MINISTÈRE DE LA TRANSITION ÉNERGÉTIQUE
Liberté Égalité Fraternité

TECNOAMBIENTE
A TRADEBE COMPANY

Document reference				***Issue information***	
Project	**Package**	**Issuer**	**Chrono**	**Revision**	**Status**
MED	*-*	*TEC*	*56*	*1*	*A*
Title	***MED_TEC_56_Factual report - UXO survey - OWF Zone 2 AO6 area_1***				

Additional Metadata	**Discipline**	**Document Type**	**System**	**Activity**
	GPY	*Factual report*	*-*	*UXO survey*
	Contract	**Acceptance Class**	**Dossier**	**Alternative ref.**
	AO6-AO7	*-*	*-*	*-*
	Confidentiality	**Print format**	**Subcontractor**	**Contractor ref.**
	Restricted	*A4*	*-*	*-*

Date	Rev	Status	Reason for revision	Issued by	Checked by	Approved by
14/07/2023	*0*	*IFR*	*Issued*	*BMC*	*MH*	*FLM*
22/12/2023	*1*	*B*	*Revision after client's comments*	*BMC*	*MH*	*FLM*
10/01/2024	*1*	*A*	*Approved*	*BMC*	*MH*	*FLM*

Change Log

TECNOAMBIENTE
A TRADEBE COMPANY

MINISTÈRE
DE LA TRANSITION
ÉNERGÉTIQUE
Liberté
Égalité
Fraternité

MED_AO6 AREA – OWF ZONE 2
UXO SURVEY

MED_TEC_56_FACTUAL REPORT - UXO SURVEY - OWF ZONE 2 AO6 AREA_1

PROJECT No.
113401341

FACTUAL REPORT

No. OF PAGES
68

1	*10/01/2024*	*Approved*	*BMC*	*MH*	*JW*	*FLM*	*DGEC*
1	*22/12/2023*	*Revision after client's comments*	*BMC*	*MH*	*JW*	*FLM*	*DGEC*
0	*14/07/2023*	*Issued*	*BMC*	*MH*	*FLM*	*CPC*	*DGEC*
REV	***DATE***	***DESCRIPTION***	***BY***	***CHK***	***ENG***	***PM***	***CLIENT***

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

ADCP	Acoustic Doppler Current Profiler
Ch	Channel
cm	Centimetre
CMP	Common Mid-Point
C-O	Computed Minus Observed
CoG	Centre of Gravity
CRP	Central Reference Point
DEMOB	Demobilisation
DGEC	Direction générale de l'énergie et du climat
DP	Dynamic Positioning
DPO	Dynamic Positioning Officer
DPR	Daily production report
EP	Environmental Protection
FLO	Fisheries Liaison Officer
GNSS	Global Navigation Satellite System

ABBREVIATIONS

GPS	Global Positioning System
GRS	Geodetic Reference System
GSO	Geophysical Services Offshore
h	Hour
IMO	International Maritime Organization
J	Joule
JNCC	Joint Nature Conservation Committee
kHz	Kilohertz
LAT	Low Astronomical Tide
m	Meters
min	Minutes
MBES	Multibeam echosounder
mm	Millimetre
MOB	Mobilisation
MRU	Motion Reference Unit
MBES	Multibeam Echosounder System
POB	Personnel On Board
PAM	Passive Acoustic Monitoring
PPP	Precise Point Positioning
PPSU	Pulse Power Supply Unit
QA-QC	Quality Assurance – Quality Control
RTE	Réseau de Transport d'Électricité
RTK	Real Time Kinematics
s	Second
SHOM	Service Hydrographique et Océanographique de la Marine
SN	Serial Number
SRF	Ship's Reference Frame
SBP	Sub-Bottom Profiler
SVP	Sound Velocity Profiler
SVS	Sound Velocity Sensor
SSS	Side Scan Sonar
TBC	To be confirmed
TTS	TTSurvey Ltd (Seismic equipment hire company)

ABBREVIATIONS

UHR	Ultra-High Resolution
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
VSAT	Very-Small-Aperture Terminal
WB	Water Bottom
WD	Water Depth
WGS84	World Geodetic System 1984
WT	Work time
ZH	Hydrographic Zero or Hydrographic Datum

1. INTRODUCTION

This report together with the supporting appendix, describes the results of the UXO survey conducted by Tecnoambiente with the S/V Geo Focus in the Zone 2 offshore windfarm area (OWF) at MED_AO6 area (Mediterranean). Both the survey vessel and the equipment used for this task have been shared with the rest of offshore windfarm areas (Zones 1, 2, 3 and 4 OWF) and the Offshore Substation areas (Zone 1, 2 and 3 OSS).

The objective of the site survey was to perform an UXO survey over the proposed UXO GI points (Borehole locations) over the area of interest, comprising MBES, SSS and SBP datasets.

The purpose of this survey was to:

- To define the final location of the GI points on the proposed box
- To detect MBES, SSS and SBP contacts
- To review proposed borehole locations for geohazards

The main objective of this was to provide the ALARP certificates necessary for a subsequent geotechnical investigation to be conducted within the zone. The survey proved to be a success and all objectives were met as detailed herein.

2. SCOPE OF WORK

2.1. SURVEY AREA

The areas of interest are located in the Gulf of Lion off the French Mediterranean coast. These areas are 4 offshore windfarm (Zone 1 OWF, Zone 2 OWF, Zone 3 OWF and Zone 4 OWF) and 3 offshore substations (Zone 1 OSS, Zone 2 OSS and Zone 3 OSS) which are under investigation in this project (Figure 2-1).

The area of relevance in this report is Zone 2, located off the coast of Marseille. This survey area is divided in two sites (Figure 2-2):

- Offshore Substation (OSS) (3.97 km^2)
  - *Dimensions: 0.96 km x 4.10 km*
  - *Bathymetric range: -88 m to -96 m (Vertical reference Bathyelli v2 ZH)*

- **Windfarm area (OWF) (311.73 km^2)**
  - ***Dimensions:* 18.95 km x 24.50 km.**
  - ***Bathymetric range:* -71 m to -128 m (Vertical reference Bathyelli v2 ZH)**

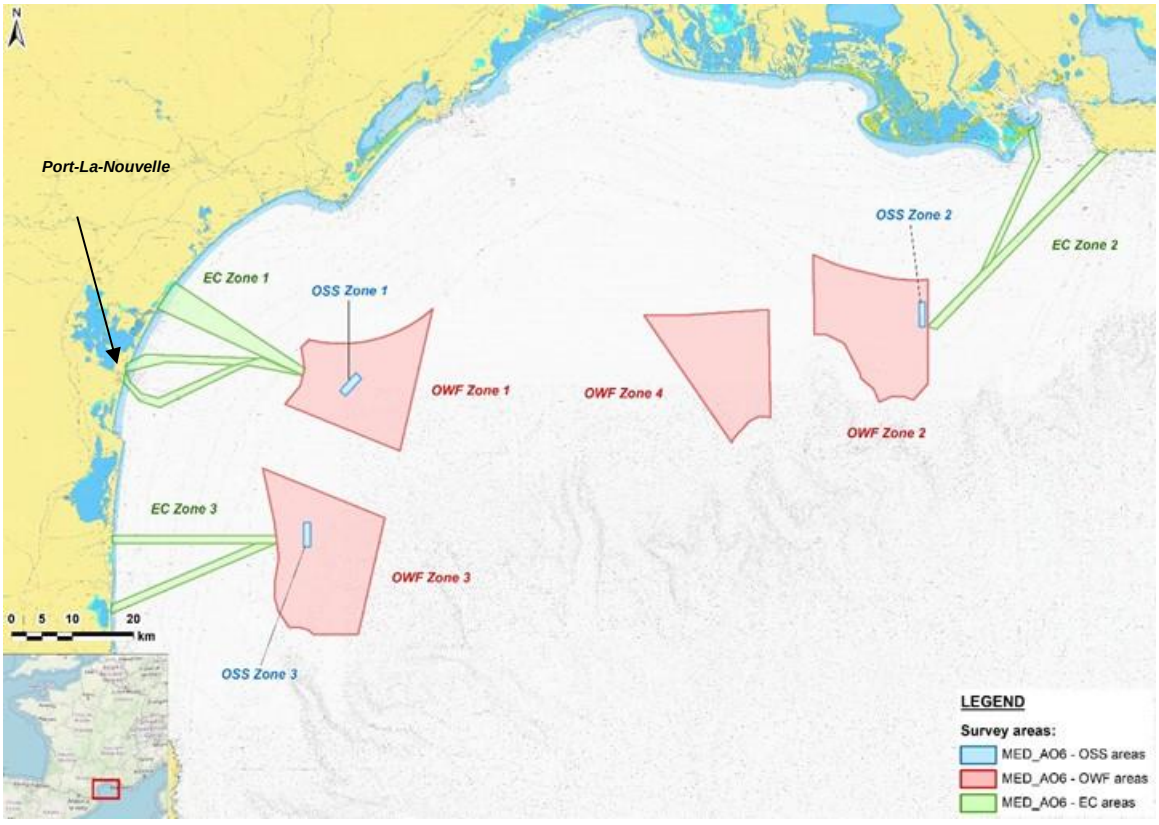


Figure 2-1: MED_AO6 survey area.

