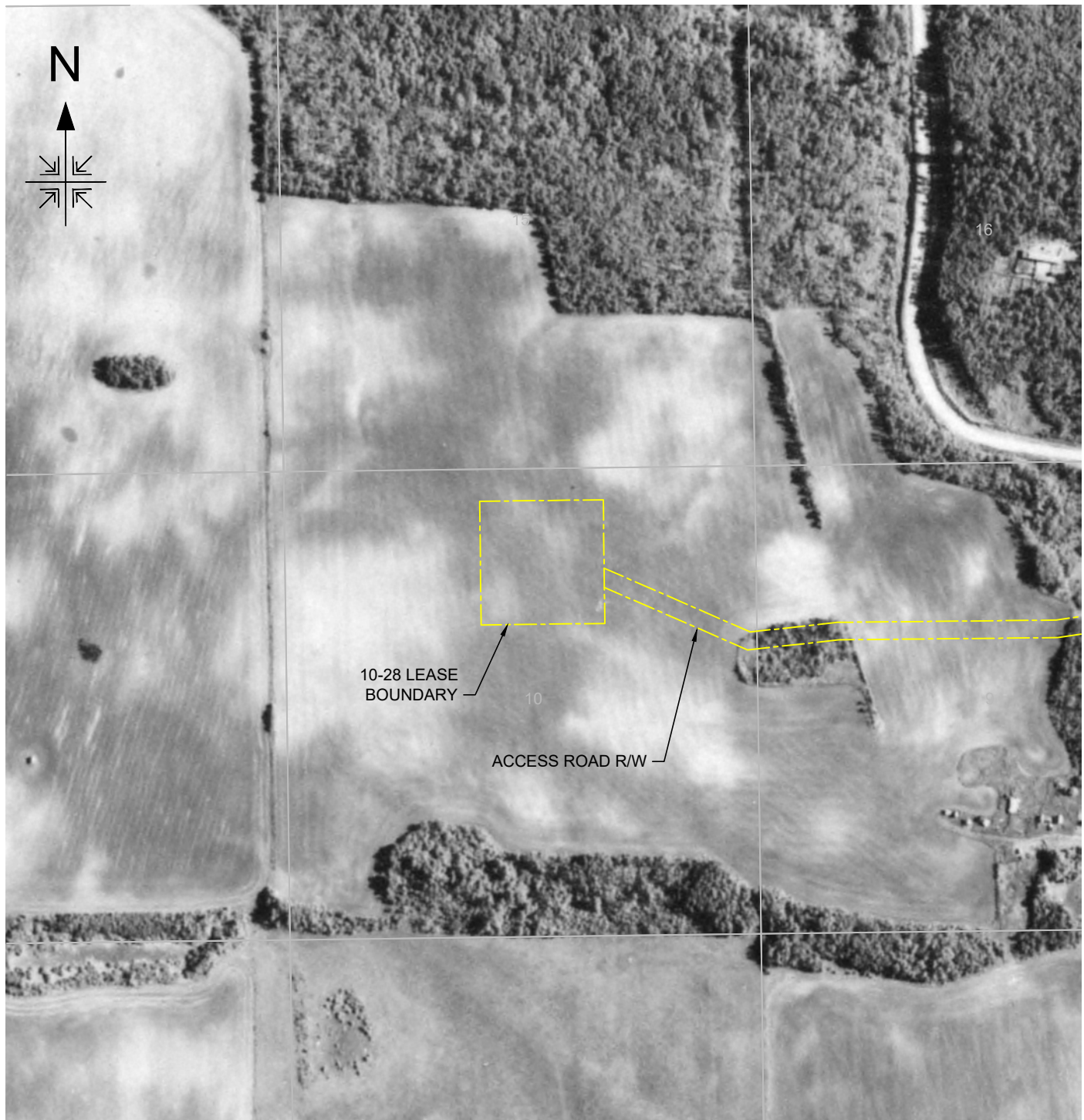


Phase 1



1991 AERIAL PHOTO SOURCE: ALBERTA ENVIRONMENT AND PARKS AIR PHOTO DISTRIBUTION (AS4162-053)

LEGEND

⊙ WELL CENTRE
(NOT PRESENT)

NOTES:

LOCATIONS ARE APPROXIMATE.

0 50 100 200m
Scale 1 : 5000

**1991 HISTORICAL AERIAL PHOTO
(PRE-DISTURBANCE)**

Date:	19-FEB-20	Drawn by:	CD	Revised by:	CD
File name:		Requested by:	CT	Approved by:	CT
					Figure: 2





LEGEND

⊙ WELL CENTRE

NOTES:

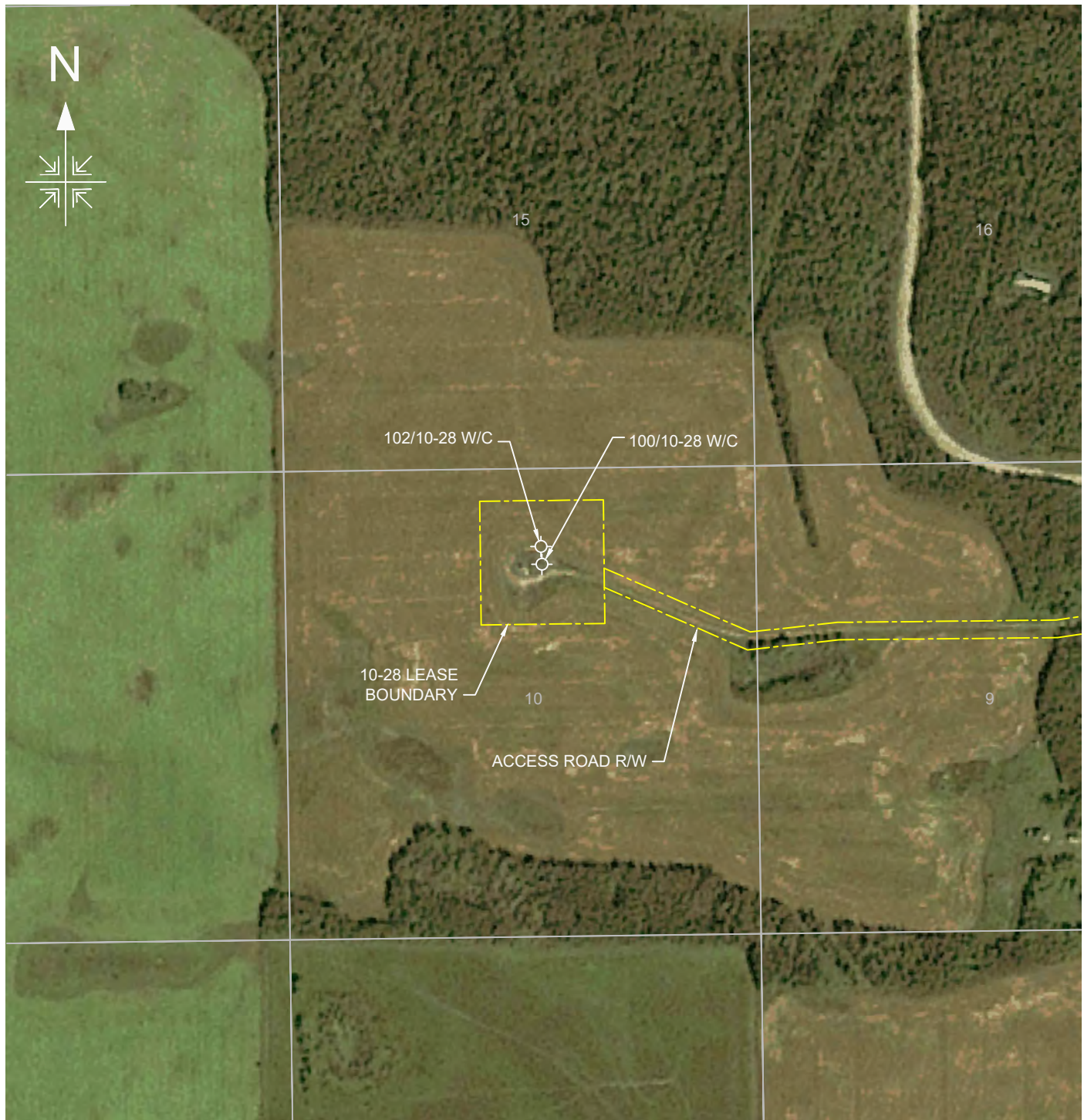
LOCATIONS ARE APPROXIMATE.

