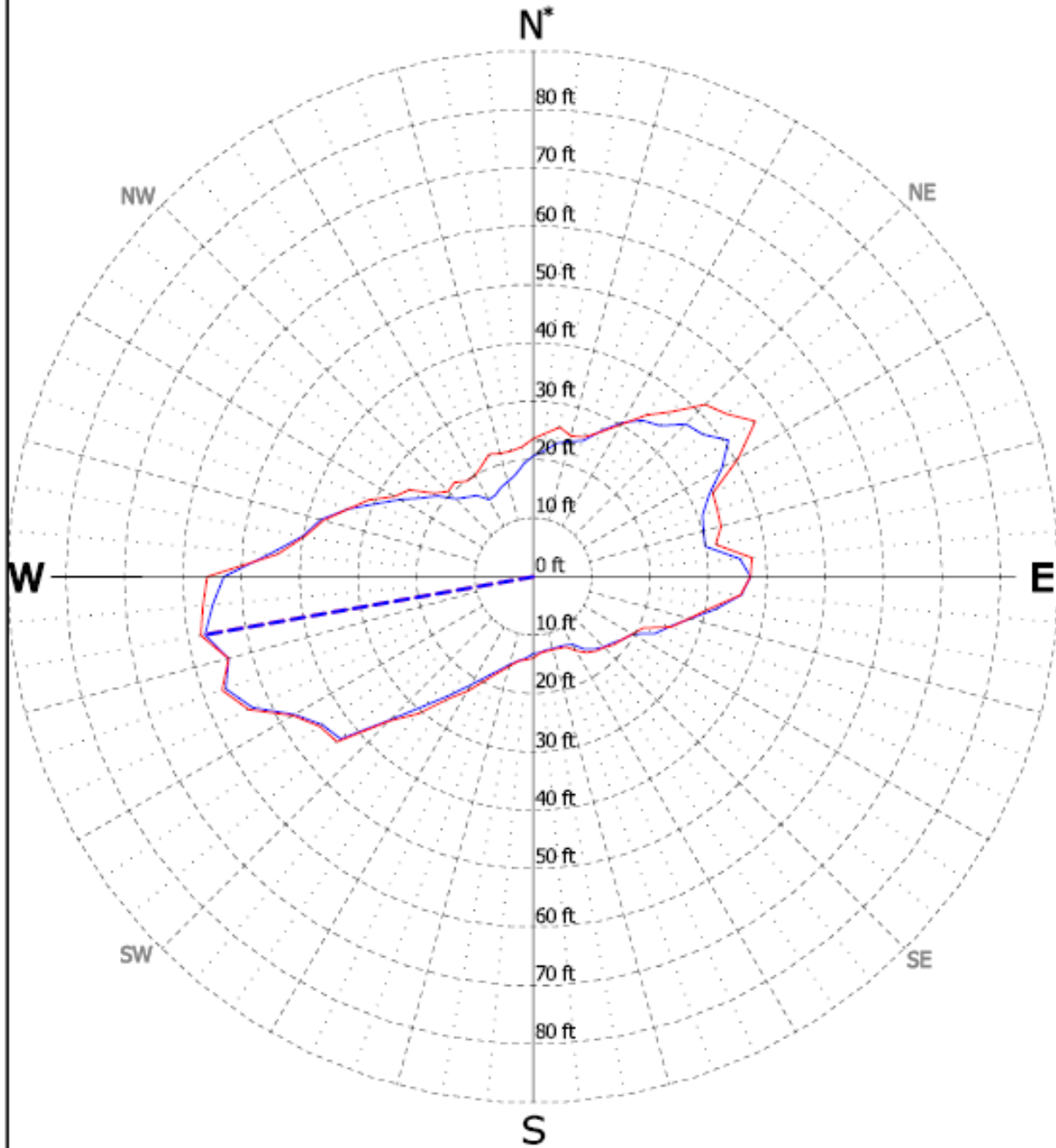
CUSTOMER : Canwhite Sands  
DATE : 8/28/21

CAVERN : BRU 92-8  
OPERATION # : 2 (4200 tonnes)



### MAXIMUM EXTENSION

SCALE 1/1000



- Operation # 2 (08/21)  
(4200 tonnes)
- Operation # 1 (08/21)  
(3500 tonnes)

Maximum radius	: 57.81 ft
Orientation maxi. radius*	: N260
Depth maxi. radius (MD)	: 179.99 ft
Surface	: 3099,70 ft <sup>2</sup>
Max distance between points	: 102,23 ft

\*All sections are oriented to Magnetic North,

Magnetic Declination= 13,5°



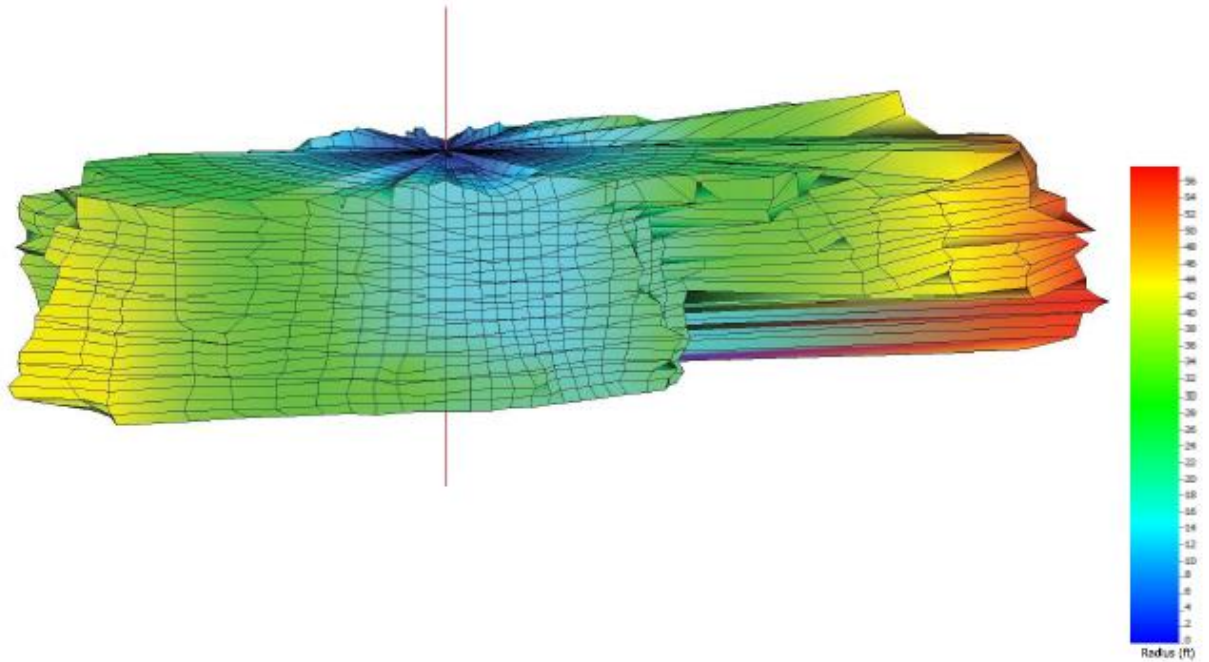
CUSTOMER : Canwhite Sands  
DATE : 8/28/21

CAVERN : BRU 92-8  
OPERATION # : 2 (4200 tonnes)



**VIEW FROM NORTH**  
with an overhang of 10°

SCALE 1/500





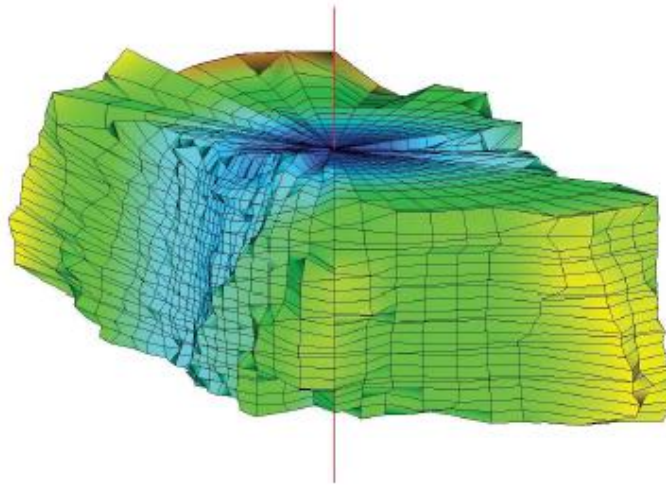
CUSTOMER : Canwhite Sands  
DATE : 8/28/21

CAVERN : BRU 92-8  
OPERATION # : 2 (4200 tonnes)