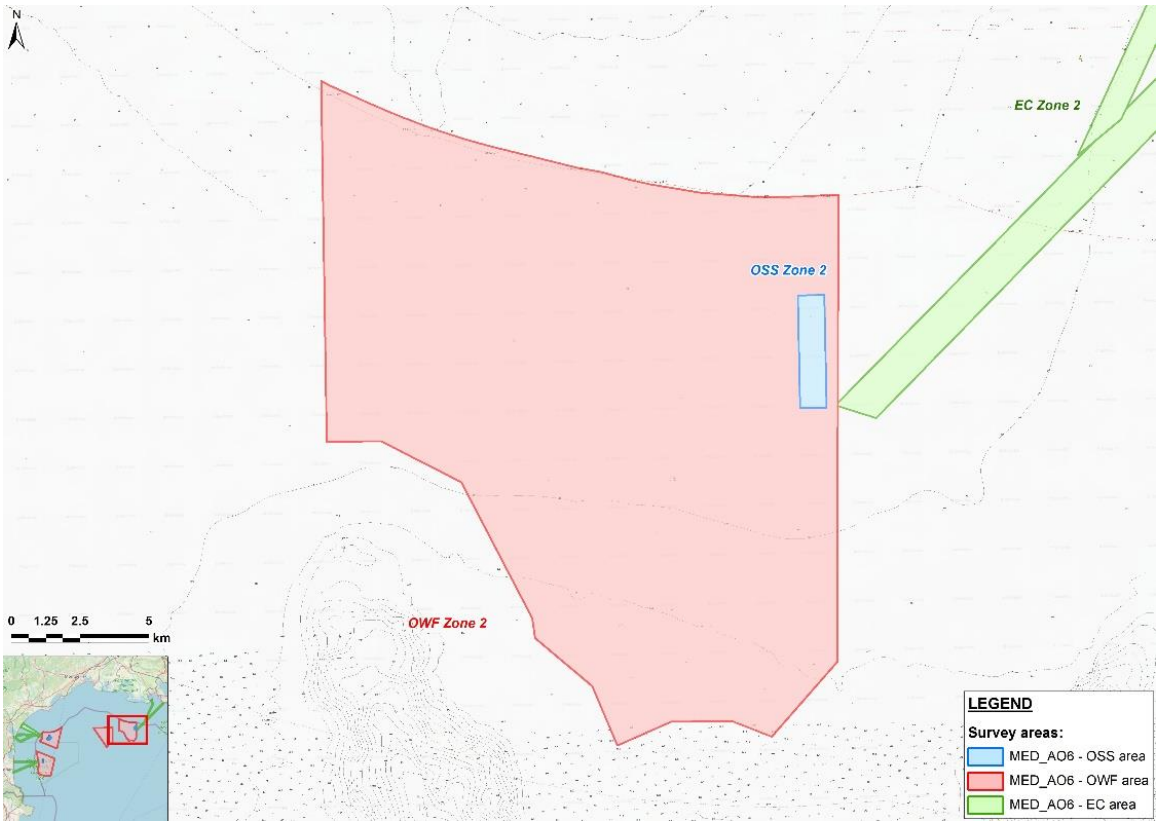


Figure 2-2: Windfarm area (OWF) and Offshore Substation (OSS) in the MED_AO6 Zone 2 Survey area.

2.2. SURVEY PLAN

The AO6 Zone 2 OWF contains 20 base UXO boxes and 8 alternative boxes. A lineplan of 3 lines with 30 meters spacing was performed to acquire the required geophysical data on each UXO box.

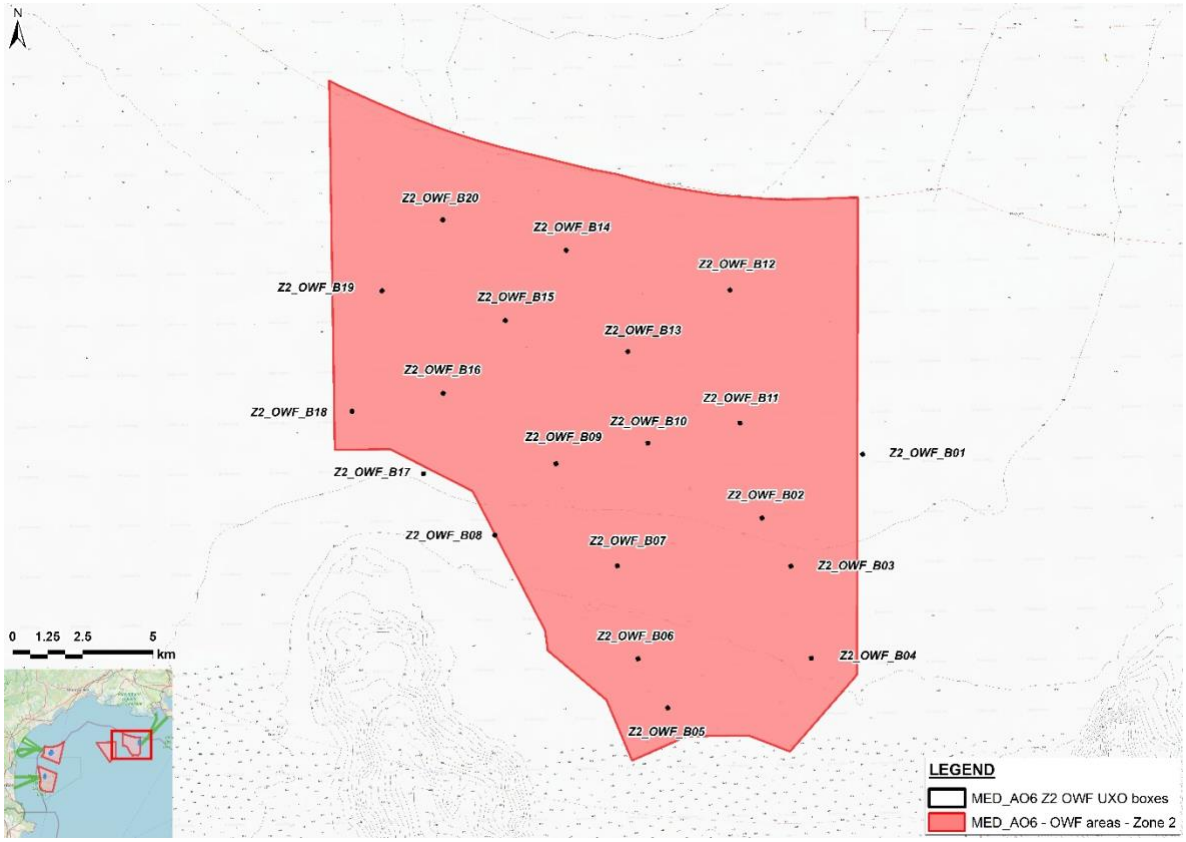


Figure 2-3: MED_AO6 Zone 2 OWF UXO boxes locations.

Each of the UXO boxes comprises an area of approximately 30m x 30m, with a run in / run out length of 400 metres utilised to optimise the acquisition of the geophysical data.

Figure 2-4 provides an example of the UXO survey boxes and Figure 2-5 illustrates the survey line plan for the different UXO risk locations (Please refer to section 2.4).