0 50 100 200m
Scale 1 : 5000



2006 HISTORICAL AERIAL PHOTO

Date:	05-FEB-20	Drawn by:	LH/CD	Revised by:	-
File name:		Requested by:	CT	Approved by:	CT
					Figure: 5



LEGEND

 WELL CENTRE

NOTES:

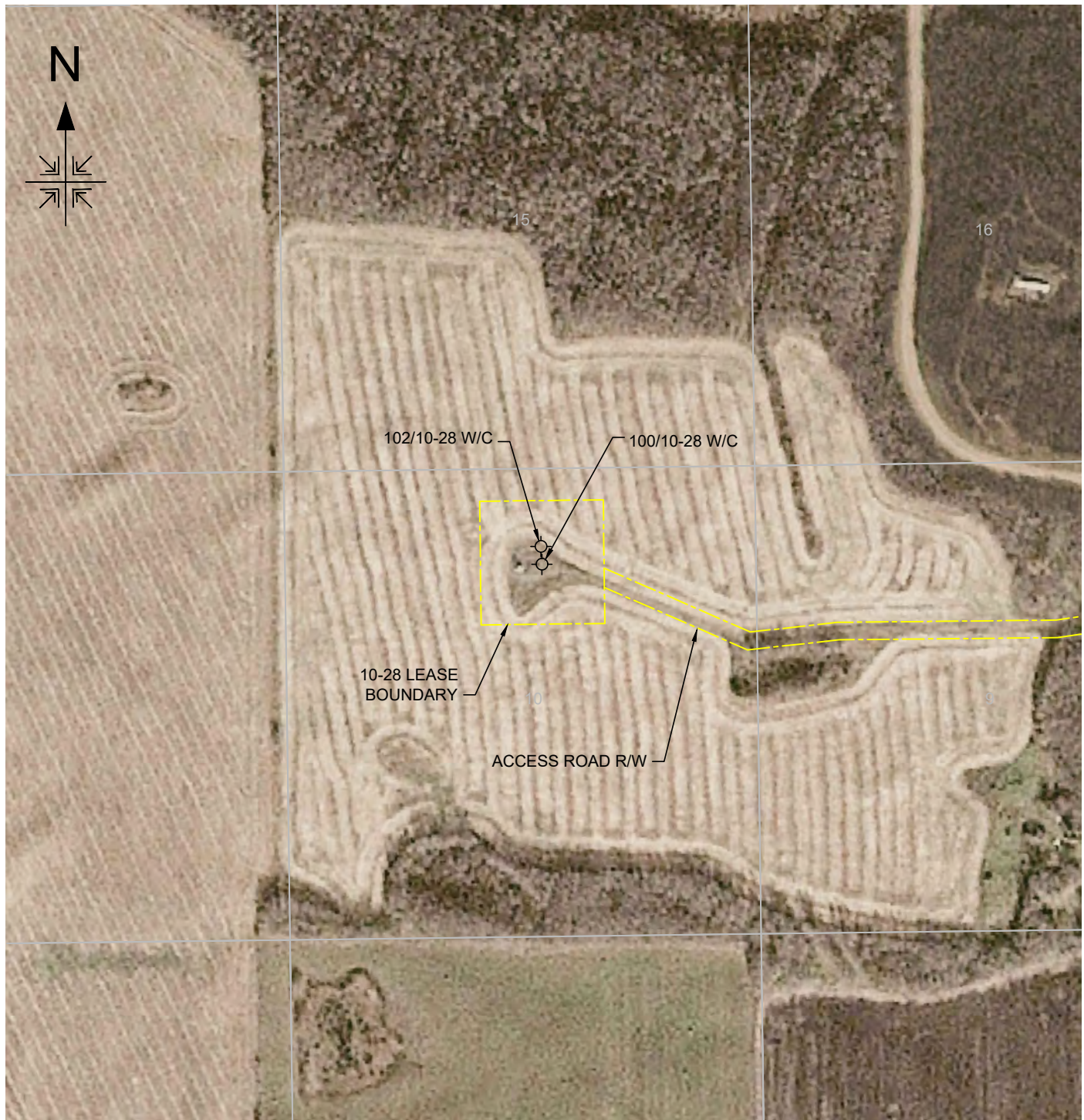
LOCATIONS ARE APPROXIMATE.

0 50 100 200m
Scale 1 : 5000



2013 HISTORICAL AERIAL PHOTO

Date:	05-FEB-20	Drawn by:	CD	Revised by:	-
File name:		Requested by:	CT	Approved by:	CT
					Figure: 7



LEGEND

WELL CENTRE

NOTES:

LOCATIONS ARE APPROXIMATE.

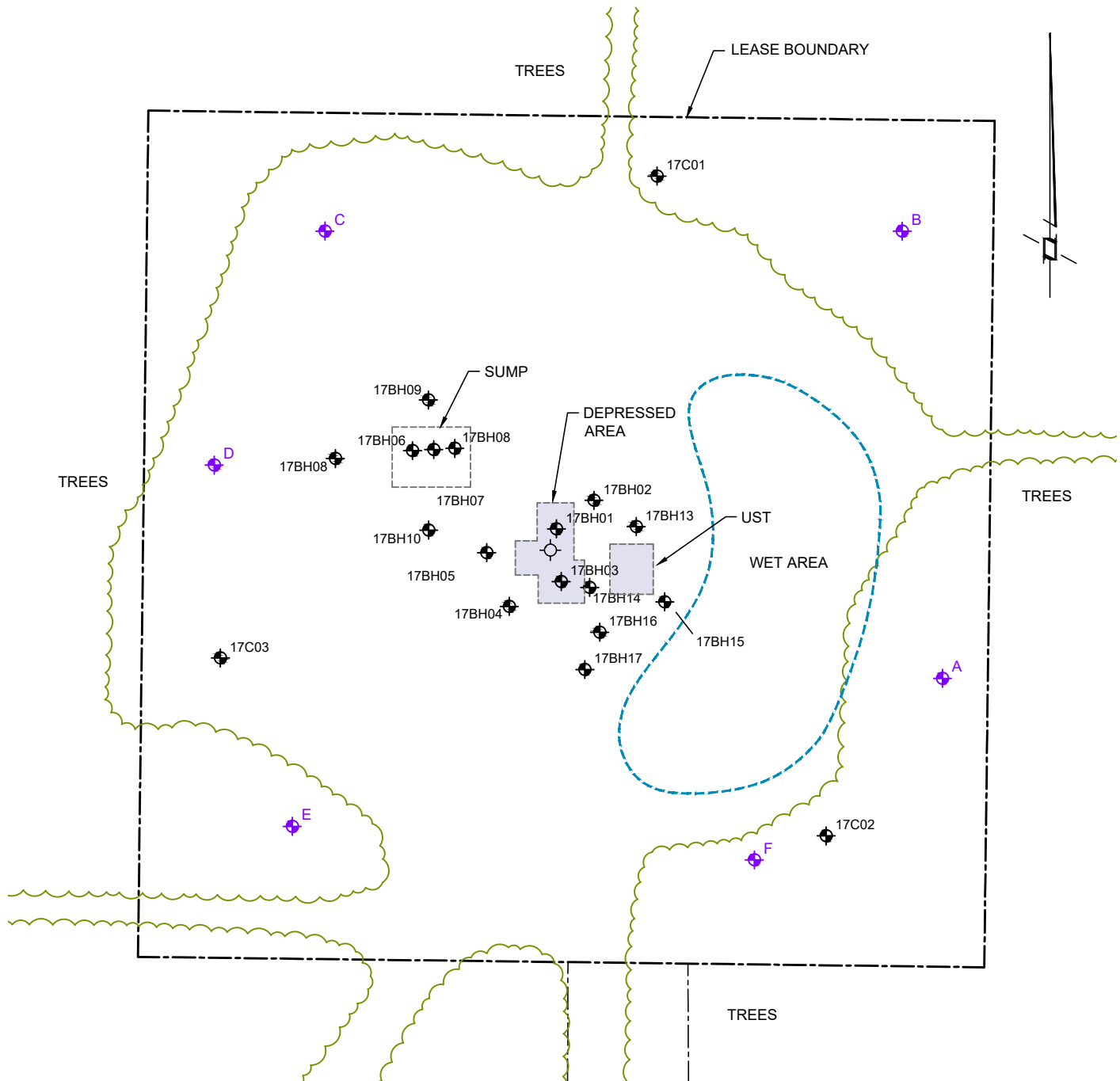
0 50 100 200m
Scale 1 : 5000



2019 HISTORICAL AERIAL PHOTO

Date:	05-FEB-20	Drawn by:	CD	Revised by:	-
File name:		Requested by:	CT	Approved by:	CT
					Figure:
					9

Phase 2



NOTES:

LOCATIONS ARE APPROXIMATE.