**VIEW FROM EAST**  
with an overhang of 10°

SCALE 1/500





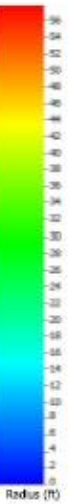
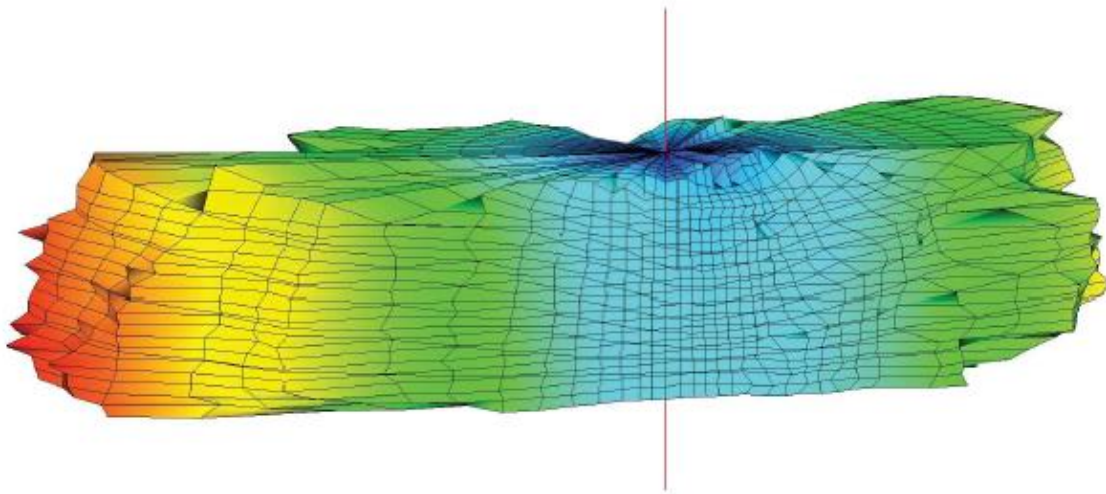
CUSTOMER : Canwhite Sands  
DATE : 8/28/21

CAVERN : BRU 92-8  
OPERATION # : 2 (4200 tonnes)



**VIEW FROM SOUTH**  
with an overhang of 10°

SCALE 1/500



Radius (ft)



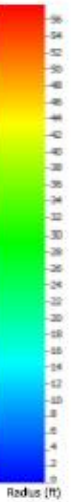
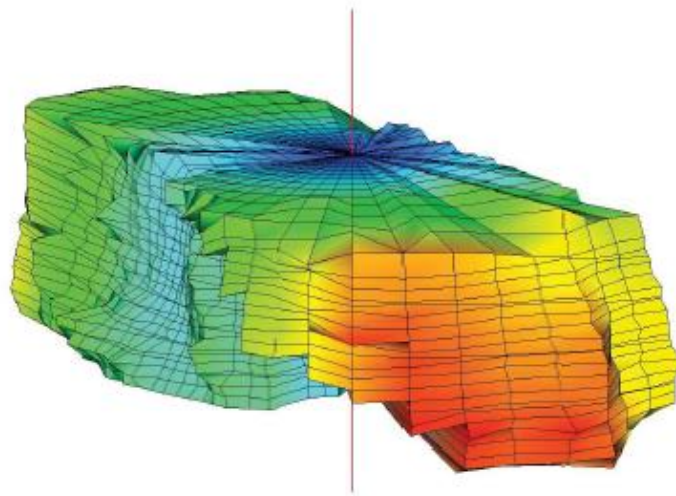
CUSTOMER : Canwhite Sands  
DATE : 8/28/21

CAVERN : BRU 92-8  
OPERATION # : 2 (4200 tonnes)



**VIEW FROM WEST**  
with an overhang of 10°

SCALE 1/500



Radius (ft)



CUSTOMER	Canwhite Sands
DATE	12/09/2021
CAVERN	BRU 92-8
OPERATION #	3 - 4200 tonnes
REPORT #	21-3216



CUSTOMER : Canwhite Sands  
DATE : 12/09/2021

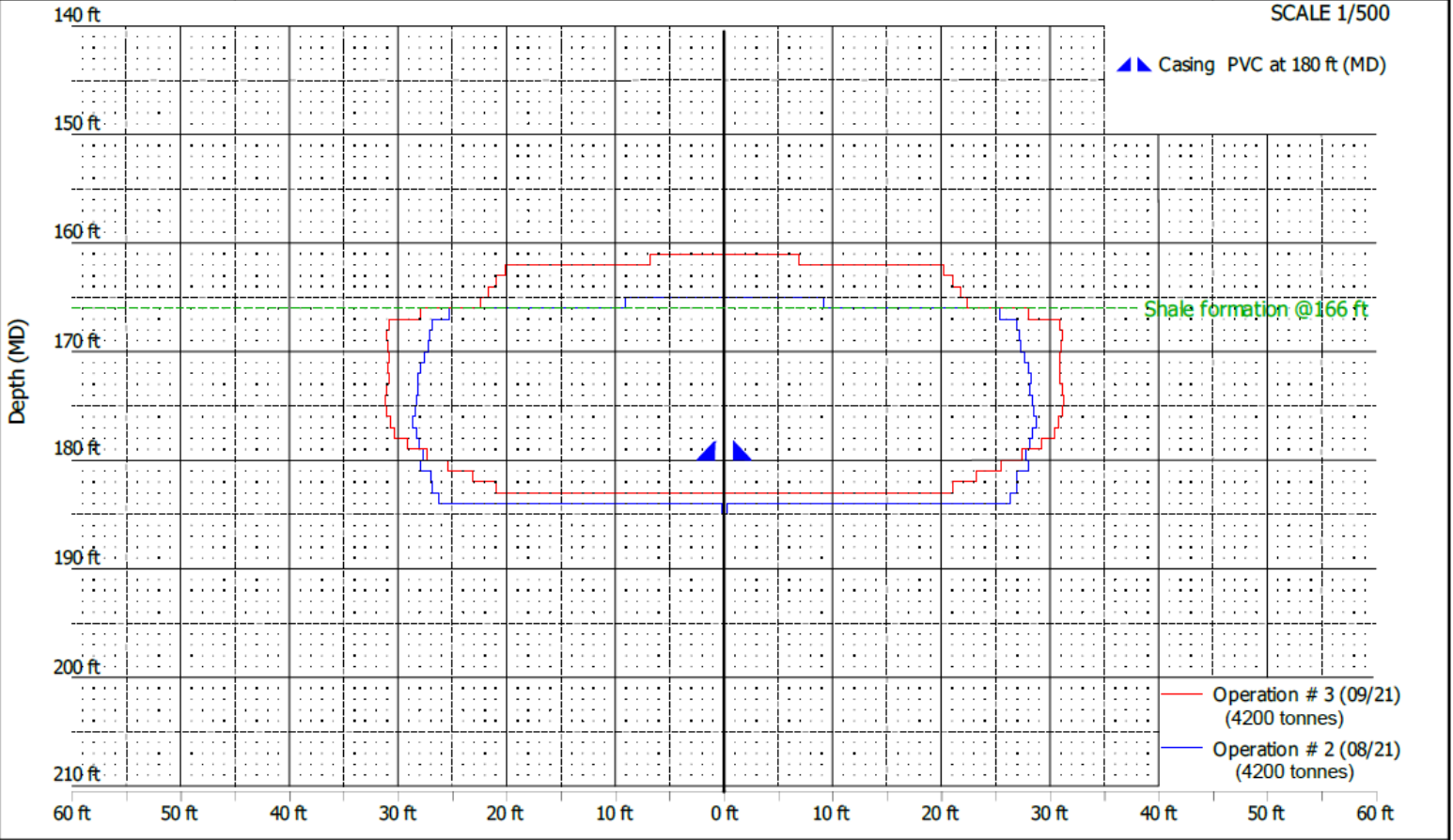
CAVERN : BRU 92-8  
OPERATION # : 3 - 4200 tonnes