Figure 2-6 shows the general lineplan for UXO boxes at the survey area.

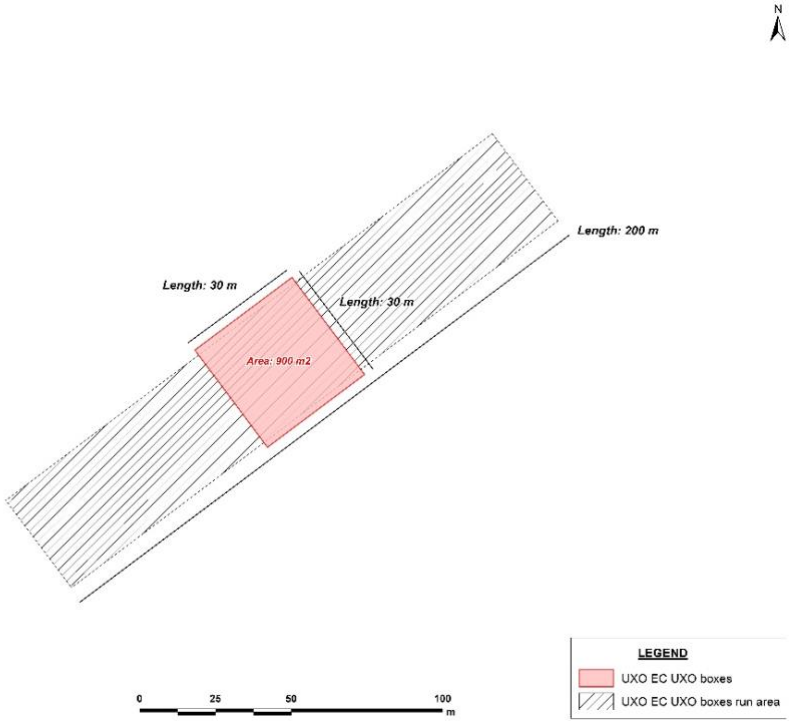


Figure 2-4: Example of UXO boxes dimensions.

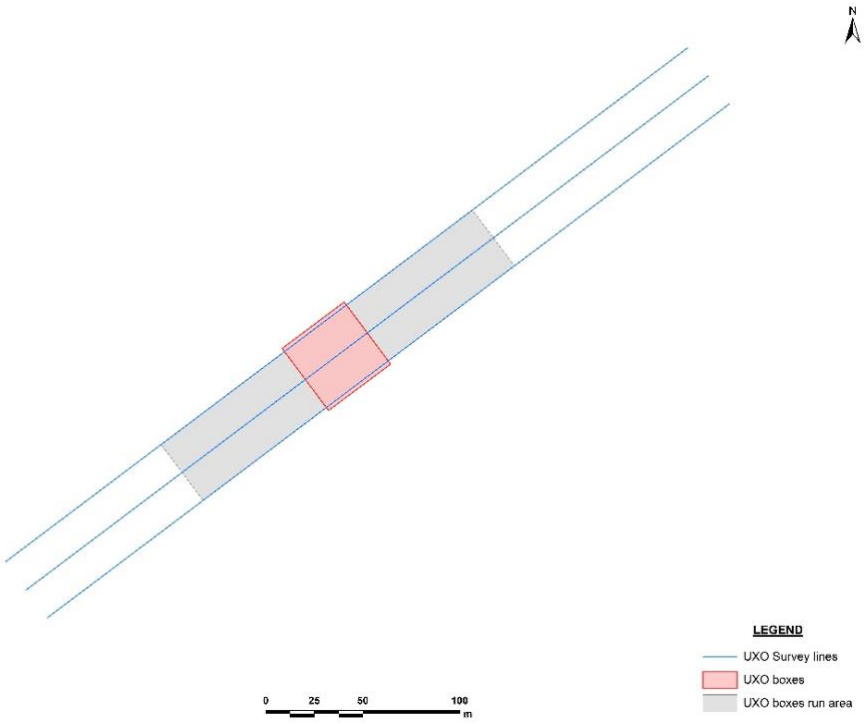


Figure 2-5: Example of UXO boxes survey line plan for the UXO Low and Medium risk locations.

Table 1: Summary for the number of UXO boxes in the MED_AO6 OWF Z2 area.

SUMMARY OF NUMBER OF UXO BOXES ON SITE		
Operation	**Unit**	**#**
MED_AO6 OWF Z2 GI Locations (UXO boxes)	*No*	20
TOTAL	***No***	**20**

Table 2: Summary for the survey line plan of the UXO boxes in the MED_AO6 OWF Z2 area.

SUMMARY OF LINEPLAN FOR THE UXO BOXES ON SITE		
Operation	**Unit**	**Length**
MED_AO6 OWF Z2 GI Locations (UXO boxes)	*km*	39.6
TOTAL	***km***	**39.6**

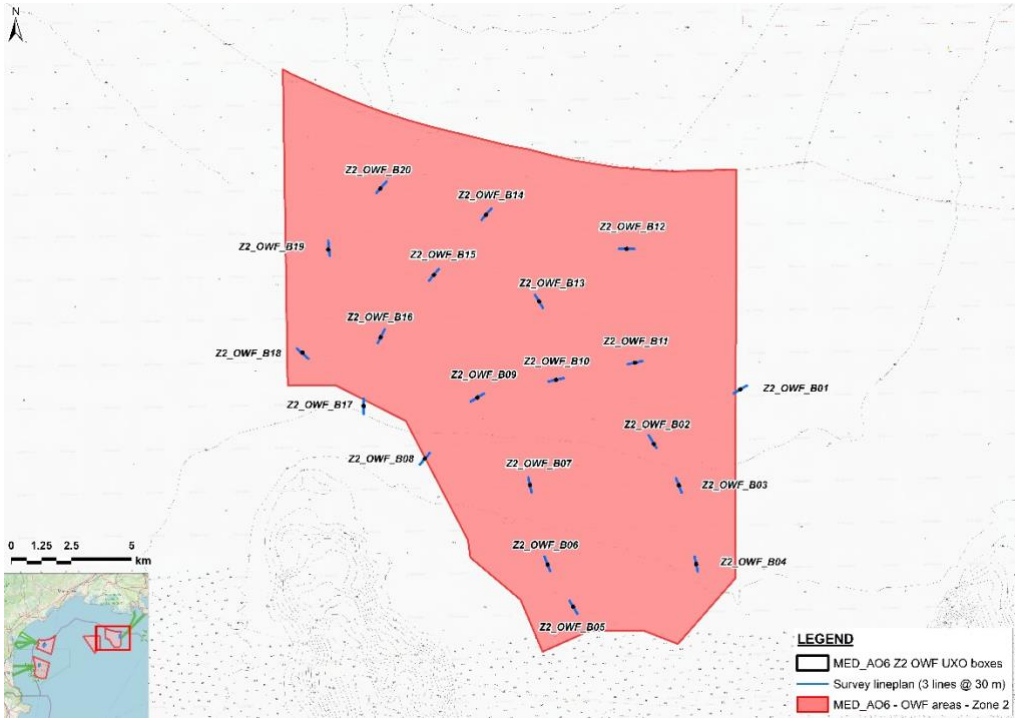


Figure 2-6: MED_AO6 Zone 2 OWF UXO survey plan.

2.3. UXO RISK ANALYSIS

During the survey planning of this project, 6-Alpha associates conducted a risk analysis of the presence of UXO elements in the MED_AO6 work area. The "Unexploded Ordnance Threat and Risk Assessment" document detailed a zonation of the work zone into three categories: Low, Medium and High risk. This zonation is presented in the figure below.

As agreed with the client, based on the risk presented by 6-Alpha in its study, it was established that:

- In areas whose UXO risk is Low or Medium, data acquisition for UXO detection would be performed with MBES, SSS and SBP.
- In areas with High UXO risk, data acquisition for UXO detection would be performed with MBES, SSS and MAG.