0 5 10 20 30m
Scale 1 : 750

LEGEND



BOREHOLE LOCATION



FLARE PIT SEARCH BOREHOLE



10-04 WELL CENTRE



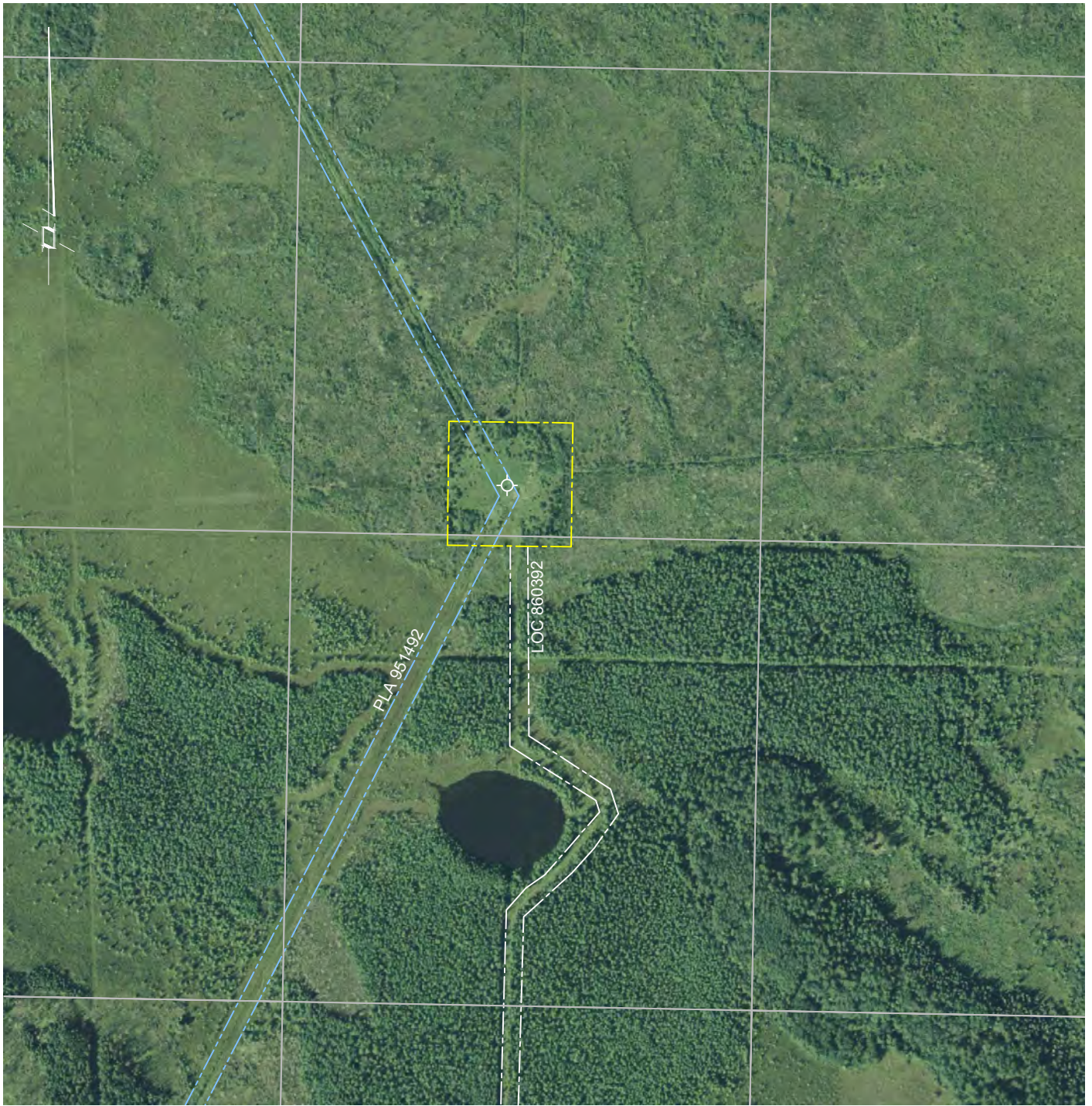
FORMER FEATURE



DEPRESSED AREA (APPROX. 0.5m DEEP DUE TO RECLAMATION/EXCAVATION)

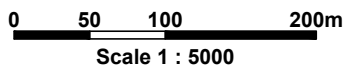
SITE DIAGRAM





NOTES:

LOCATIONS ARE APPROXIMATE.



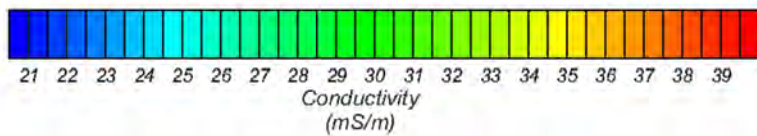
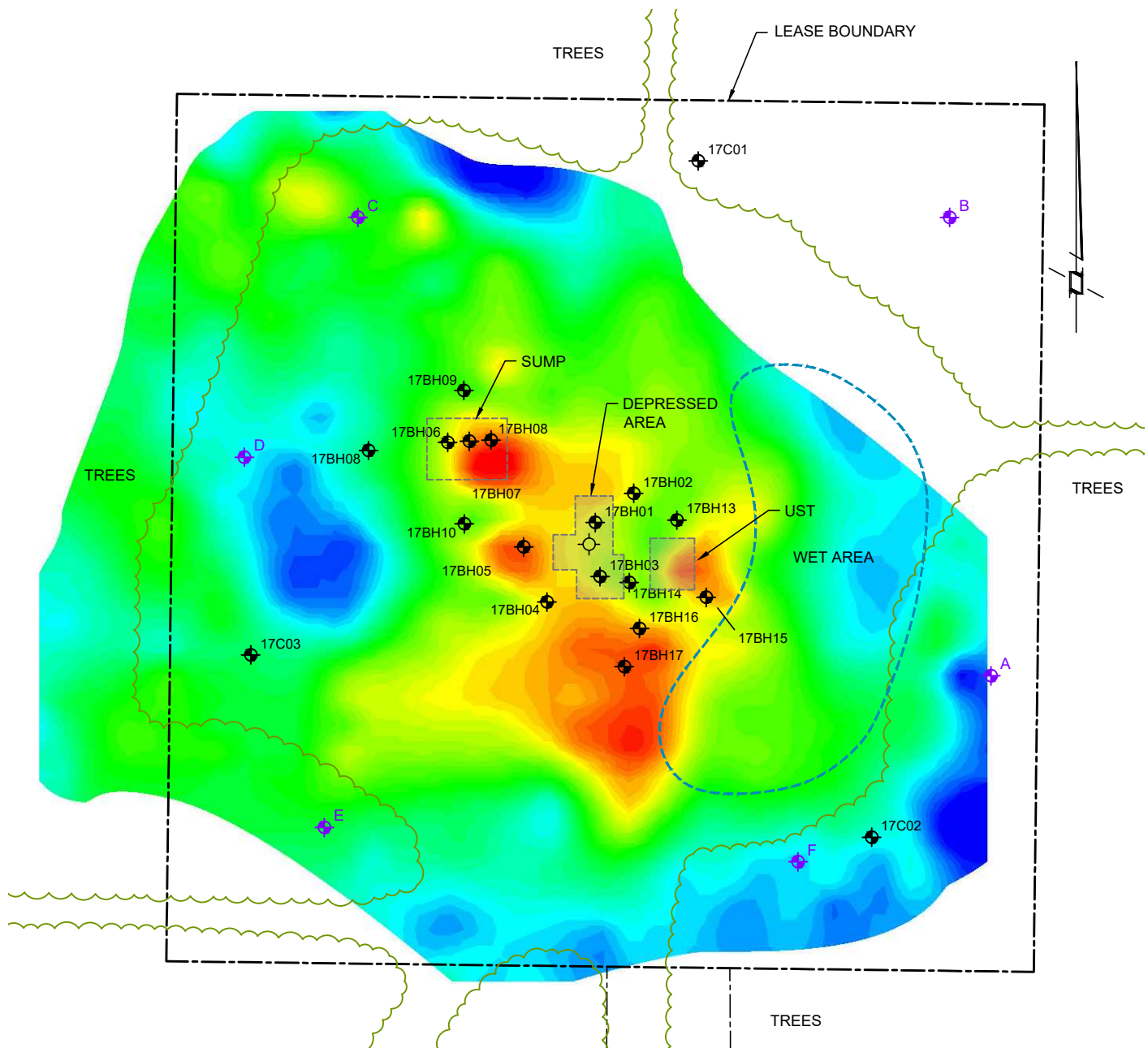
LEGEND

 WELL CENTRE

 PIPELINE ROW
(SOURCE: ABADATA)



QUARTER SECTION DETAIL



NOTES:

LOCATIONS ARE APPROXIMATE.

JUNE 13, 2017 EM31 SURVEY
CONDUCTED BY AKS GEOSCIENCE.