### MEAN RADIUS



SCALE 1/500





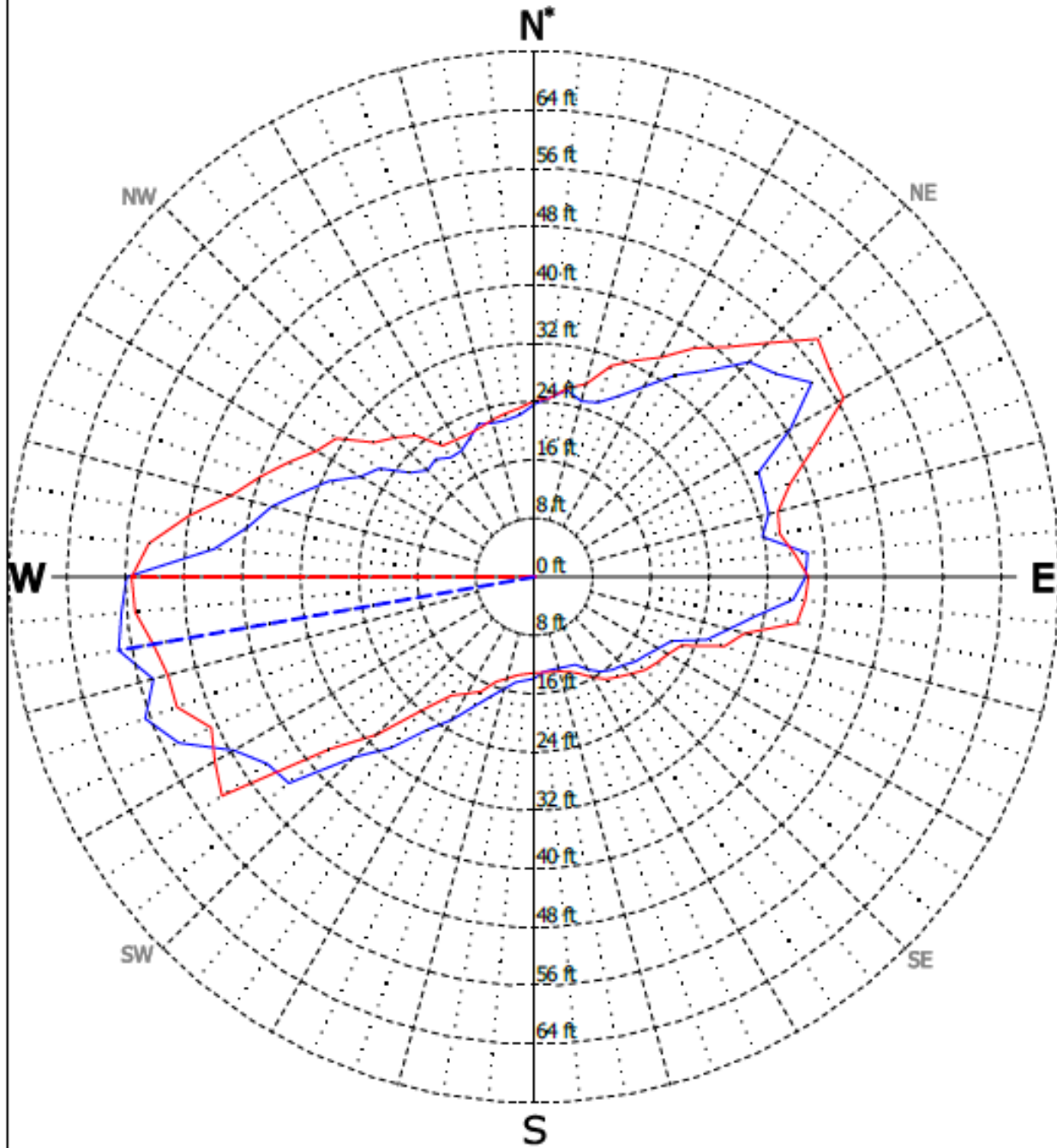
CUSTOMER : Canwhite Sands  
DATE : 12/09/2021

CAVERN : BRU 92-8  
OPERATION # : 3 - 4200 tonnes



### MAXIMUM EXTENSION

SCALE 1/800



- Operation # 3 (09/21)  
(4200 tonnes)
- Operation # 2 (08/21)  
(4200 tonnes)

Maximum radius	: 55.17 ft
Orientation maxi. radius*	: N270
Depth maxi. radius (MD)	: 176.97 ft
Surface	: 3451.52 ft <sup>2</sup>
Max distance between points	: 102.80 ft

\*All sections are oriented to Magnetic North.

Magnetic Declination= 13.5°



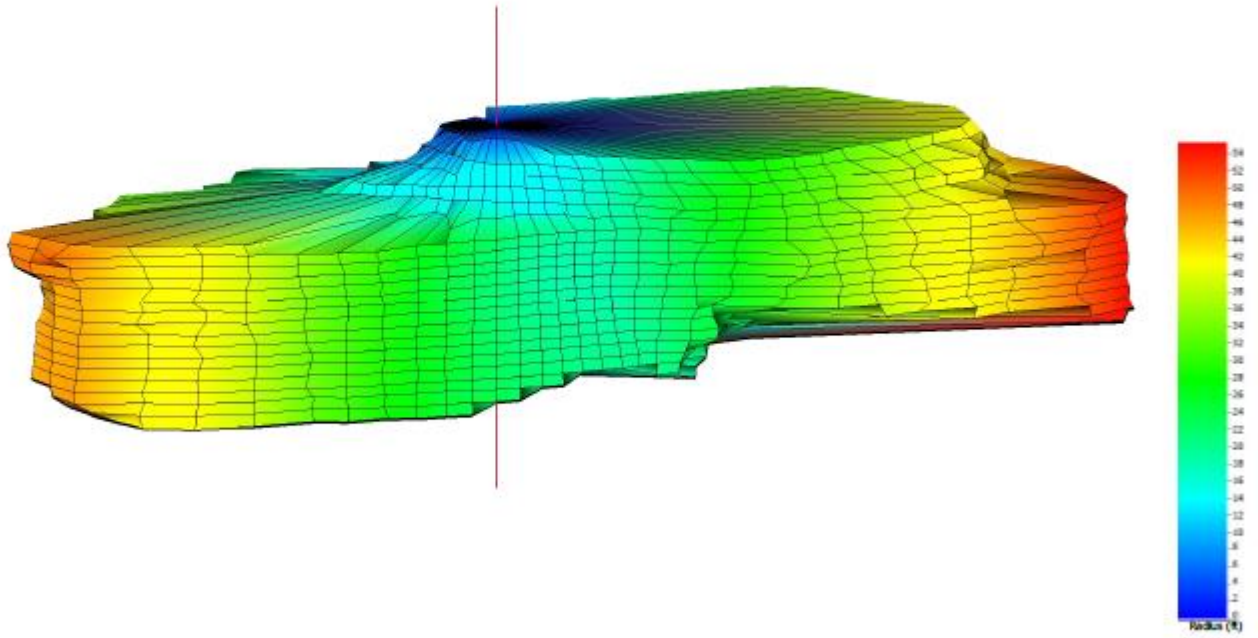
CUSTOMER : Canwhite Sands  
DATE : 12/09/2021

CAVERN : BRU 92-8  
OPERATION # : 3 - 4200 tonnes



**VIEW FROM NORTH**  
with an overhang of 10°

SCALE 1/500





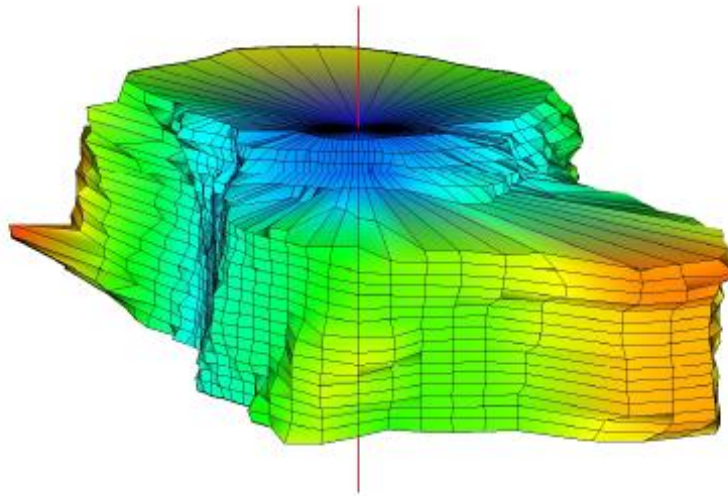
CUSTOMER : Canwhite Sands  
DATE : 12/09/2021

CAVERN : BRU 92-8  
OPERATION # : 3 - 4200 tonnes



**VIEW FROM EAST**  
with an overhang of 10°

SCALE 1/500





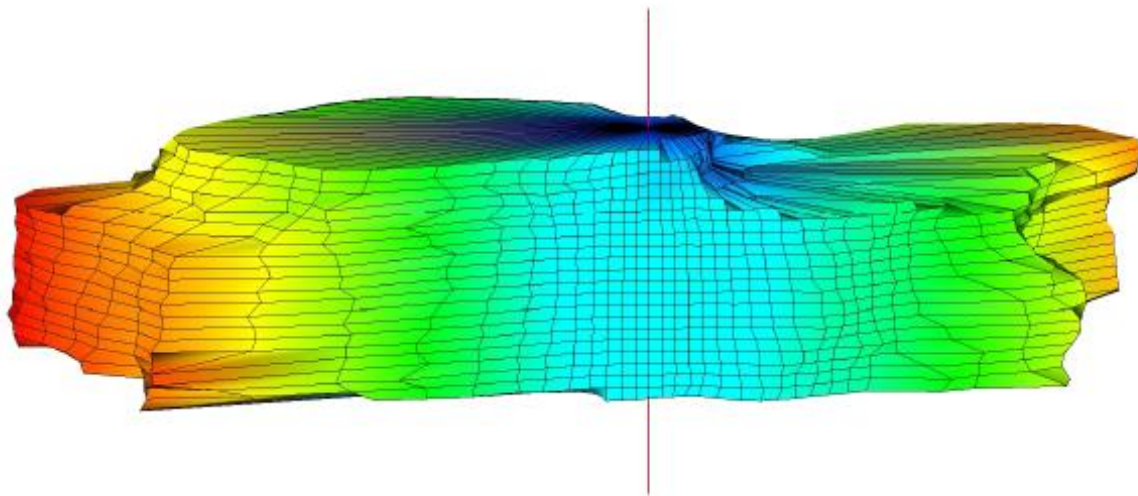
CUSTOMER : Canwhite Sands  
DATE : 12/09/2021