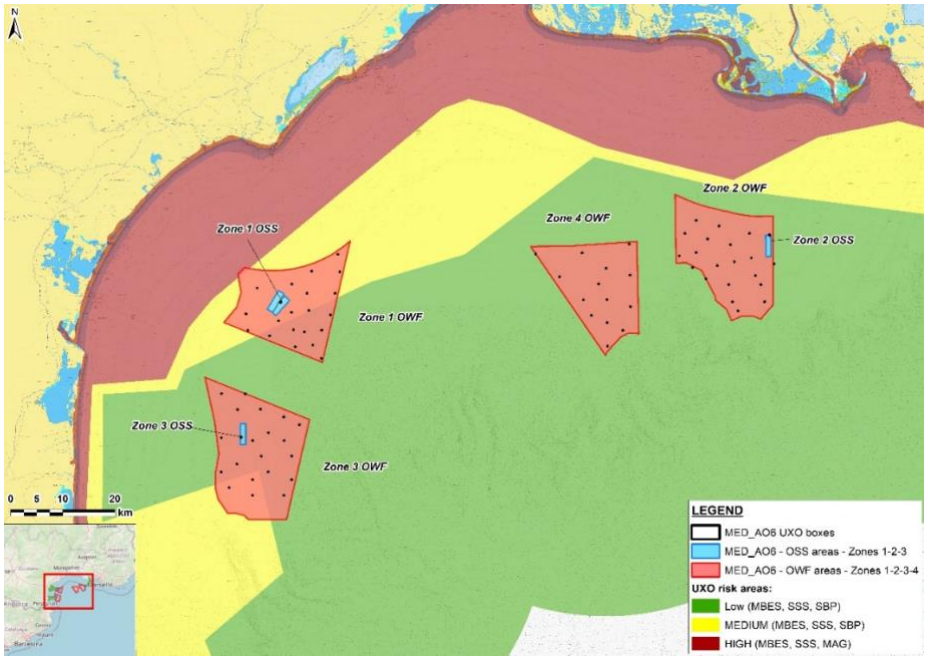


Figure 2-7: UXO risk analysis for the MED_AO6 OWF and OSS survey areas.

It is observed in the zonation that the working areas of the OWF Z1-Z2-Z3-Z4 and OSS Z1-Z2-Z3 are located in low and medium UXO risk areas.

3. SURVEY CONTROL

3.1. GEODETIC PARAMETERS

3.1.1. Survey datum

These parameters are detailed below.

Table 3: Datum parameters table

DATUM	
Survey Datum:	WGS 84
Spheroid	GRS 1980
Semi-Major Axis (a)	6378137.000000000
Semi-Minor Axis (b)	6356752.314245179
Inverse Flattening (1/f)	1/298.257223563

Table 4: Projection parameters table.

PROJECTION	
Projection	UTM
False Easting	500000
False Northing	0
Latitude of Origin	0º00’00.000000”
Central Meridian	3º00’00.000000”
UTM Zone	31 N
Scale Factor on CM	0.9996
Units:	Meters

3.1.2. Vertical datum

The vertical datum used in the QINSy software is Bathyelli v2.0 ZH geoid published by the SHOM in December 2018. The Bathyelli v2.0 ZH (SHOM 2018) is a surface based on the GRS 1980 spheroid, and it is a set of surfaces each of which defines the separation of one vertical datum from the WGS84 ellipsoid to the vertical maritime reference Hydrographic Datum or Hydrographic Zero. These ellipsoidal heights are given in meters.

This geoid covers the intersection between the SHOM tidal model and the different tidal zones of France.

For the survey area MED_AO6 Z2, the corrections to hydrographic zero are made by tidal observations of the port of Marseille (Corniche) (43º16’ N – 05º 21’ E). For informative purposes, the difference between the hydrographic zero and the LAT reference level for this port is 0.27 m, according to the study by SHOM "*Références Altimétriques Maritimes. Ports de France métropolitaine et d'outre-mer"* of 2019.

3.1.3. Tidal reduction

To carry out the survey as accurately as possible, Tecnoambiente is receiving MarineStar PPP corrections by satellite signal. When using an accurate GNSS system, the tidal corrections are carried out in real-time through QINSy computations, as it is shown in the following figure.

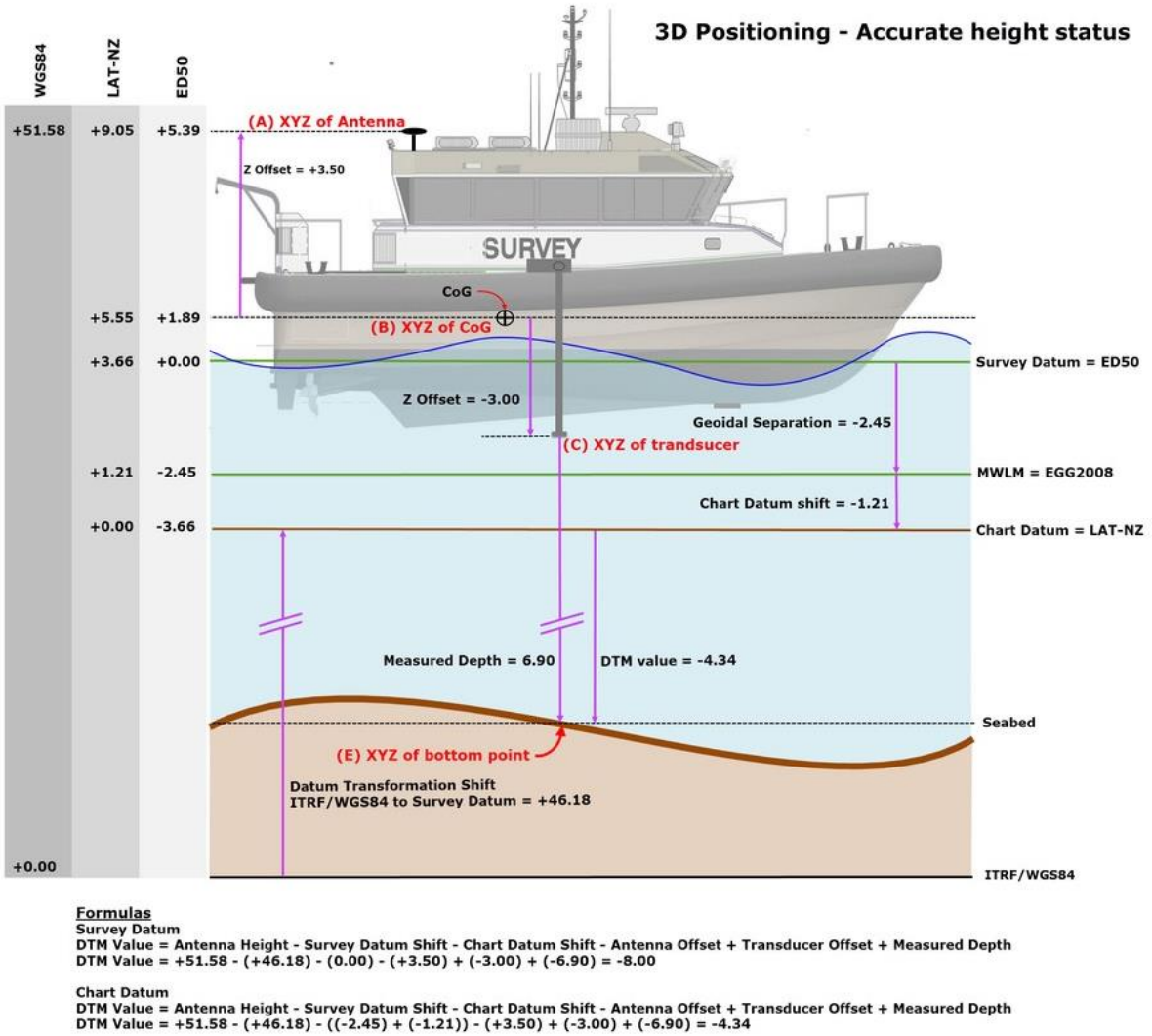


Figure 3-1: QINSy's method for accurate tide calculation.

In the event that corrections drop out they can be applied in post processing.

4. QA/QC CHECK

The processed values obtained from the onboard processing team during the survey were checked before the ALARP certificate phase. This quality control check of the input data validated the quality of the processing method.