0 5 10 20 30m
Scale 1 : 750

LEGEND

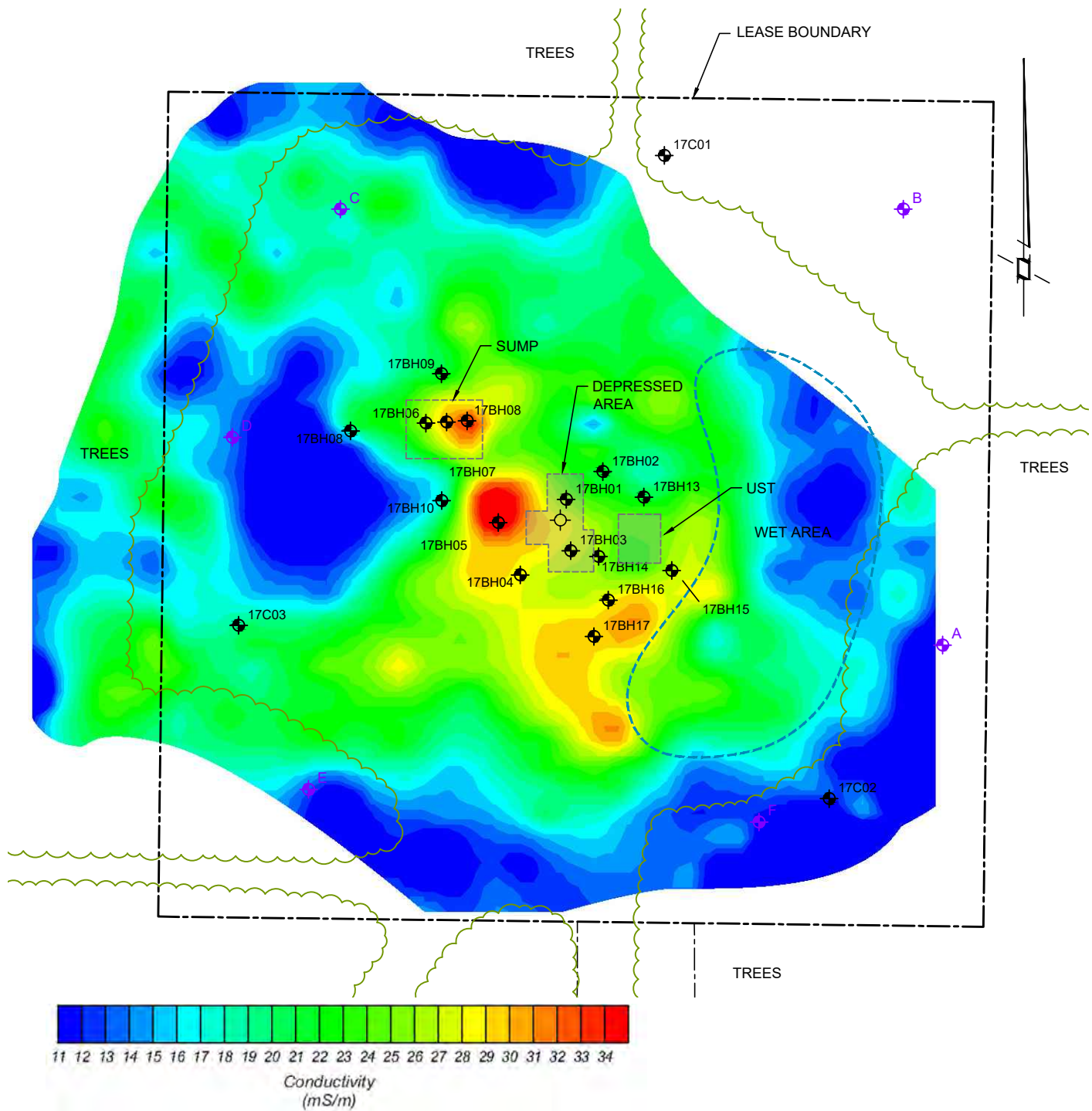
- BOREHOLE LOCATION
- FLARE PIT SEARCH BOREHOLE
- 10-04 WELL CENTRE

FORMER FEATURE

DEPRESSED AREA (APPROX. 0.5m DEEP DUE TO RECLAMATION/EXCAVATION)



EM31 APPARENT CONDUCTIVITY SURVEY



NOTES:

LOCATIONS ARE APPROXIMATE.

JUNE 13, 2017 EM38 SURVEY
CONDUCTED BY AKS GEOSCIENCE.

0 5 10 20 30m
Scale 1 : 750

LEGEND



BOREHOLE LOCATION



FLARE PIT SEARCH BOREHOLE



10-04 WELL CENTRE



FORMER FEATURE



DEPRESSED AREA (APPROX. 0.5m DEEP DUE
TO RECLAMATION/EXCAVATION)



EM38 APPARENT CONDUCTIVITY SURVEY

Remediation



NOTES:

LOCATIONS ARE APPROXIMATE.

0 50 100 200m
Scale 1 : 5000

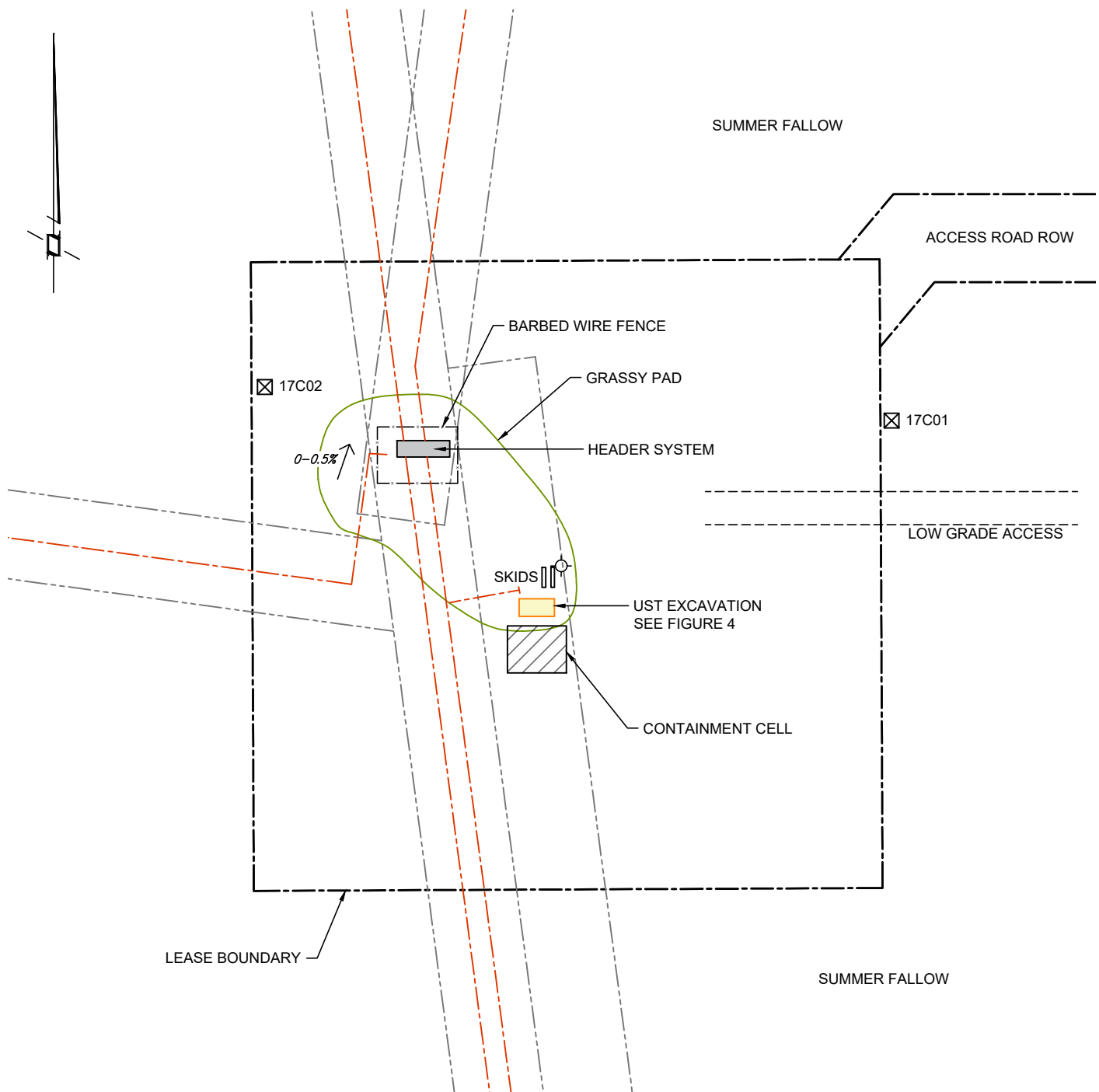
LEGEND

-  WELL CENTRE
-  DISPOSITION
(SOURCE: ABADATA)

QUARTER SECTION DETAIL

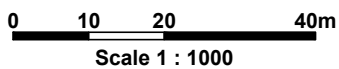


Date: 06-OCT-17	Drawn by: LH		Figure: 2
File name:	Requested by: MG		



NOTES:

LOCATIONS ARE APPROXIMATE.