CAVERN : BRU 92-8  
OPERATION # : 3 - 4200 tonnes



**VIEW FROM SOUTH**  
with an overhang of 10°

SCALE 1/500





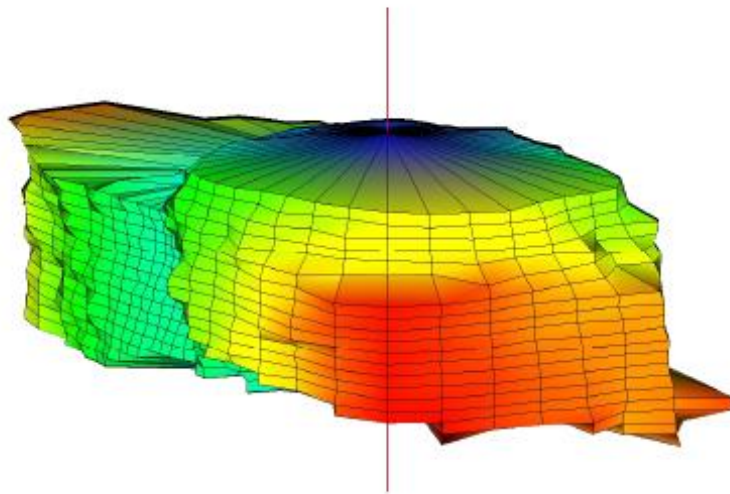
CUSTOMER : Canwhite Sands  
DATE : 12/09/2021

CAVERN : BRU 92-8  
OPERATION # : 3 - 4200 tonnes



**VIEW FROM WEST**  
with an overhang of 10°

SCALE 1/500





CUSTOMER	CANWHITE SAND
DATE	17/12/2021
CAVERN	BRU 92-8
OPERATION #	4 - 4200 tonnes
REPORT #	21-3309



CUSTOMER : CANWHITE SAND  
DATE : 17/12/2021

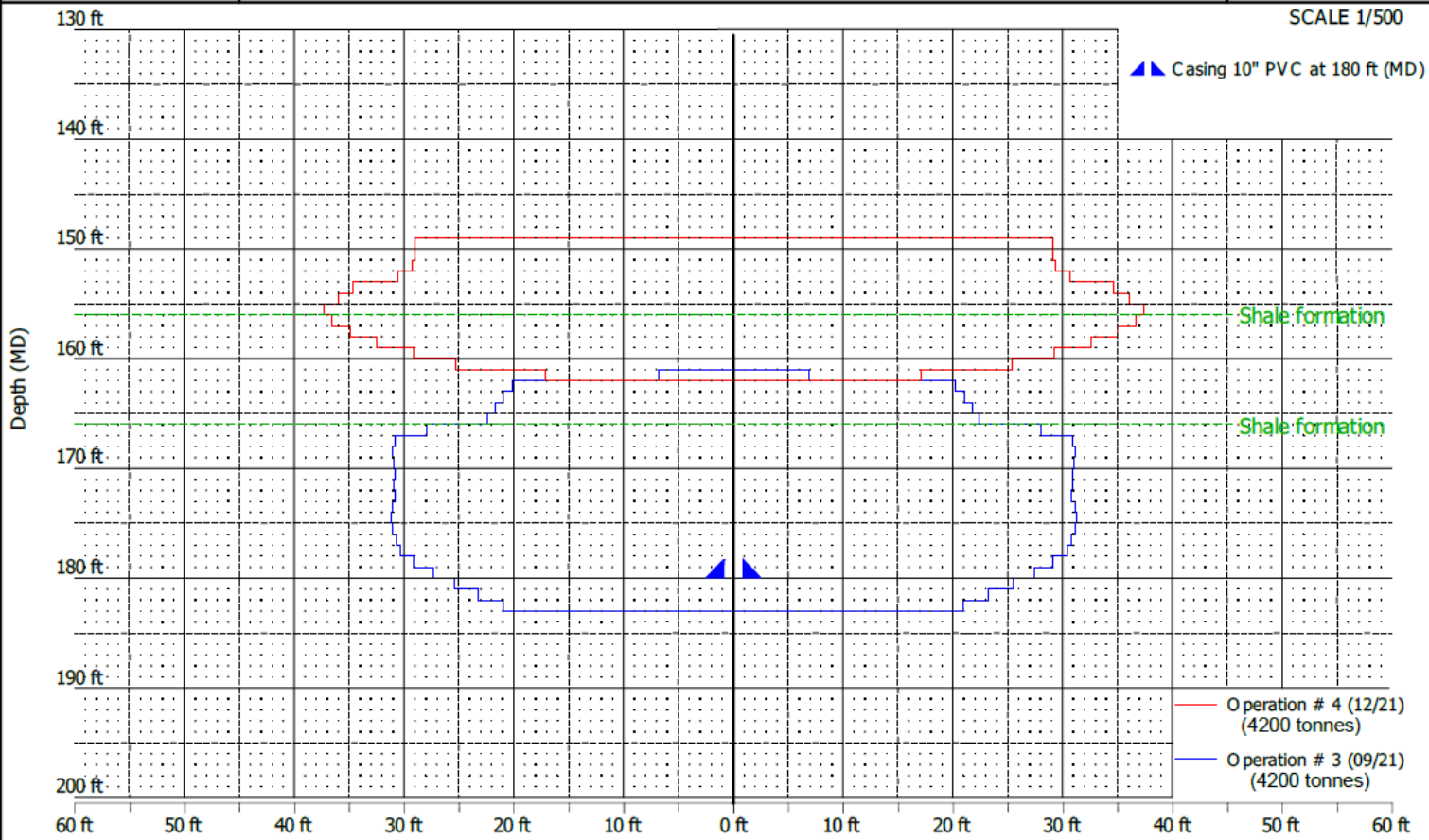
CAVERN : BRU 92-8  
OPERATION # : 4 - 4200 tonnes



### MEAN RADIUS



SCALE 1/500





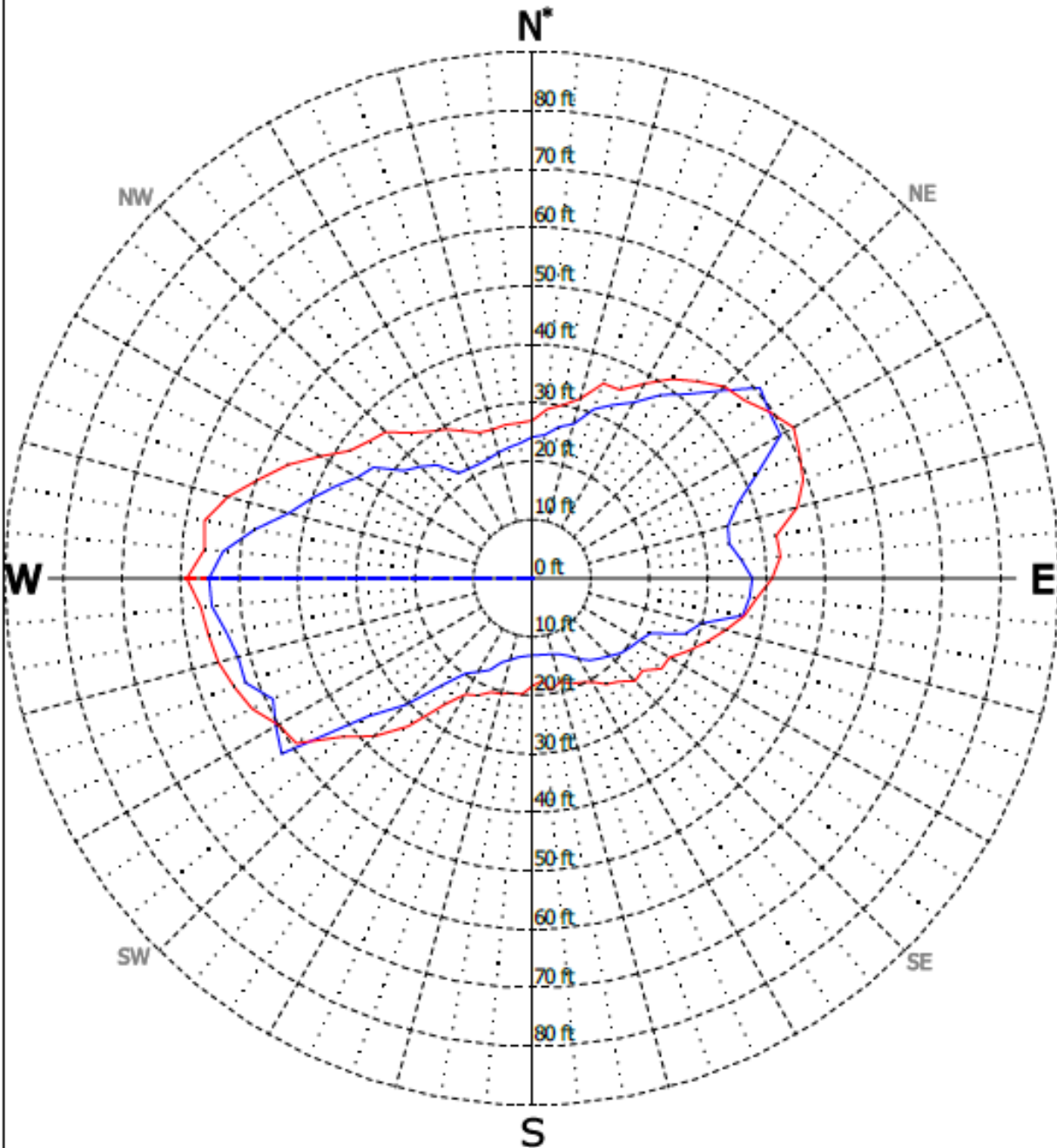
CUSTOMER : CANWHITE SAND  
DATE : 17/12/2021

CAVERN : BRU 92-8  
OPERATION # : 4 - 4200 tonnes



### MAXIMUM EXTENSION

SCALE 1/1000



- Operation # 4 (12/21)  
(4200 tonnes)
- Operation # 3 (09/21)  
(4200 tonnes)

Maximum radius	: 58.95 ft
Orientation maxi. radius*	: N270
Depth maxi. radius (MD)	: 156 ft
Surface	: 4449.20 ft <sup>2</sup>
Max distance between points	: 106.69 ft

\*All sections are oriented to Magnetic North.