Below are presented the QA/QC checks made for the measurements:

- QC0: Check of the geophysical value
- QC1: Check of the sensor position
- QC2: Check of the altitude of sensor and dynamic coverage
- QC3: Check of the noise
- QC4: Check of the speed and sampling frequency

5. METHODOLOGY

5.1. MBES BATHYMETRY

5.1.1. Data acquisition

The main objective of the MBES data acquisition is to identify pUXO in the ALARP box areas and buffer zones, therefore, the total coverage of the study area was not necessary. Due to this the project lines have been designed with a spacing of 30 meters.

During the data acquisition, the vessel's master must follow the previously programmed routes of the project lines, governed by the indications of the computer screen (Helmsmann indicator), which is shown, by means of visual and audible alarms, when it separates from its course more than a specified amount (variable according to weather conditions in the area, but never more than 2.5 metres from the theoretical line), and also when there is a problem in a peripheral, such as the loss of GPS corrections.

While the master follows the navigation lines, the acquisition module of the hydrography program captures all the position data sent by the GPS, as well as the soundings sent by the multibeam sounder for each transmission pulse, as well as the values of the heading, wave height, roll and head angles sent by the MRU.

Parallel to the data entry, the data acquired by the equipment and peripherals is synchronized. This process is carried out by QINSy itself, complemented by the input of the time and the pulse per second (PPS) provided by the MRU, so that all the data is time synchronised.

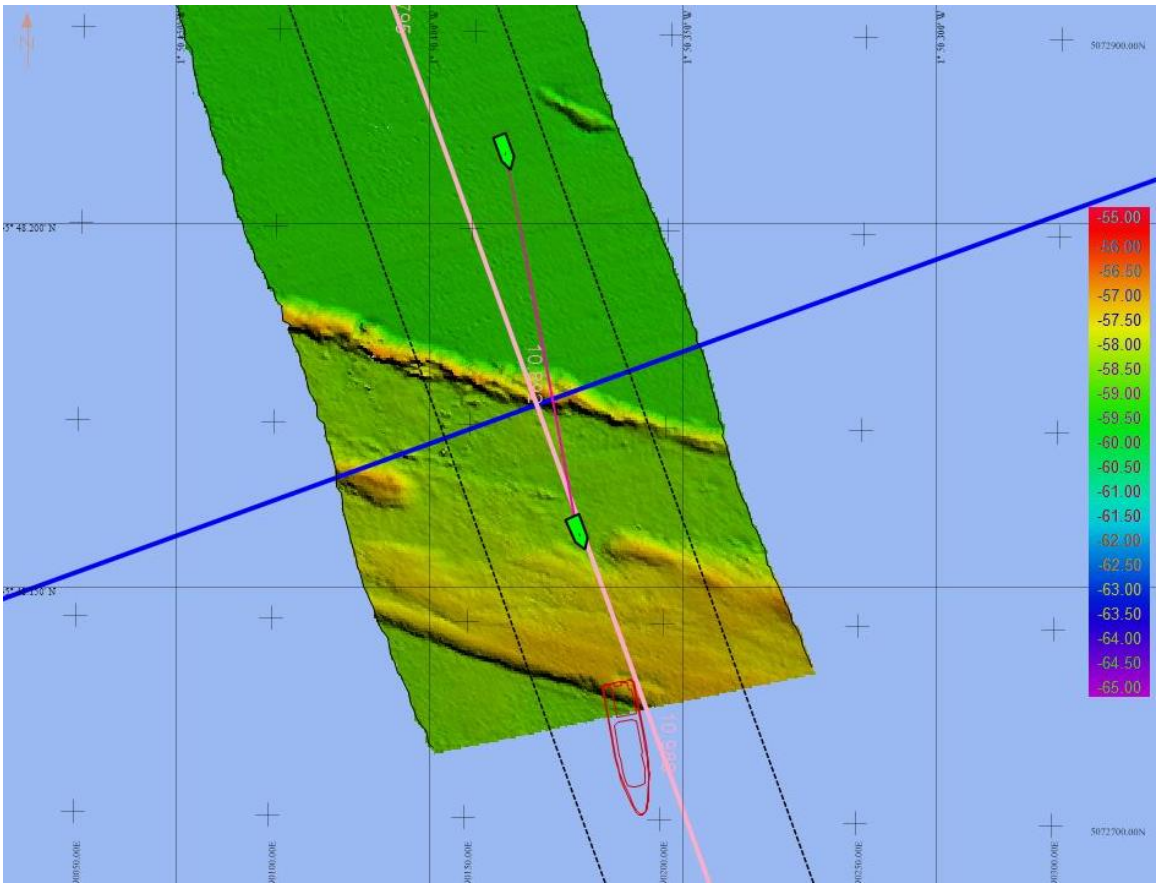


Figure 5-1: MBES bathymetry data acquisition with the QINSy software.

5.1.2. Data processing

A single head Kongsberg EM 2040 high resolution MBES system that is permanently installed on the Geo Focus vessel was used to produce digital terrain models (DTMs).

Along the processing phase of the acquired data, the lines on the screen are processed in order to manually match the height of the bathymetric lines and also correct the noise that appears in the records, noise produced by multiple factors such as, multipath in position, air bubbles, motor interference of the vessel etc. in the digital register of soundings.

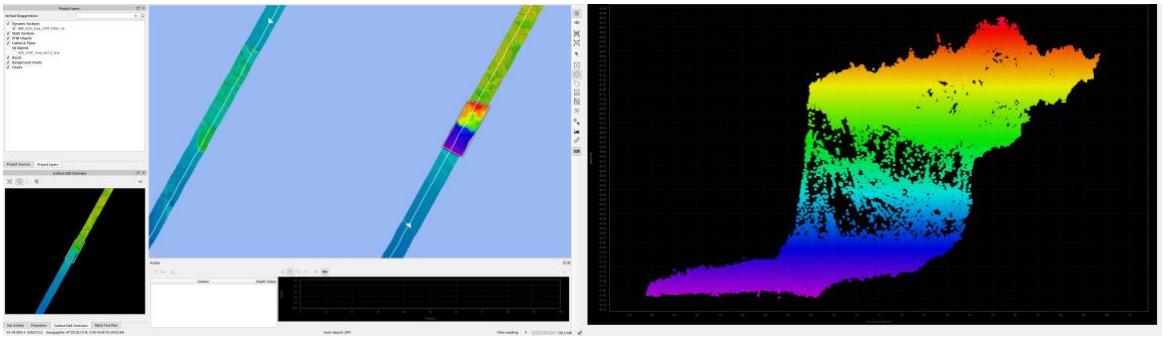


Figure 5-2: Processing screen of MBES bathymetry data with the Qimera software.

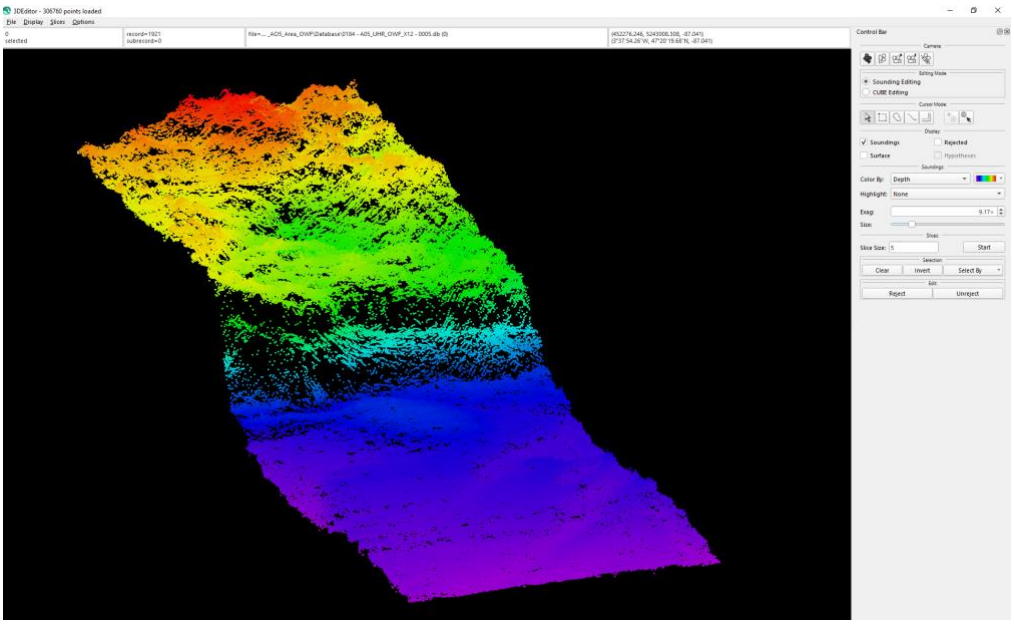


Figure 5-3: 3D image of the MBES bathymetry processing.