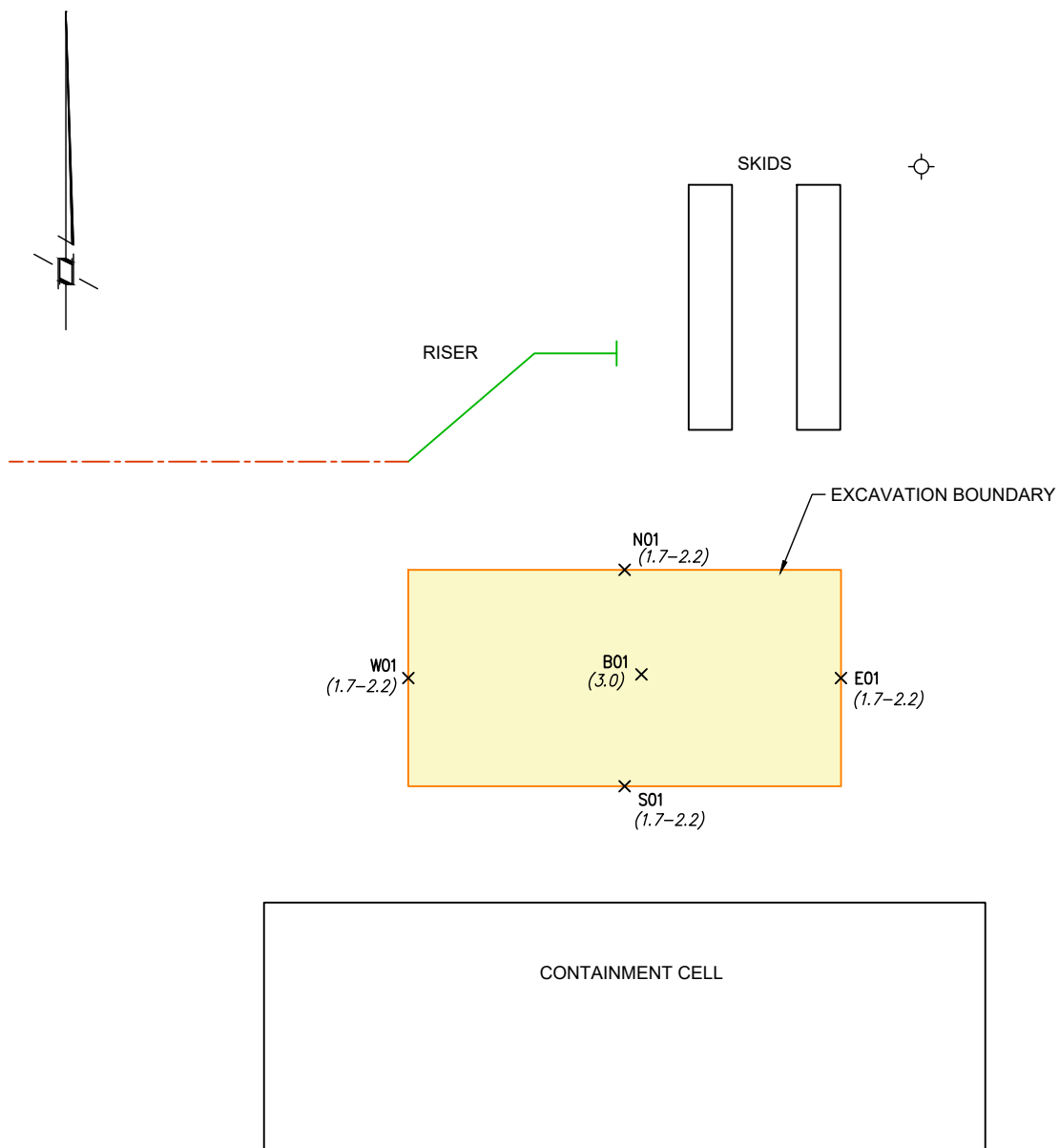
LEGEND

- 100/10-06 WELL CENTRE
- CONTROL TEST PIT
- CNRL UNDERGROUND PIPELINE
- DISPOSITION (SOURCE: ABADATA)
- 2-5% GROUND SLOPE DIRECTION & GRADIENT

SITE DIAGRAM



Date:	04-DEC-17	Drawn by:	LH	Figure:	3
File name:		Requested by:	MG		



NOTES:

LOCATIONS ARE APPROXIMATE.

0 1 2 4m
Scale 1 : 100

LEGEND

- × CONFIRMATORY SOIL SAMPLE
- ⊗ 100/10-06 WELL CENTRE
- (1.7-2.2) SAMPLE DEPTH (mbgl)
- UNDERGROUND PIPELINE

UST EXCAVATION DIAGRAM



Date: 06-OCT-17

Drawn by: LH

File name:

Requested by: MG

Figure:

4

Reclamation



LEGEND

-  WELL CENTRE
 DISPOSITION
 (SOURCE: ABADATA)

NOTES:

LOCATIONS ARE APPROXIMATE.

0 50 100 200m
 Scale 1 : 5000

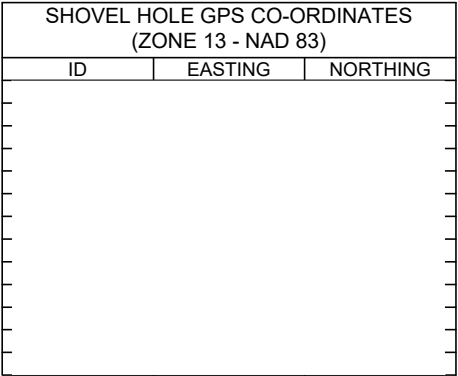
QUARTER SECTION DETAIL

Date:	Drawn by: CD	Revised by: -
File name:	Requested by:	Approved by:



Figure:

2



Groundwater Flow Map



0 25 50 100m
Scale 1 : 2000

LEGEND

SITE

DRAFT

AERIAL OVERVIEW



Date:	Drawn by: LH		Figure: 2
File name:	Requested by:		



DRAFT

SITE DIAGRAM

Date:	Drawn by: LH		Figure:
File name:	Requested by:		3



LEGEND

-  MONITORING WELL
- 95.77 GROUNDWATER ELEVATION (mard)
- 96.25 — GROUNDWATER ELEVATION CONTOUR (mard)
-  INTERPRETED GROUNDWATER FLOW DIRECTION

NOTES:

LOCATIONS ARE APPROXIMATE.

DRAFT

2019 GROUNDWATER FLOW MAP



0 5 10 20m
Scale 1 : 400

Date:	Drawn by: LH	Figure: 4
File name:	Requested by:	

Conceptual Site Model

LEGEND

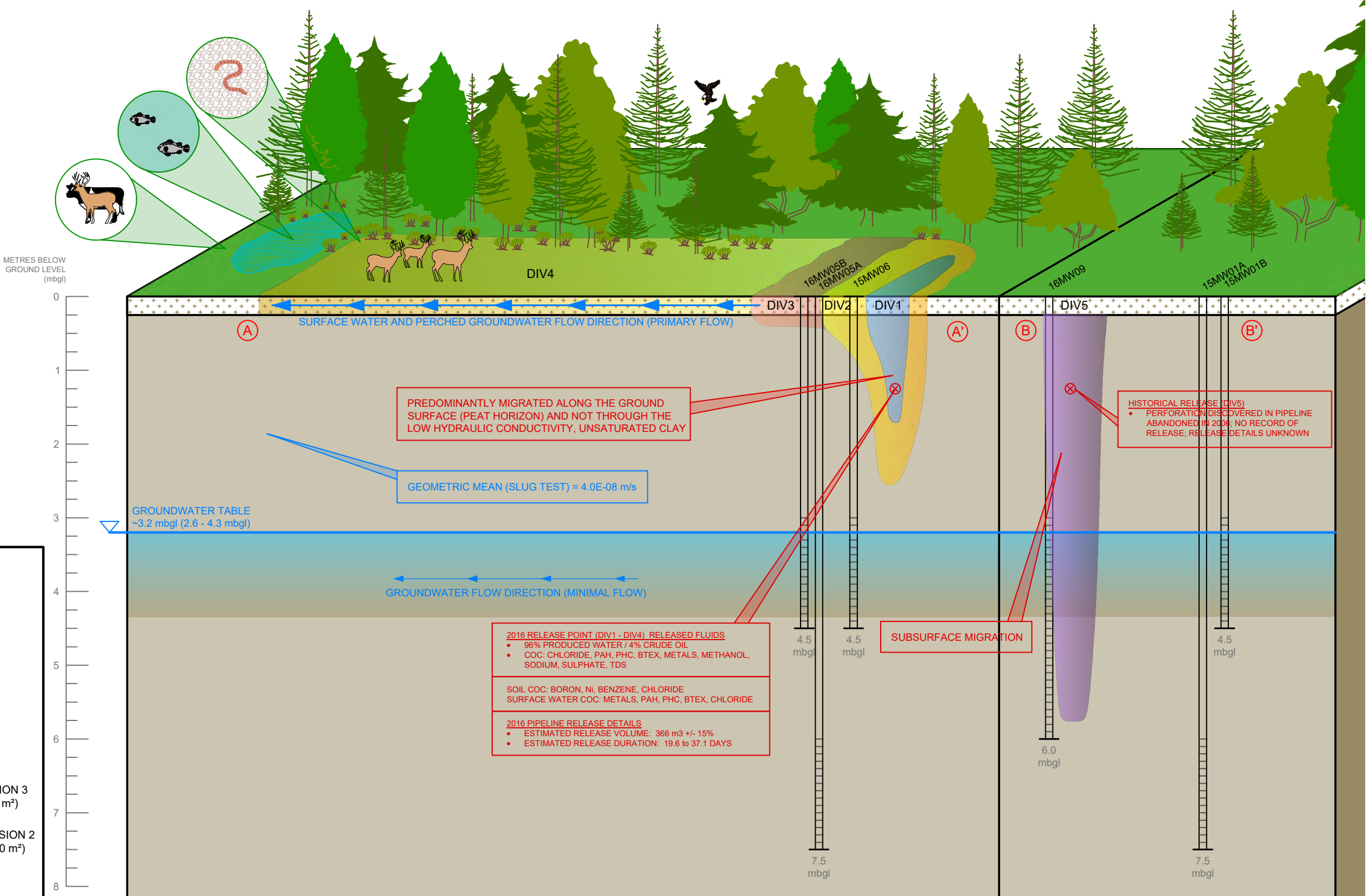
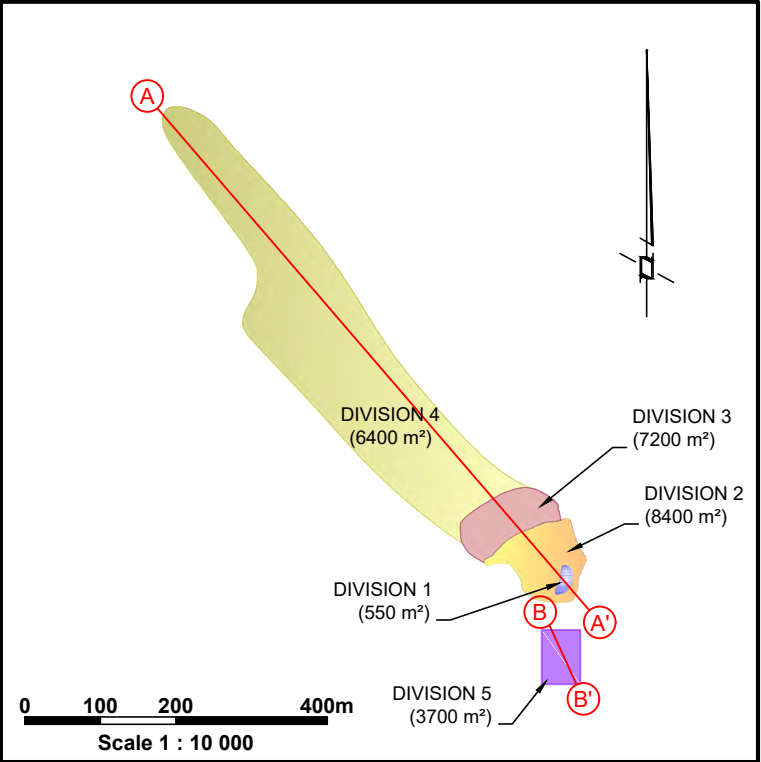
-  ORGANICS / SURFACE WATER
8-42 cm (AVG 26.6 cm)
-  CLAY TO SILTY CLAY
-  PIPELINE (DEPTH ~1.2-1.4 mbgl)