Magnetic Declination = 13.5°



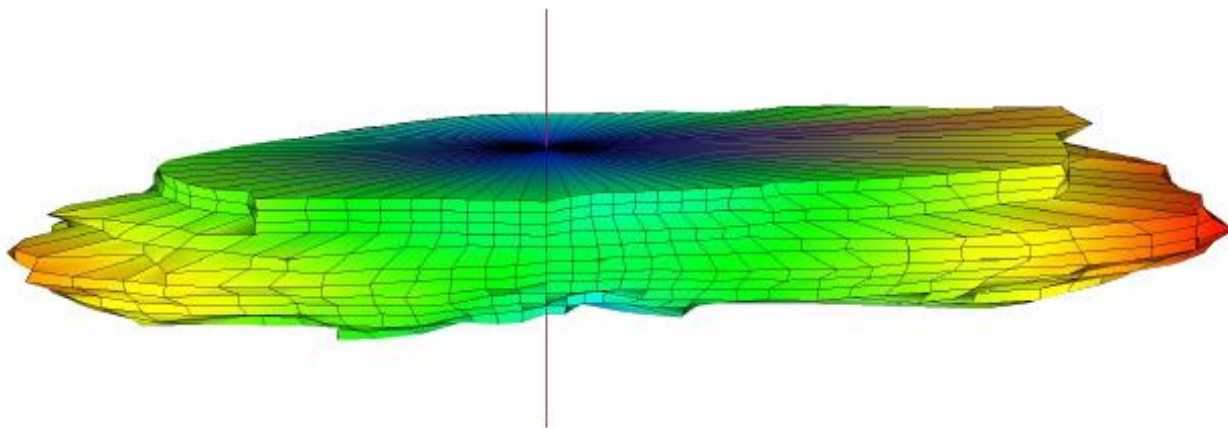
CUSTOMER : CANWHITE SAND  
DATE : 17/12/2021

CAVERN : BRU 92-8  
OPERATION # : 4 - 4200 tonnes



**VIEW FROM NORTH**  
with an overhang of 10°

SCALE 1/500



Radius (R)



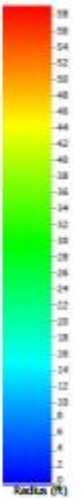
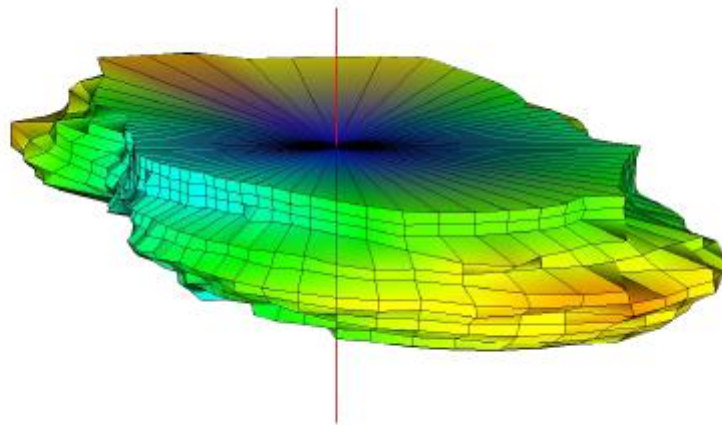
CUSTOMER : CANWHITE SAND  
DATE : 17/12/2021

CAVERN : BRU 92-8  
OPERATION # : 4 - 4200 tonnes



**VIEW FROM EAST**  
with an overhang of 10°

SCALE 1/500





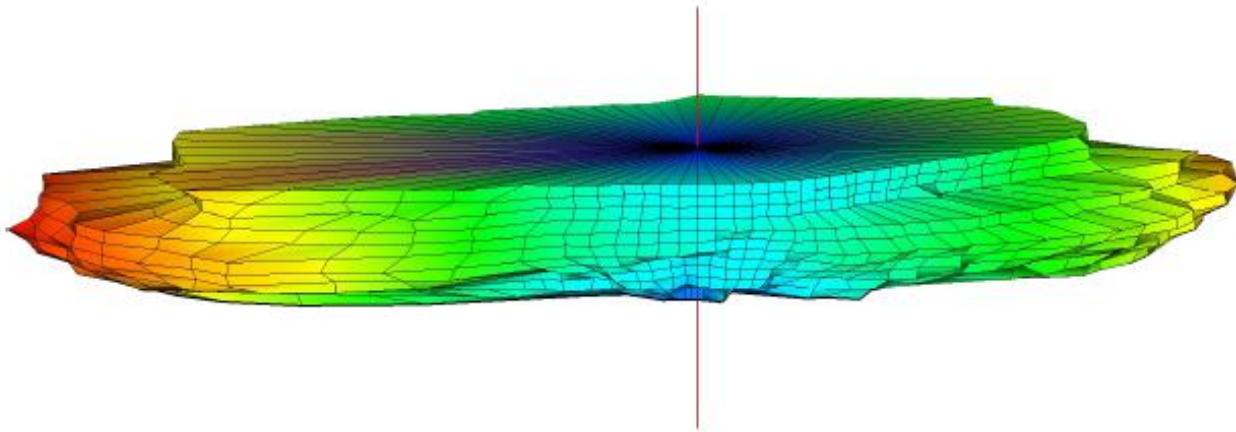
CUSTOMER : CANWHITE SAND  
DATE : 17/12/2021

CAVERN : BRU 92-8  
OPERATION # : 4 - 4200 tonnes



**VIEW FROM SOUTH**  
with an overhang of 10°

SCALE 1/500



Metres (m)



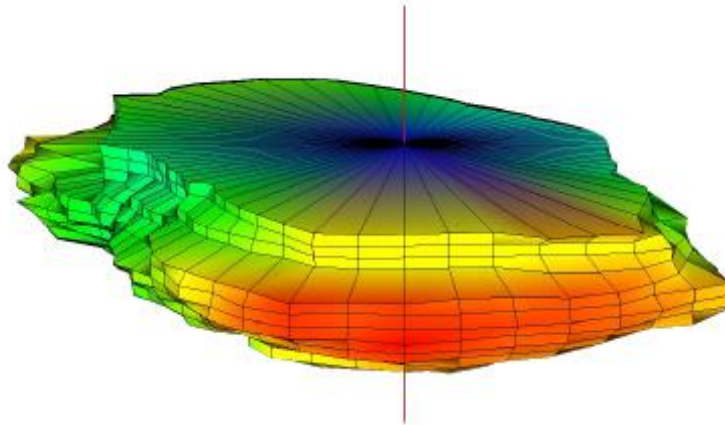
CUSTOMER : CANWHITE SAND  
DATE : 17/12/2021