Once the possible existing errors in the records have been deleted, a digital model of the terrain with 0.5 x 0.5 m grid size has been made with a minimum cell size to obtain the maximum resolution of the background.

The general MBES processing workflow is presented in the following figure.

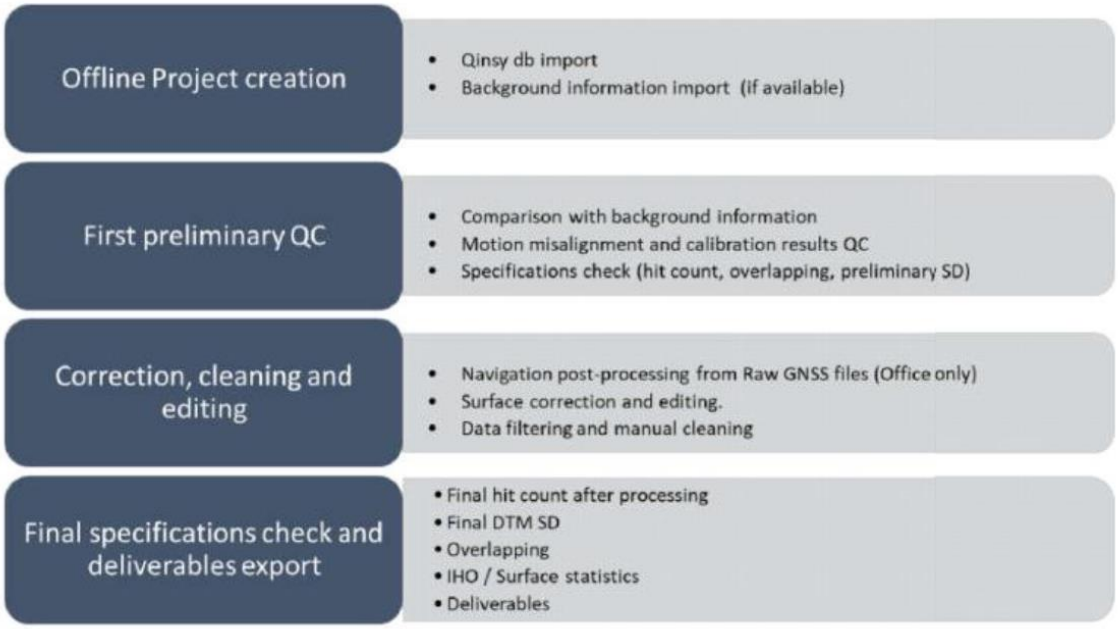


Figure 5-4: MBES bathymetry processing overview.

5.1.3. Target picking

The target picking was done using a GIS platform to detect and digitize the contacts present over the seabed surface.

5.2. SIDE SCAN SONAR

5.2.1. Data acquisition

The objective of this phase of data acquisition is the detection of possible sonar targets lying on the seabed. Due to the total coverage requirements of the seabed within each of the UXO boxes, a survey line spacing of 40 metres was utilised.

A side scan sonar system comprises a processing unit connected through a cable to a wet unit that transmits and receives acoustic energy. Side scan sonar can determine seabed morphology and configuration by means of acoustic signals. It can also determine its composition, identifying different seabed strata as hard (rocky or consolidated), soft or sedimentary, as well as identifying areas of seagrass.

Side scan sonar systems can work in different frequency ranges: systems working in high frequencies, (between 500 kHz and 900kHz) offer higher resolution but lower ranges, with systems working in low frequencies (100 kHz), offer lower resolution but higher ranges. For this survey, a frequency of 900KHz was utilised. The reflection of the signal coming from the seabed is detected by the same transducers, amplified and transmitted to the control unit, and recorded and displayed on the computer screen, providing an acoustic map. With this data, it is possible to identify different seabed morphologies, together with the visualization of any seabed objects.

When the vessel is underway, the winch operator can start deploying cable until the fish gets to the desired working depth of about 6 m above the seabed.

5.2.2. Data processing

Once the SSS data were acquired and then exported into JSF format, the files are imported into the SonarWiz 7 software. Channels 3 and 4 were used for recording the high frequency data.

After data importation into the SonarWiz 7 software, an initial navigation correction was made for each imported file, applying smoothing filters to avoid errors in the heading of the tow fish. The track position was smoothed using a mean value of 300 pings.

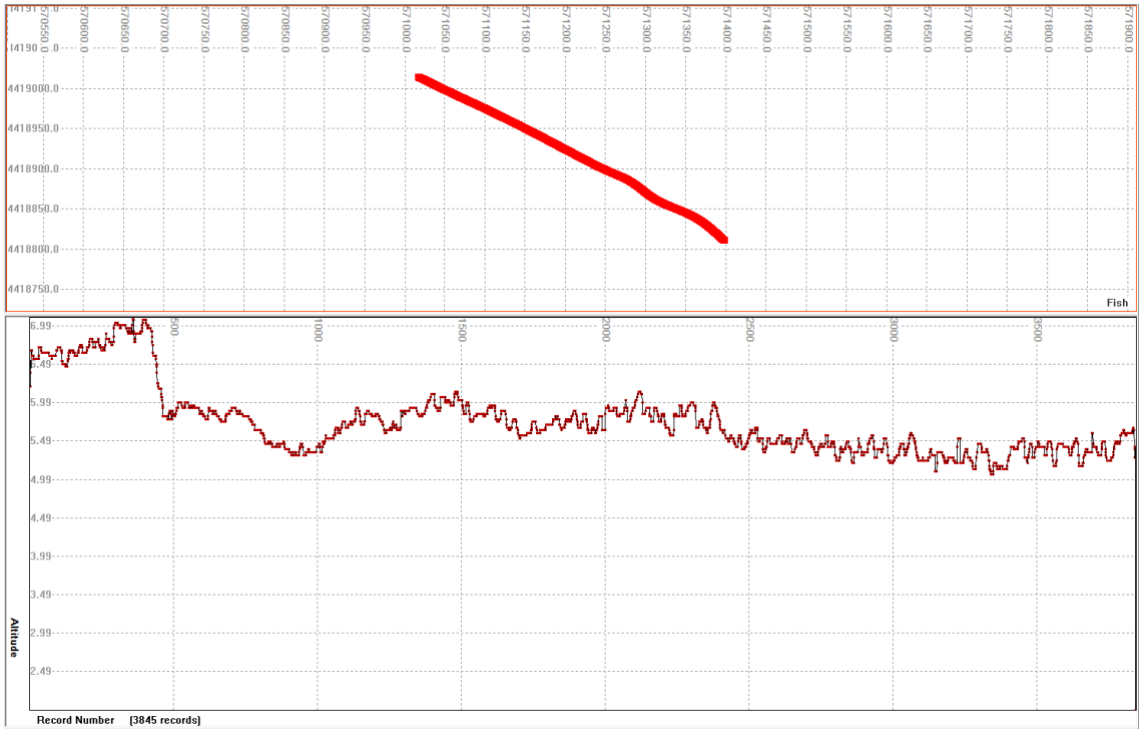


Figure 5-5: Navigation editor in SonarWiz 7.

After the aforementioned corrections were implemented, the water column for each file was eliminated, by applying the bottom-tracking acquired during the survey, as shown in Figure 5-6. If bottom-tracking of the tow fish failed during the survey, it was done automatically by applying filters or by drawing the seabed manually during post-processing. This enables slant range corrections for the digital data to be as accurate as possible.