ECOLOGICAL EXPOSURE PATHWAYS

- ECOLOGICAL DIRECT SOIL CONTACT
- NUTRIENT ENERGY AND RECYCLING
- WILDLIFE SOIL AND FOOD INGESTION
- WILDLIFE WATERING
- FRESHWATER AQUATIC LIFE
- DENE THA FIRST NATION TRADITIONAL USE
- LIVESTOCK SOIL AND FOOD INGESTION**
- LIVESTOCK WATERING**

**WHERE WILDLIFE GUIDELINES DON'T EXIST

LAND USE: NATURAL AREAS
ECOSITE TYPE: SHRUBBY FEN
MOISTURE REGIME: HYGRIC TO SUBHYDRIC
SOIL TEXTURE: FINE



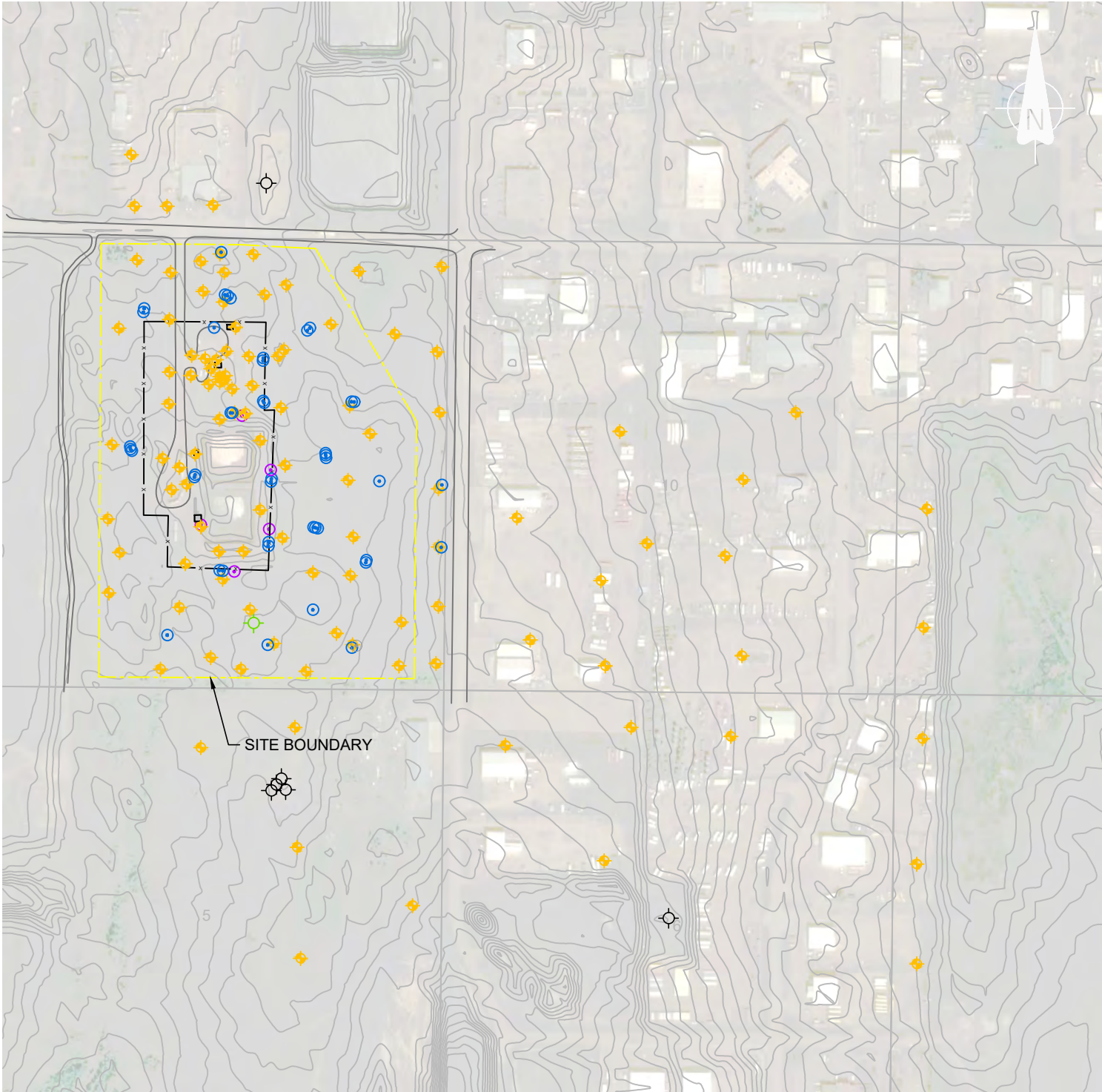
NOT TO SCALE



CONCEPTUAL SITE MODEL - INITIAL SITE CHARACTERIZATION

Date:	Drawn by:	Requested by:	Figure: 1

Geological Cross-Sections



Legend

-  Borehole
-  Monitoring Well
-  Extraction Well
-  Well Centre
-  Well Centre (to be drilled)

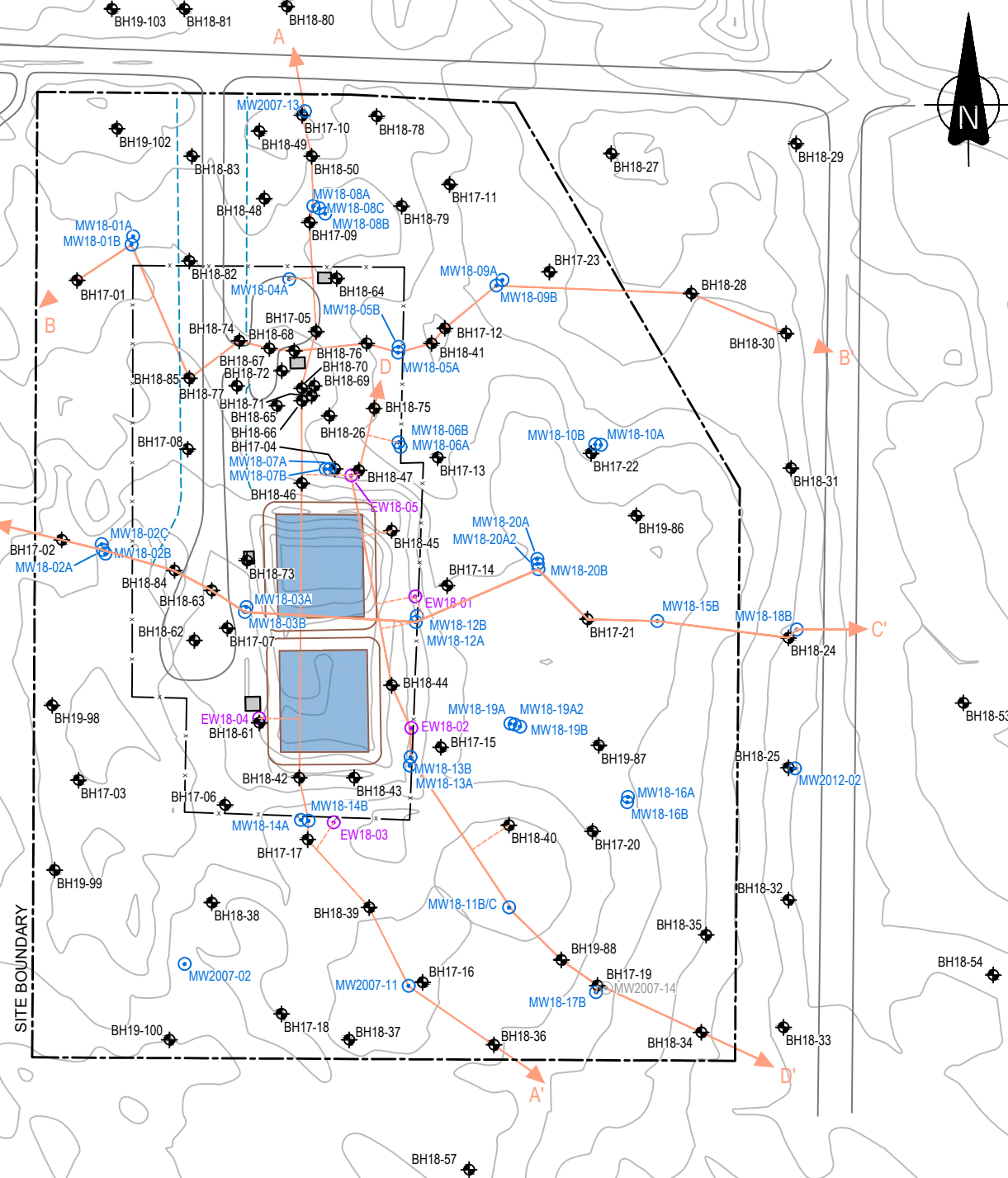
0 10 20 40m
Scale 1 : 1000

Site Overview

logo

Figure:

1



Legend

-  Borehole
-  Monitoring Well
-  Abandoned Monitoring Well
-  Extraction Well
-  Building
-  Brine Pond
-  Fence
-  Ditch
-  Cross-Section Location
-  Offset from Section

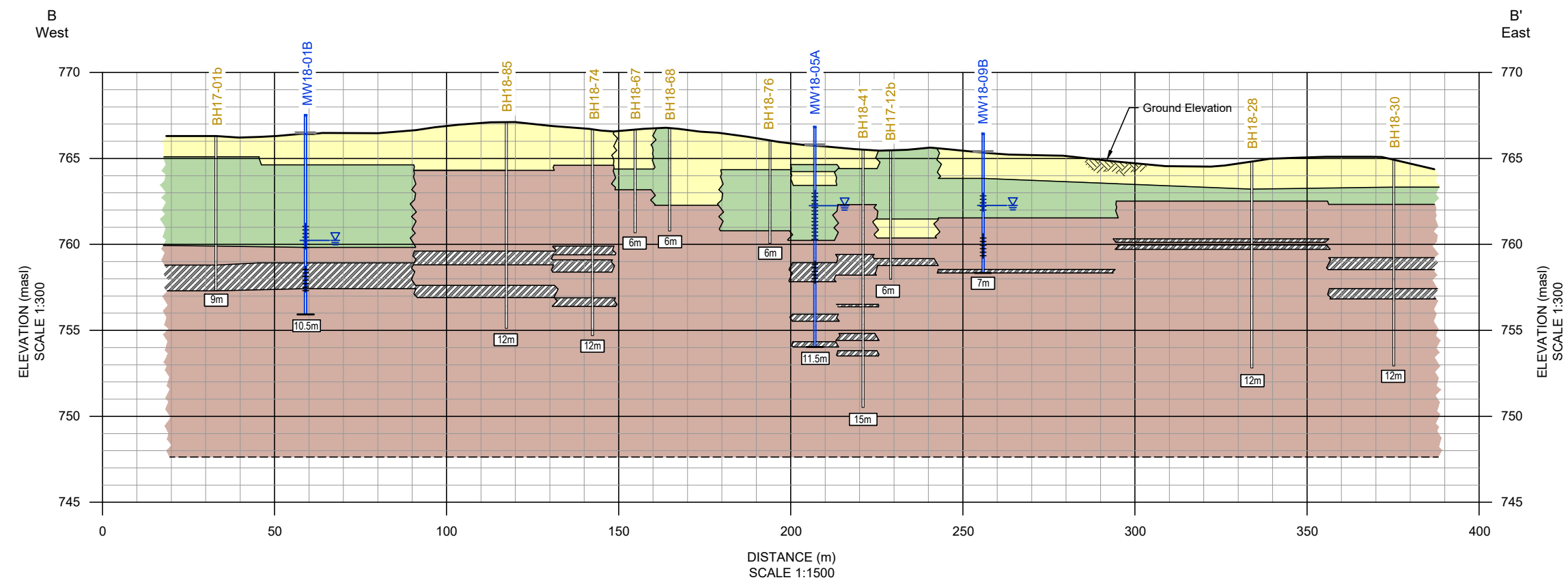
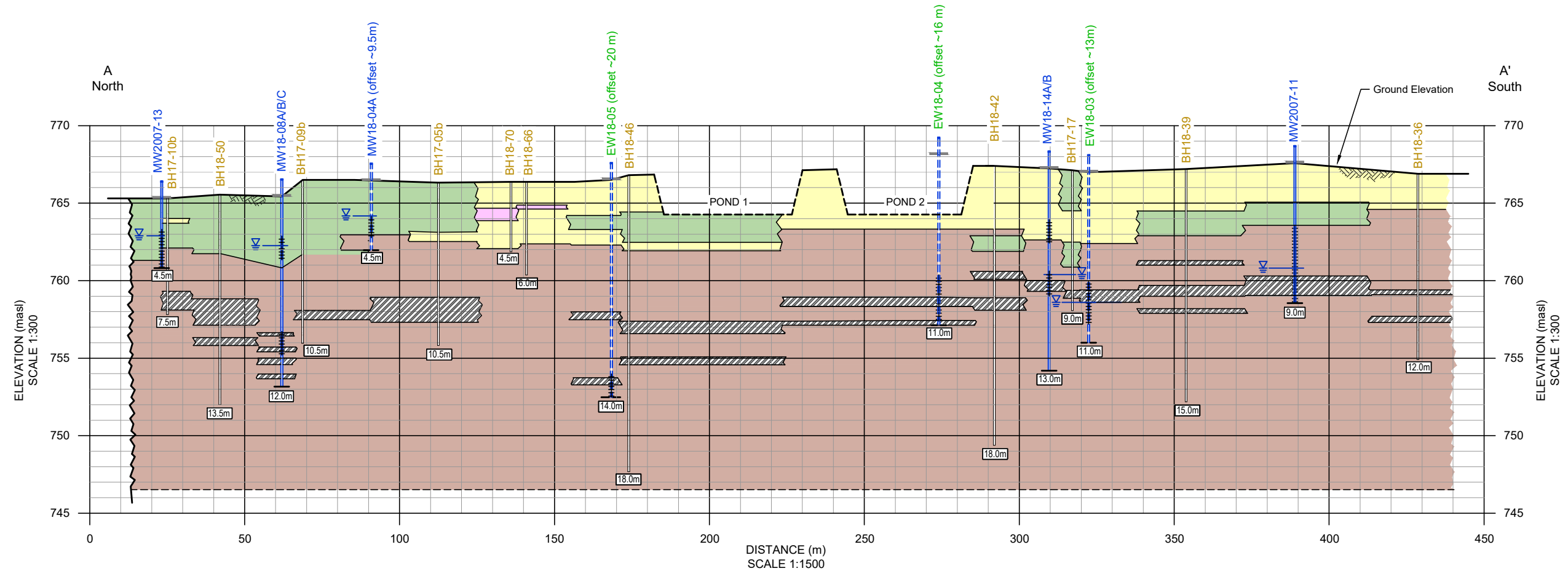
0 25 50 100m
Scale 1 : 2500

Cross-Section Locations

logo

Figure:

2

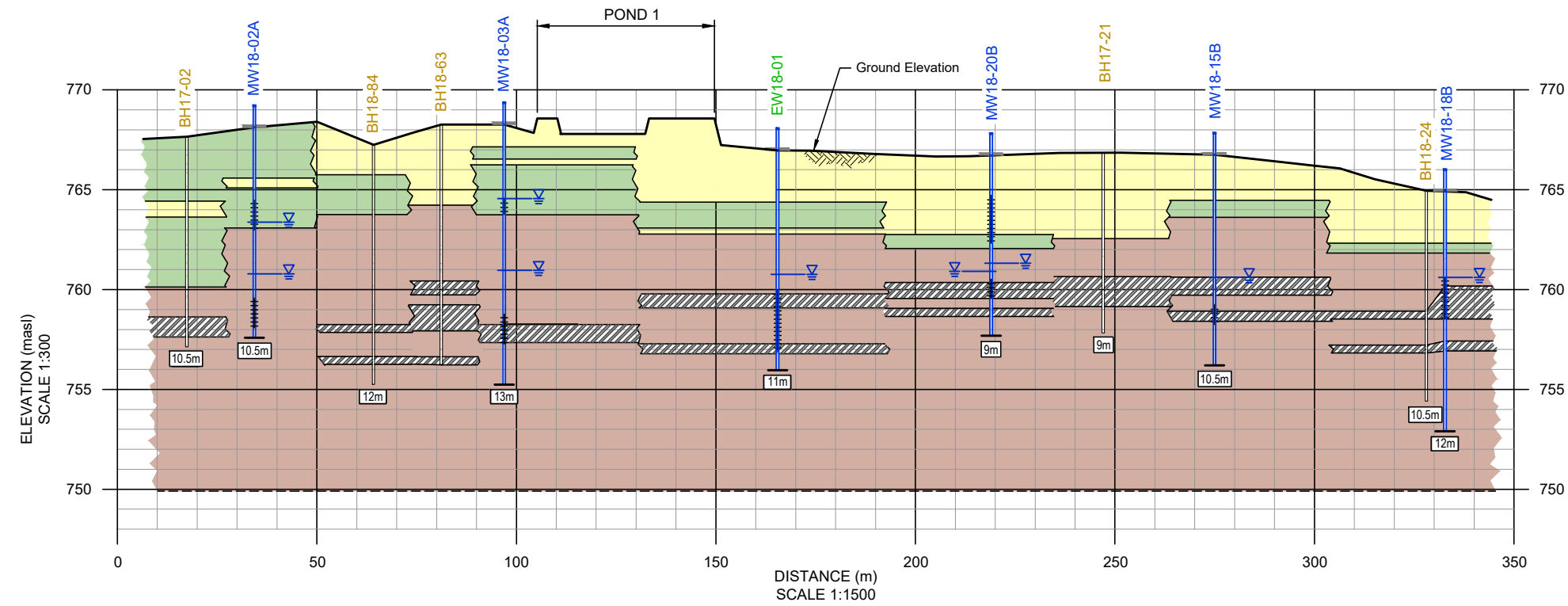


DRAWING SHOULD BE PRINTED ON 11x17 PAPER FOR ACCURATE SCALING.