CAVERN : BRU 92-8  
OPERATION # : 4 - 4200 tonnes



**VIEW FROM WEST**  
with an overhang of 10°

SCALE 1/500





CUSTOMER	CANWHITE SANDS
DATE	10/05/2021
CAVERN	WELL1
OPERATION #	1 (3000 tonnes)
REPORT #	21-3095



CUSTOMER : CANWHITE SANDS  
DATE : 10/05/2021

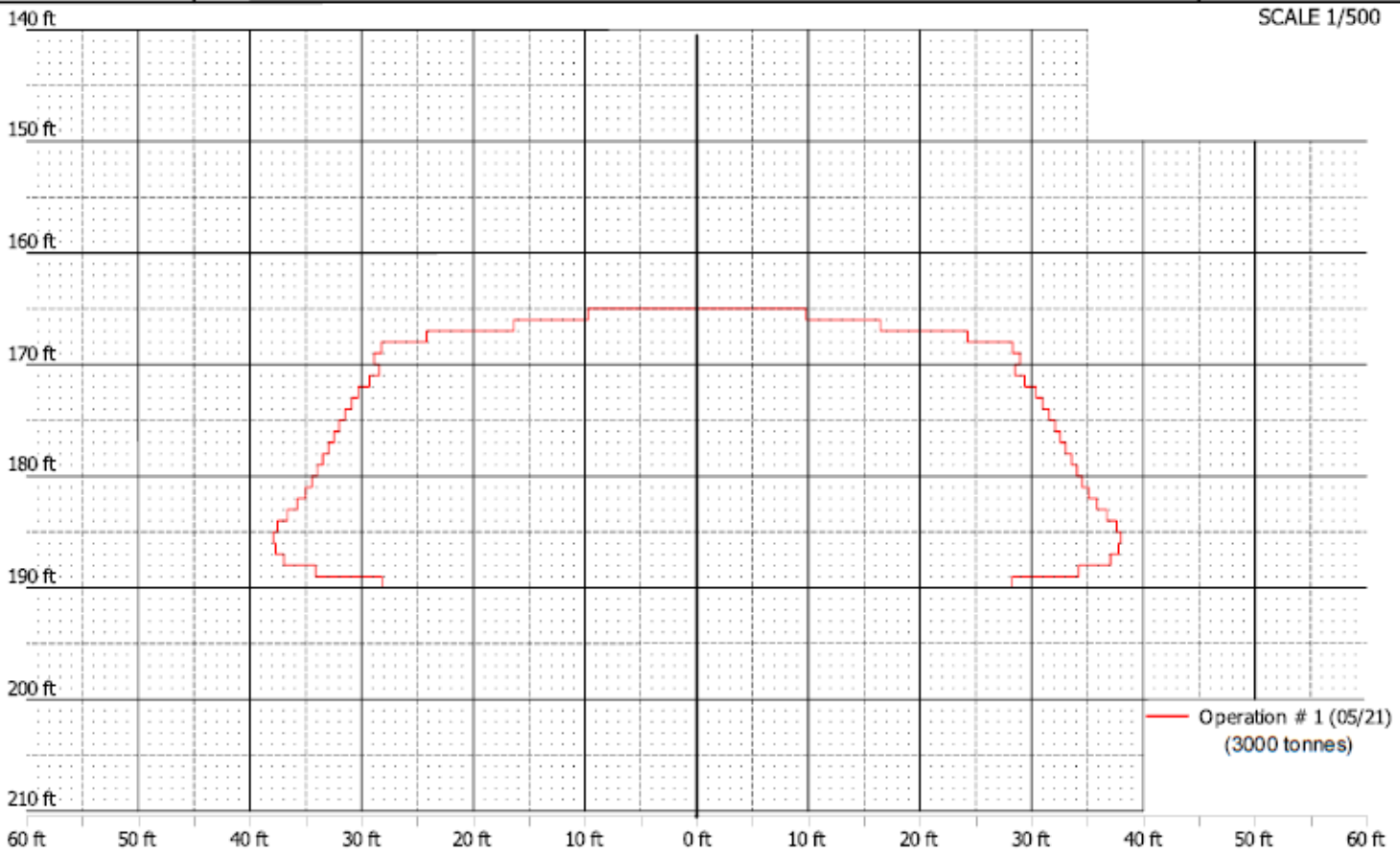
CAVERN : WELL1  
OPERATION # : 1 (3000 tonnes)



### MEAN RADIUS



SCALE 1/500





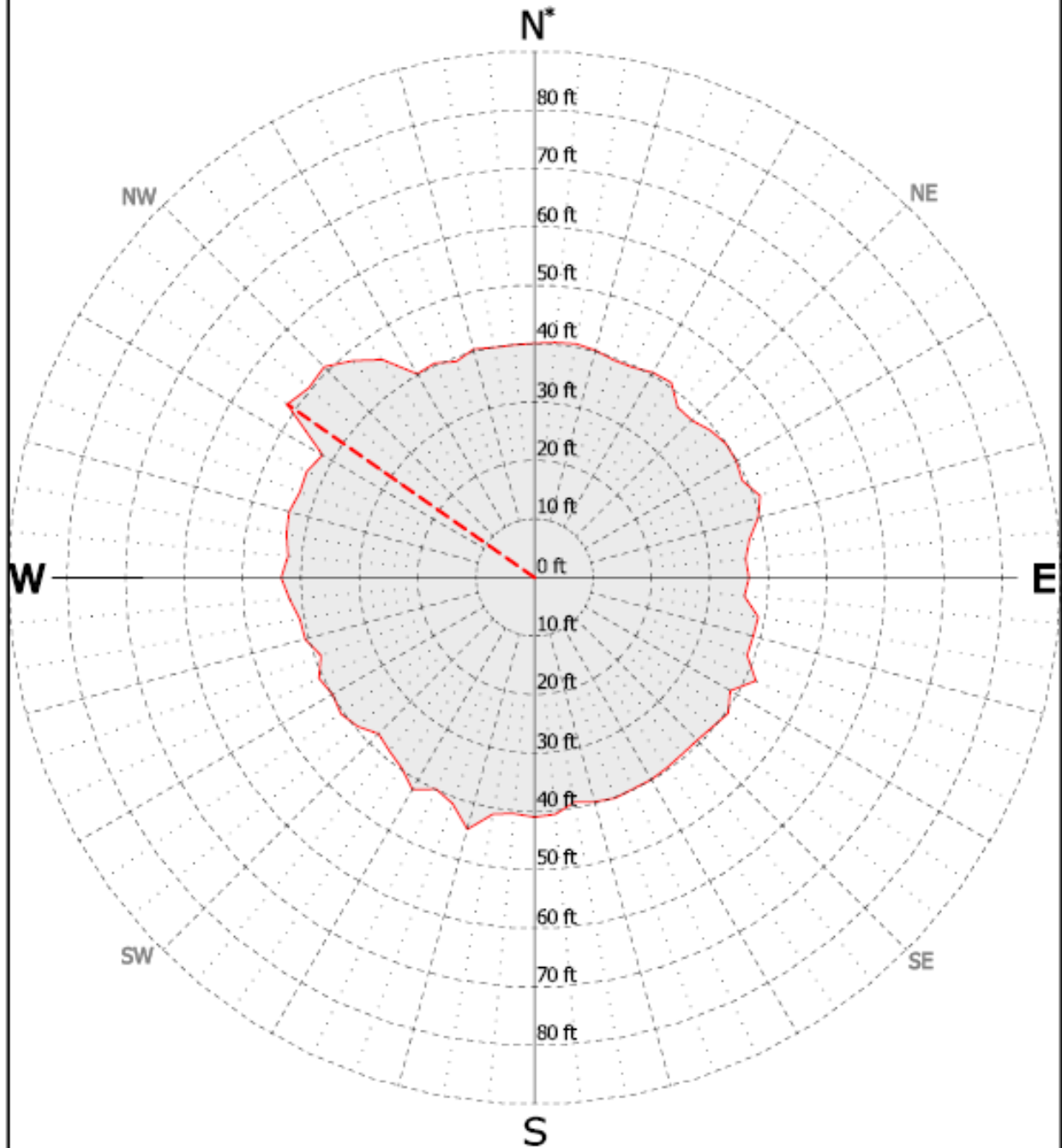
CUSTOMER : CANWHITE SANDS  
DATE : 10/05/2021

CAVERN : WELL1  
OPERATION # : 1 (3000 tonnes)



### MAXIMUM EXTENSION

SCALE 1/1000



— Operation # 1 (05/21)  
(3000 tonnes)

Maximum radius	: 51,66 ft
Orientation maxi. radius*	: N305
Depth maxi. radius	: 167,0 ft
Surface	: 5222,74 ft <sup>2</sup>
Max distance between points	: 93,02 ft

\*All sections are oriented to Magnetic North,

Magnetic Declination= 13,5°



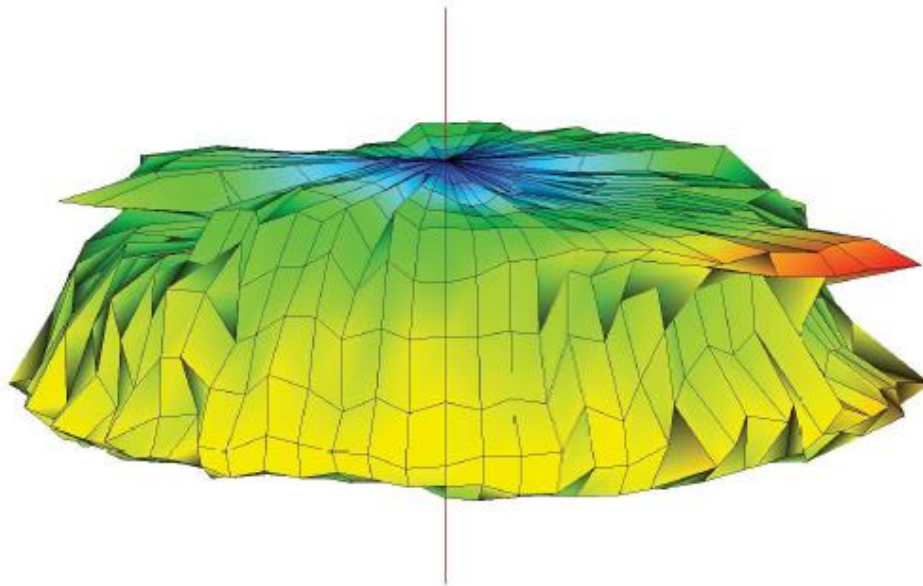
CUSTOMER : CANWHITE SANDS  
DATE : 10/05/2021

CAVERN : WELL1  
OPERATION # : 1 (3000 tonnes)