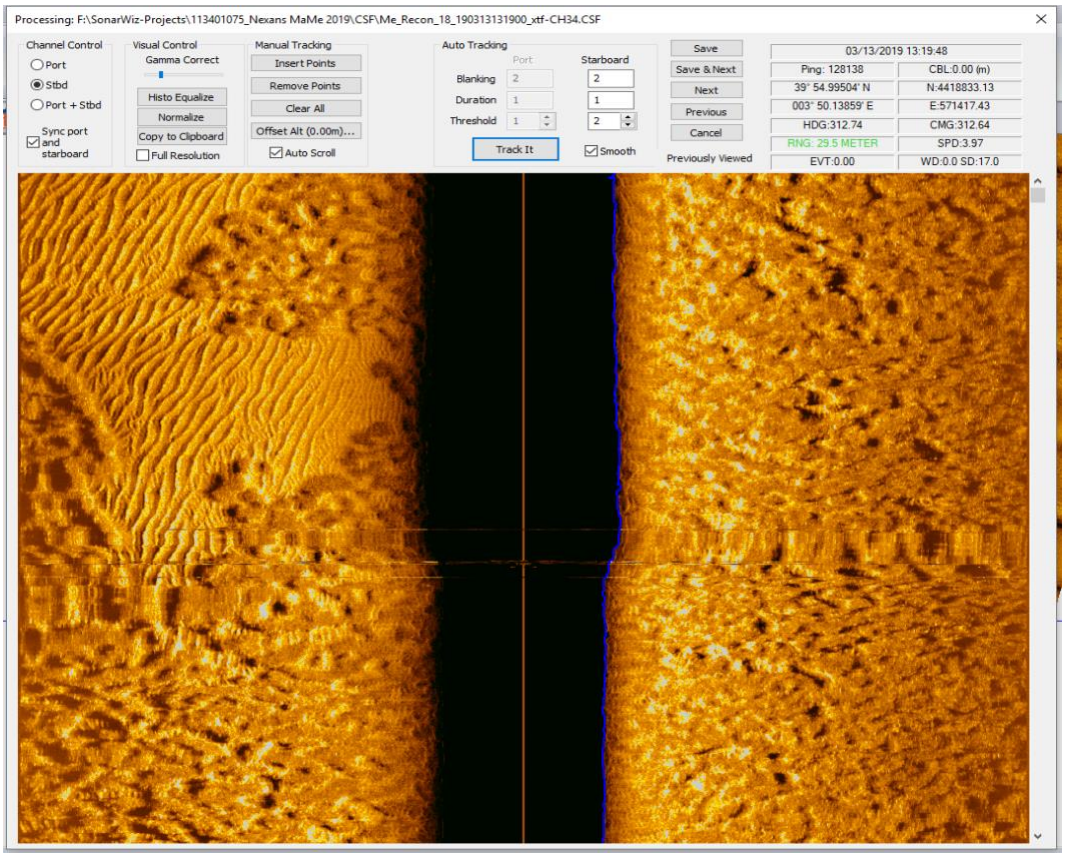


Figure 5-6: Bottom tracking processing drawn in blue in the SonarWiz software.

The following steps during SSS processing in the SonarWiz 7 software are the application and enabling of the EGN filter, and the enabling of the de-stripe filter.

At this point during data processing, a processed MBES geotiff is imported into the project. Using the MBES information, rotations to the SSS file are applied, in order to match feature orientations seen in the MBES data. Where necessary, a move offset can be applied to the SSS file, in order to match features within the MBES data.

The final processing step is the export of the sonar files into a GIS software package, where all of the information is integrated and a sonar mosaic is generated. This is carried out by converting the JSF files into 32bits RGB Geotiff images, to obtain georeferenced images of the processed data, with a resolution of 0.1 m.

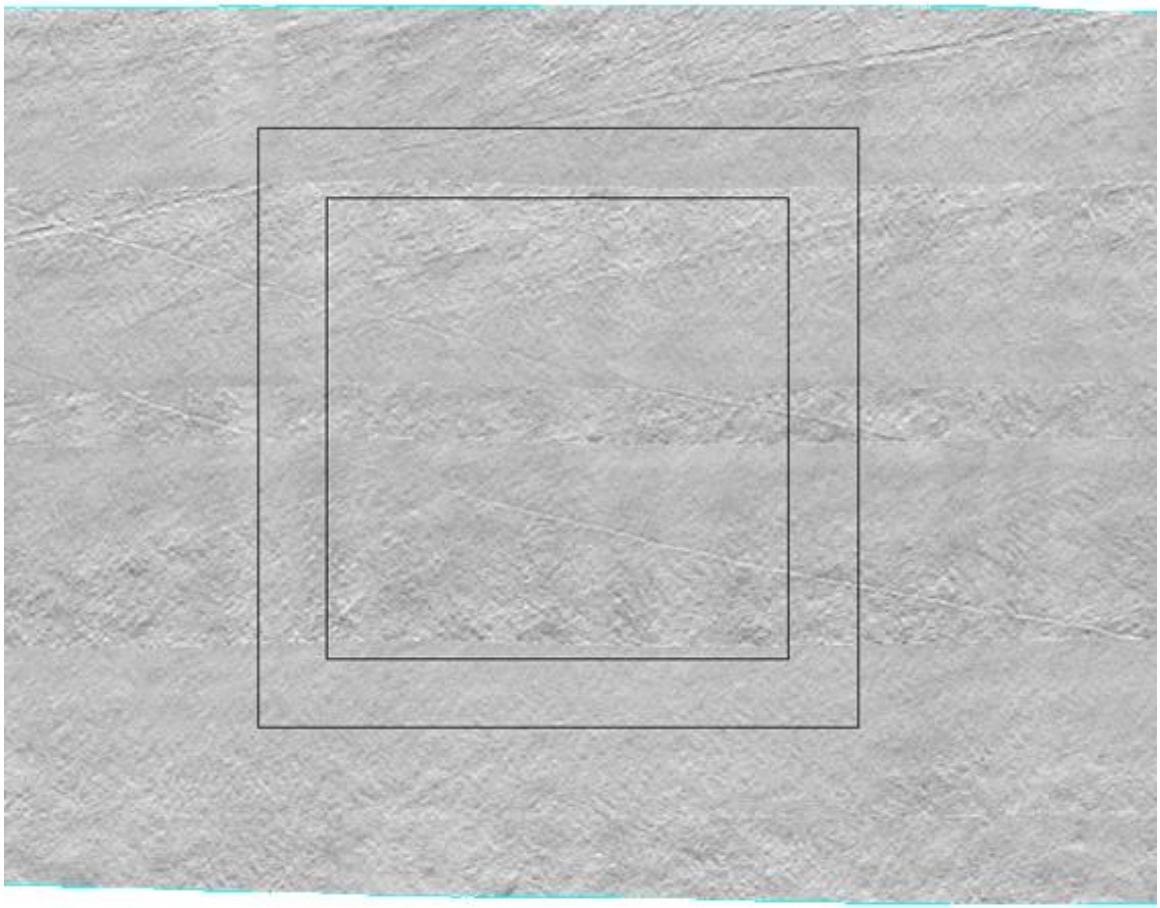


Figure 5-7: Example of an UXO box 32bits RGB SSS Mosaic with a resolution of 0.1 m.

5.2.3. Target picking

The picking of the targets was carried out on the sonograms with the “Digitizing View” tool.

When an object is detected, it is targeted, and its width and length is directly measured. The height is calculated based on the shadow on the sonogram. These measurements are performed on the processing software (SonarWiz).