Geological Cross-Sections A-A' and B-B'

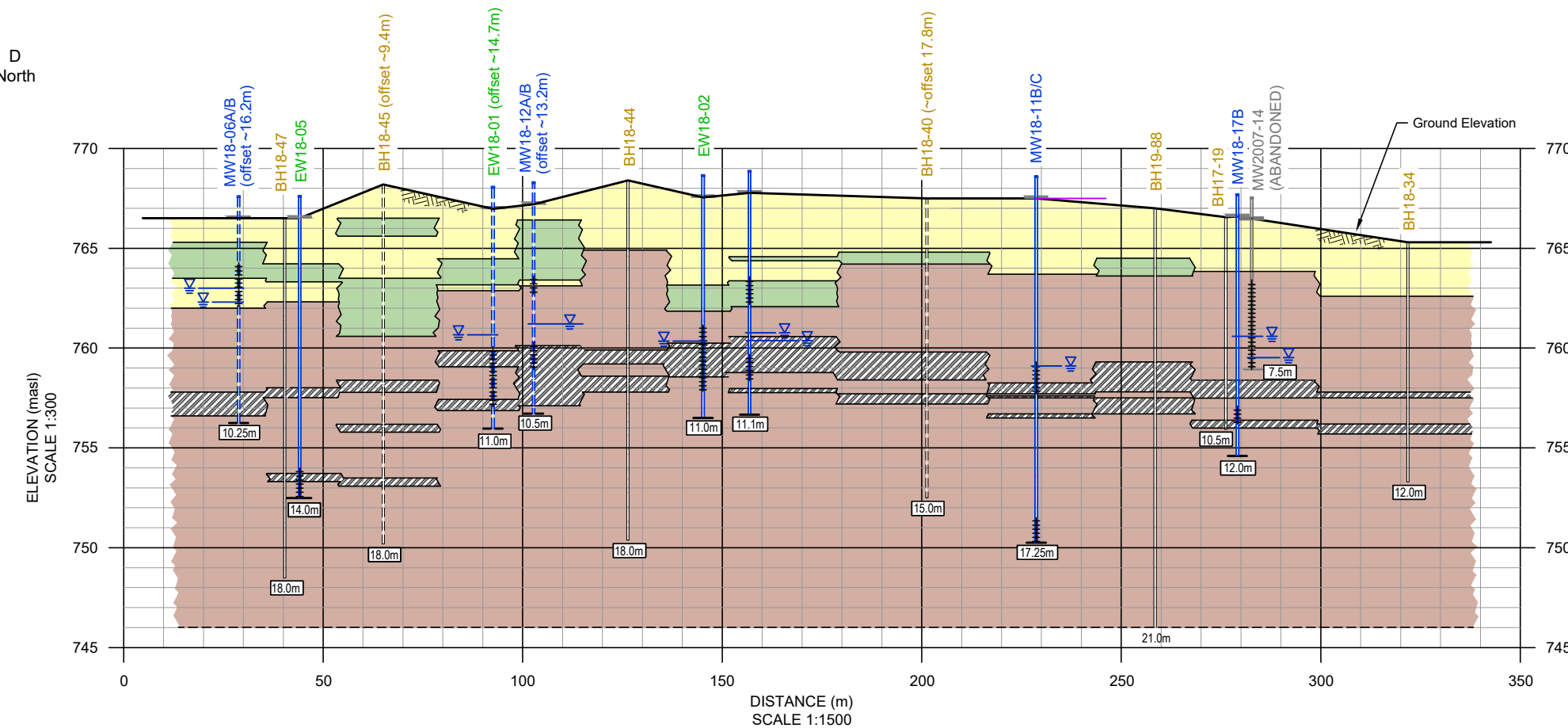
logo

C
West



C'
East

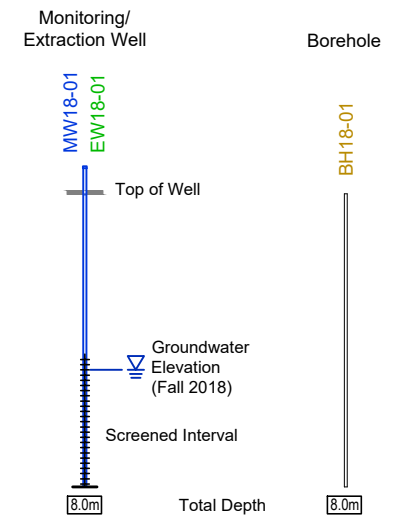
D
North



D'
South



Legend



Lithology

- Sand
- Clay
- Bedrock
- Coal

DRAWING SHOULD BE PRINTED ON 11x17 PAPER FOR ACCURATE SCALING.

Geological Cross-Sections
C-C' and D-D'

logo

Logs



CLIENT:
PROJECT #:

PROJECT: Phase II ESA
LOCATION:

BOREHOLE LOG

19BH-04/19MW-04

SUBSURFACE PROFILE			SAMPLE		FIELD SCREEN		WELL CONSTRUCTION
DEPTH (m)	TEXTURE	LITHOLOGY DESCRIPTION	INTERVAL (m)	TYPE	VOC (ppm)	EC (dS/m)	WELL COMPLETION DETAILS

0		T	Topsoil	0-0.5		0		
1			Clay: Some gravel, trace silt and sand, dark brown, moist, firm, low plastic, mottled light and dark brown, fill.	0.5-1.0		10		
2				1.0-1.5		20		
3				1.5-2.0		90		
4			4.0 m - mottled grey and black, hydrocarbon odour.	2.0-2.5		50		
5				2.5-3.0		45		
6				3.0-3.5		30		
7				3.5-4.0		60		
8				4.0-4.5	Grab	250		
9				4.5-5.0		30		
10				5.0-5.5		60		
11				5.5-6.0		40		
12				6.0-6.5		60		
13				6.5-7.0		75		
14				7.0-7.5		55		
15				7.5-8.0		60		
16				8.0-8.5	Grab			
17				8.5-9.0				
18				9.0-9.5	Grab			
19				9.5-10.0				
20								

Bentonite Chips

Sand Pack

Screen

Slough

DRILLING & COMPLETIONS	DRILLER:	SURVEY	Ground Elevation (m): N/A	Notes:
	DRILLING METHOD: Solid-stem auger		Top of Casing Elevation (m): N/A	
	BOREHOLE DIAMETER: 6"		Datum: NAD 83	
	WELL DIAMETER: 2"		Northing:	
	DRILL DATE:		Easting:	
	LOGGED BY:			

CLIENT:		Borehole ID: 18-BH08			
UWI:		DATE DRILLED:			
SURFACE LOCATION:		RATIONALE: Aboveground Storage Tank Delineation			
UTM COORDINATES (+/- 3m):		TOTAL DEPTH: 4.5 mbg			
BOREHOLE LOCATION: 21 m southwest of well centre		DEPTH TO WATER: Not observed			
DRILLING CONTRACTOR:		LOGGED BY:			
DRILLING METHOD: 6" Solid-Stem Auger		DRAFTED BY: BB			
DEPTH (metres)	LITHOLOGY Description (CSSC): Colour, moisture; grade, class, structure kind; consistency; abundance, size, contrast mottles; gleying; fragments; inclusions (precipitates, coal); calcareousness. Other (staining, odour, pad/fill vs native, roots, topsoil or till).	SAMPLES			BACKFILL MATERIAL
		Sample ID	EC (dS/m)	OVA (ppm)	

0	0-2.0 mbg SANDY CLAY LOAM (SCL): Brown, moist; moderate plasticity; moderate subangular blocky; firm; few, medium, distinct orange mottling.	18-BH08: 0.3	1.4	10	Drill Cuttings
		18-BH08: 0.6	2.2	20	
		18-BH08: 1.0	2.2	10	
1		18-BH08: 1.4	1.9	10	
		18-BH08: 2.0	0.4	5	
2	2.0-2.2 mbg SAND (S): Light brown, moist; moderate grain; trace clay; coarse inclusions.	18-BH08: 2.5	2.7	5	
	2.2-2.9 mbg SANDY CLAY (SC): Brown, moist; moderate plasticity; moderate subangular blocky; firm; coarse inclusions; few, fine, distinct orange mottling.	18-BH08: 2.9	2.2	5	
3	2.9-4.5 mbg SANDY CLAY (SC): Dark brown, moist; moderate plasticity; moderate subangular blocky; firm; coarse inclusions.	18-BH08: 3.5	2.8	0	
		18-BH08: 4.0	3.1	0	
4		18-BH08: 4.5	2.9	0	