**VIEW FROM NORTH**  
with an overhang of 10°

SCALE 1/500





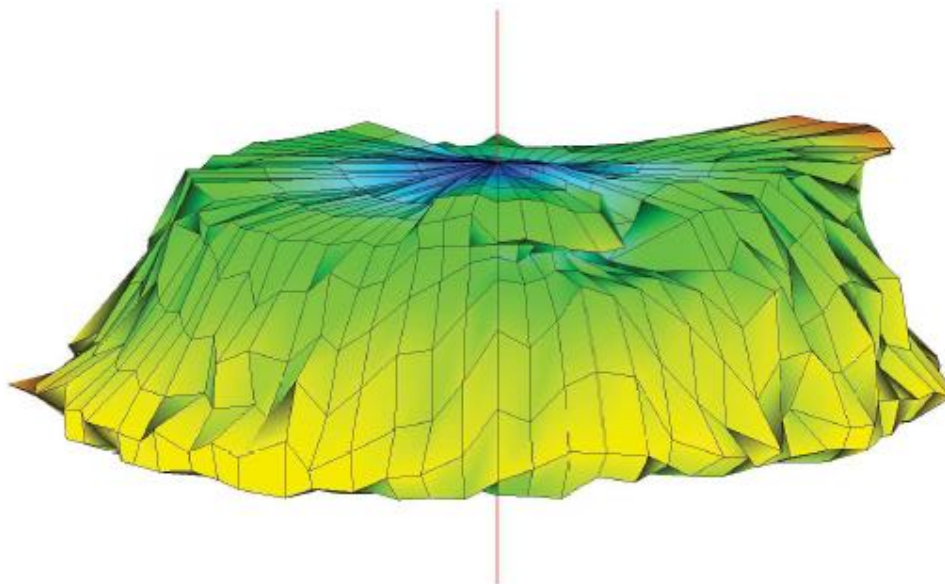
CUSTOMER : CANWHITE SANDS  
DATE : 10/05/2021

CAVERN :WELL1  
OPERATION # :1 (3000 tonnes)



**VIEW FROM EAST**  
with an overhang of 10°

SCALE 1/500





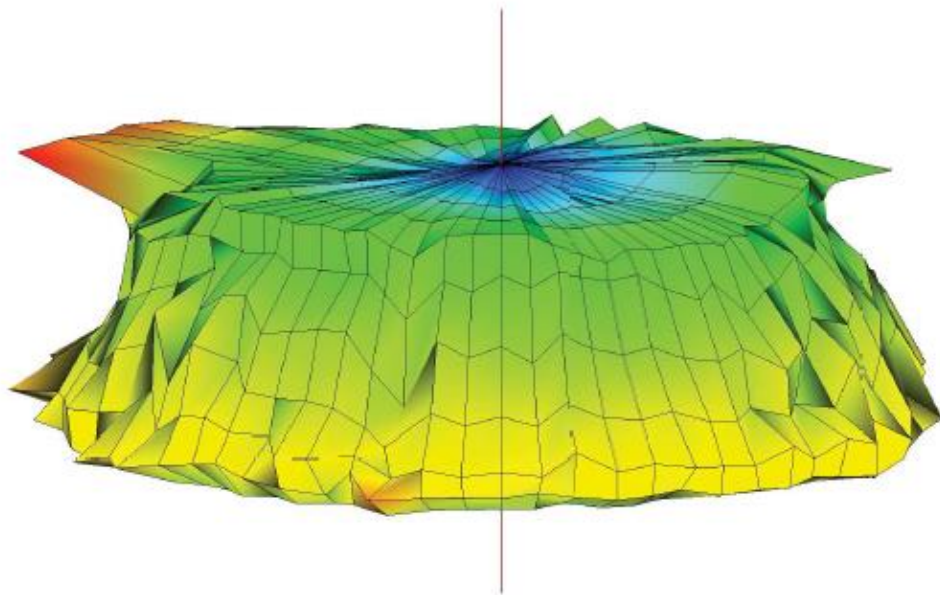
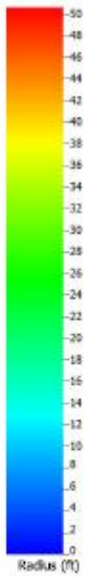
CUSTOMER : CANWHITE SANDS  
DATE : 10/05/2021

CAVERN :WELL1  
OPERATION # :1 (3000 tonnes)



**VIEW FROM SOUTH**  
with an overhang of 10°

SCALE 1/500





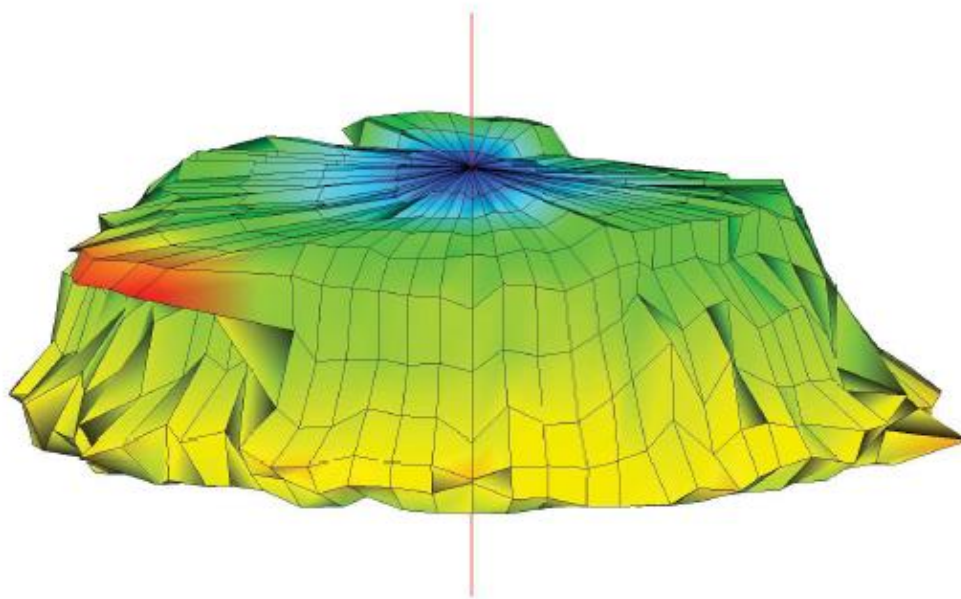
CUSTOMER : CANWHITE SANDS  
DATE : 10/05/2021

CAVERN : WELL1  
OPERATION # : 1 (3000 tonnes)



**VIEW FROM WEST**  
with an overhang of 10°

SCALE 1/500



**Manitoba Clean Environment Commission**  
**Hearing for the Vivian Silica Sand Extraction Project (Project)**  
**Sio Silica Corporation (SSC) Responses to Information Requests (IRs) Round No. 2**  
**Appendix B**  
Bru 92-8 Extraction Test Data  
CEC – IR – 014(1)

SUPPORTING DOCUMENT FOR DRAWDOWN DATA DURING Bru 92-8  
EXTRACTION ACTIVITIES  
January 2023

## Introduction:

The information contained within this Appendix is provided to the CEC upon request. Sio Silica collected this data utilizing manual measurements and transducers placed in monitoring and extraction wells on the site and at a distance away to establish monitoring wells that were used for the Hydrogeology and Geochemistry Assessment. This data has not been interpreted and is provided for information purposes. This data was collected during an extraction test in August 2021 during which time, Sio stopped testing intentionally for a sonar logging exercise, and then resumed testing.

## Groundwater Level Monitoring:

Manual water level measurements were collected by Sio Silica staff from wells Bru 92-1, Bru 95-5, Bru 95-7 and Bru 92-2 prior to commencement of sand extraction on August 11, 2021. Sand extraction occurred from August 15-26. Manual water levels were collected again on August 31 prior to retrieval of pressure transducers. Manual water level measurements were collected in feet of depth below ground surface (bgs) and converted to meters below ground surface (mbgs).

Pressure transducers outfitted with dataloggers were installed in monitoring wells Bru 92-1, Bru 95-5, Bru 95-7 and Bru 92-2 on August 11, 2021 and continuously recorded water level and temperature measurements until they were recovered on August 31. Water level data obtained from pressure transducers installed were corrected for barometric pressure fluctuations using measurements collected by the barometric pressure logger from August 11 to August 26. Unfortunately, the barometric pressure datalogger memory reached capacity nine hours after the end of sand extraction, and water level data could not be corrected to remove the effects of barometric pressure fluctuations from August 26 to August 31. Corrected groundwater level measurements were subsequently converted to potentiometric groundwater elevations using surveyed borehole collar coordinates and manual water level measurements collected immediately prior to deployment on August 11, 2021.

**Figure 1** presents manual water level measurements and corrected groundwater elevations for monitoring wells Bru 92-1, Bru 95-5, Bru 95-7 and Bru 92-2 between August 15 and August 31, 2021. All pressure transducer data collected after 3:59 AM on August 26, 2021 are shown without barometric pressure corrections. The approximate 10 m difference in groundwater elevations is as a result of the missing barometric pressure data and is not representative of actual changes in groundwater levels. This is supported by the similar manual water level measurements collected before (August 11) and after (August 31) sand extraction activities.

**Figure 2** demonstrates the maximum amount of drawdown during the sand extraction activities on Bru 92-8, the radius of influence show that very minimal drawdown occurs outside a 1km radius with the drawdown being less than 0.5m. This data also supports and is well within the expected drawdown values provided in the Hydrogeology and Geochemistry Assessment Report.

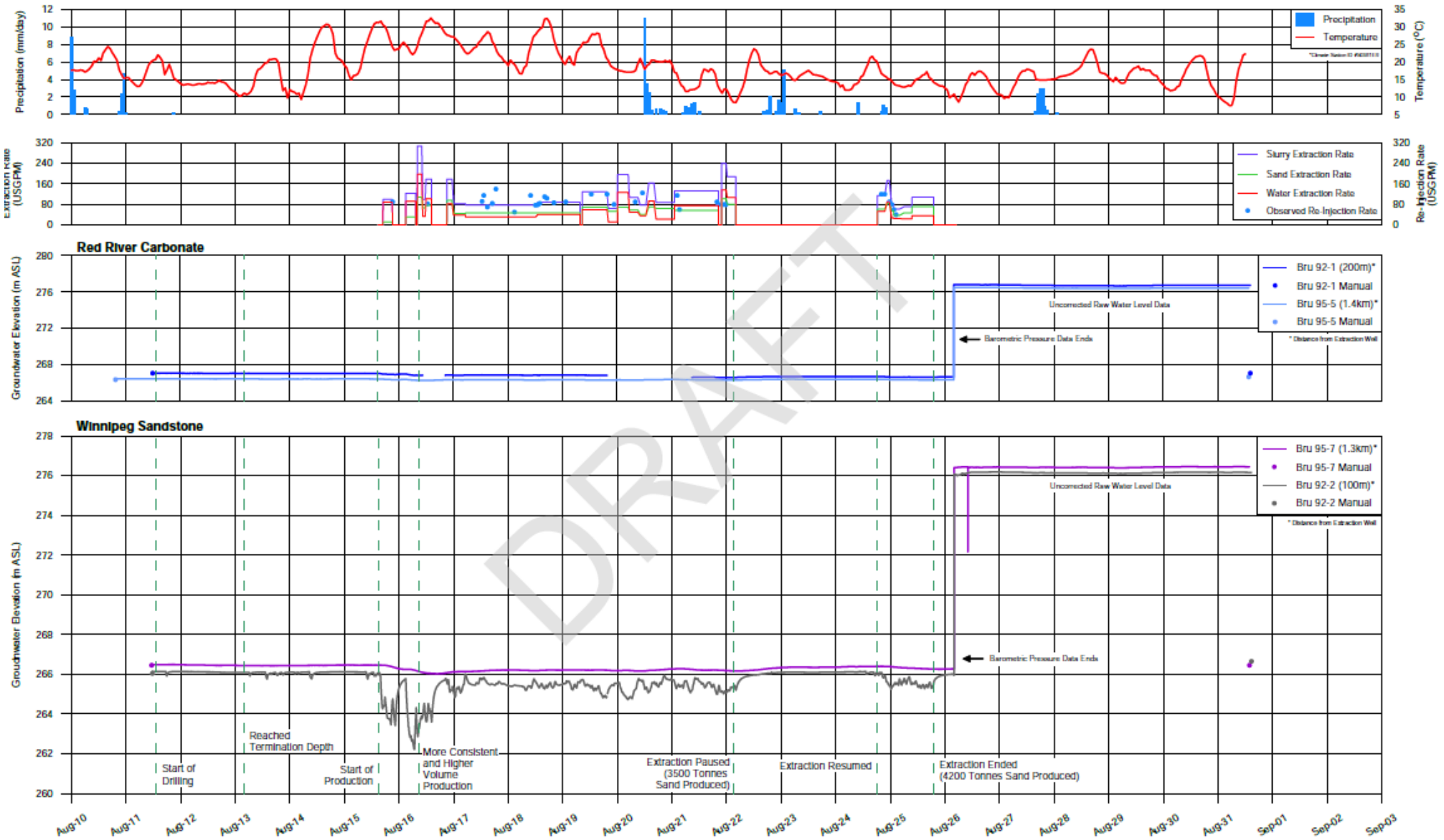
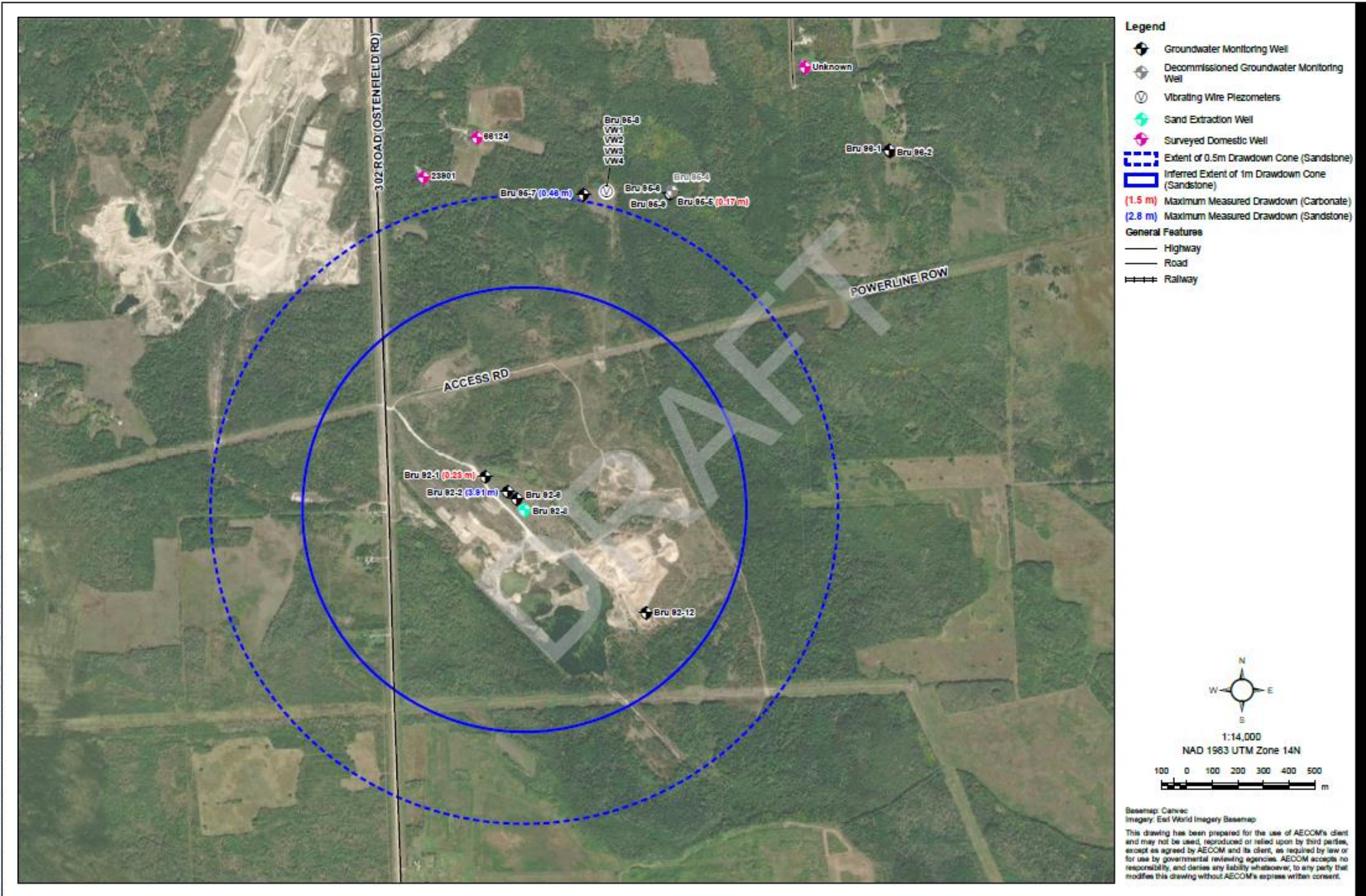


Figure 1: Groundwater Levels During Extraction Test on Bru 92-8



**Figure 2: Maximum Drawdown During Extraction Testing on Bru 92-8**

**Manitoba Clean Environment Commission**  
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**Sio Silica Corporation (SSC) Responses to Information Requests (IRs) Round No. 2**  
**Appendix C**  
Extraction Wells History  
CEC – IR – 014(1)

## SIO SILICA EXTRACTION WELLS HISTORY

Date	Well Name	Claim	BH License	Latitude	Longitude	Tonnage Extracted (tonnes)
2018-05-31	Bru 82-3	Bru 82	BH 17-17	49.84084	-96.49614	505
2018-10-04	Bru 82-5	Bru 82	BH 6-18	49.84084	-96.49614	707
2019-05-28	Bru 82-8	Bru 82	BH 47-18	49.8421	-96.4976	1281
2019-10-08	Bru 82-10	Bru 82	BH 17-19	49.8415	-96.499	2189
2019-09-19	Bru 82-11	Bru 82	BH 17-19	49.8418	-96.4992	1793
2019-09-12	Bru 82-14	Bru 82	BH 17-19	49.84192	-96.49863	2074
2019-07-17	Bru 95-1	Private	BH 7-19	49.8732	-96.4638	596
2019-06-28	Bru 95-2	Private	BH 7-19	49.8732	-96.4637	414
2019-07-16	Bru 95-3	Private	BH 7-19	49.8731	-96.4638	1069
2020-07-28	Bru 154-1	Bru 154	BH 7-20	49.69213	-96.46988	953
2020-08-16	Den 304-1	Den 304	BH 8-20	49.6043	-96.4466	954
2020-10-11	BH02-20B	Private	BH 2-20	49.88873	-96.47094	3000
2021-04-20	Bru 92-2	Bru 92	BH 2-21	49.86298	-96.47357	3000
2021-04-20	Bru 92-3	Bru 92	BH 2-21	49.86314	-96.47333	2357
2021-08-11	Bru 92-8	Bru 92	BH 5-21	49.8623	-96.4727	4200