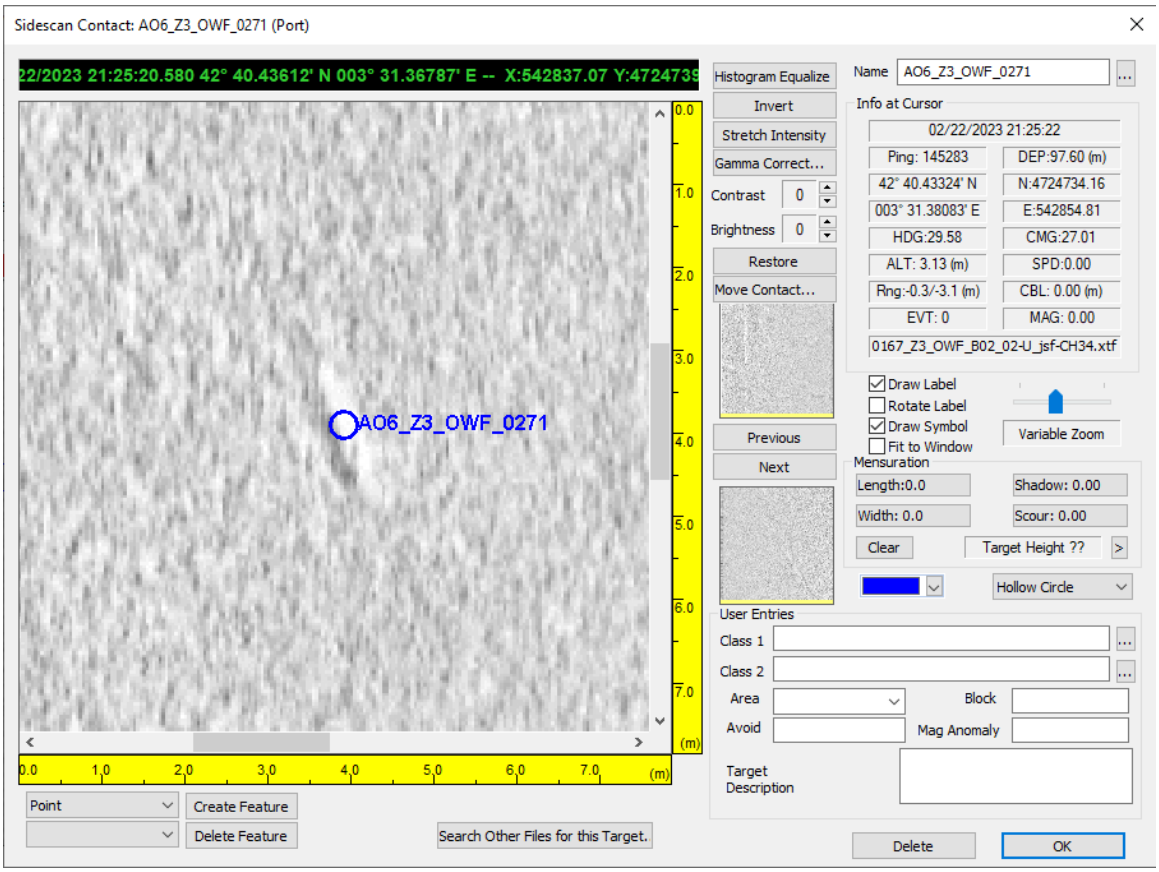


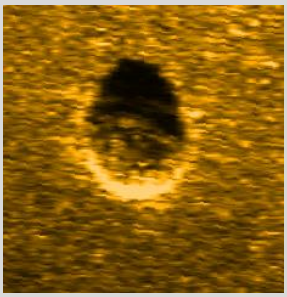
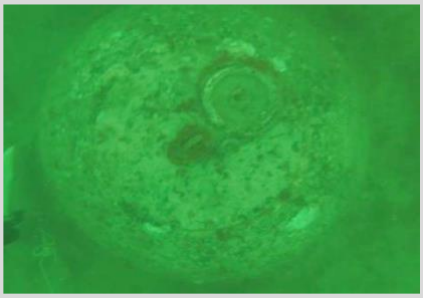
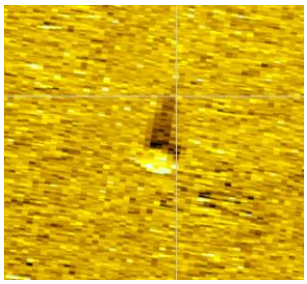
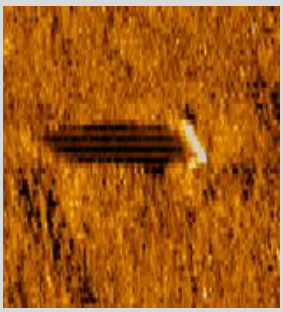
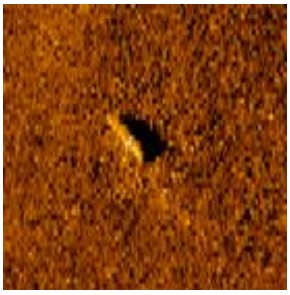
Figure 5-8: SonarWiz targeting tool.

Detection has been performed for all the objects/anomalies/obstructions that were detected during the observation of the sonograms. To prevent to pick too many targets of geological origin, it has been decided to pick:

- Objects that are isolated within a quiet and/or sandy environment.
- Objects that have an unusual shape or that looks hand-made or non-natural.

Below, in Table 5, a bibliographic comparison of detected sonographies is presented, showing the similarities between boulders and UXO.

Table 5: Comparison of sonar image of UXO and boulders using SonarWiz.

Sonar image	Photography	Identification
		**RMAK Mine** ***(Cherbourg)***
		**Boulder** ***(Normandie)***
		**BM1000** ***(Normandie)***
		**Boulder** ***(Normandie)***

5.3. SUB-BOTTOM PROFILER

5.3.1. Data acquisition

The objective during SBP data acquisition was to detect possible UXO below the seabed. Due to this, the project lines were designed with a line spacing of 30 metres.

An SBP system comprises a processing unit, which is connected through a cable to the equipment that transmits and receives acoustic energy. Seismic systems operate according to the principle by which transmitted seismic-acoustic energy affects an acoustic interface, being partially reflected by this surface. An acoustic interface is that area of the subsoil through which there is some contrast in acoustic impedance (acoustic impedance is defined as the product of the density of the medium by the propagation speed of compressional sonic waves (p waves)). Reflection is obtained by variations in acoustic impedance, which is a measure of the acoustic contrast of the materials on each side of the interface.

There are two properties that characterize any seismic system: penetration and resolution. These two properties have an inverse relationship:

- **Penetration**: Is the maximum depth at which a reflector can be detected. It depends on the power and frequency of the emitted signal; a lower frequency corresponds to a longer wavelength and greater penetration. At each interface, the amount of energy transmitted to the next decreases by an amount equal to that which has been reflected.

- **Resolution**: Is the minimum distance at which 2 consecutive reflectors can be identified, for a given frequency signal. The higher the frequency, the higher the resolution. A horizontal resolution can be considered when there are changes in the acoustic response in the horizontal plane.

SBP data was acquired using an Innomar SES 2000 compact, with a frequency of 8 kHz, 1 cycle of pulse, 20 m of sweep and a 4-8 Hz trigger rate. This SBP system was heave and

roll compensated. Navigation and real time sensor height were received directly from Qinsy. Data was recorded in 16-bit format.

5.3.2. Data processing

All sub-bottom profiler data processing was carried out using SonarWiz software. The files were heave and tidally corrected, to ensure that the SBP data matched up with corresponding MBES data. Frequency filtering and a TVG were also applied and then pre-processed SEGY files exported. SEGY files were then imported into Seisee software, for final QC. The SBP data were deemed to be of good quality, throughout the survey.

Onboard SBP processing and quality control workflow was performed as follows:

i. Importing raw files (.JSF files in the case of Edgetech equipment) or converting raw files to SEG-Y format, through SES Converter (in the case of Innomar compact) and import them into the SonarWiz software.
ii. Navigation Quality Control, looking for stable navigation, without peaks and gaps.
iii. Bottom tracking, Gain configuration and frequency filtering.
iv. Ticking off SBP lines against the online log, to make sure a complete data set was present
v. Tide and heave correction and verification, with a pre-processed bathymetric grid. With this bathymetric grid, the separation offsets of the SBP data were observed against the real multibeam seabed, and this was applied to give a 3D reference to the SBP data.

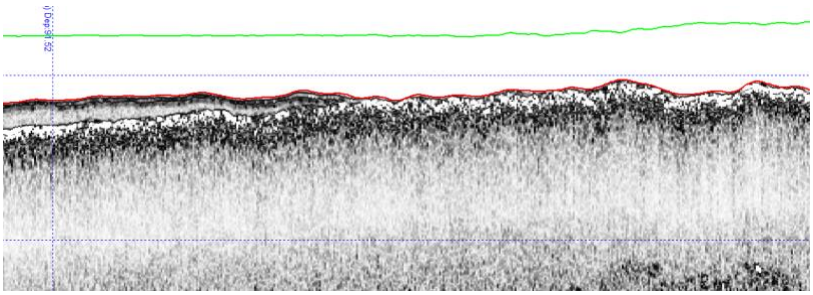


Figure 5-9: Example of a SBP profile before applying tides, heave and swell and referencing to a bathymetric grid.

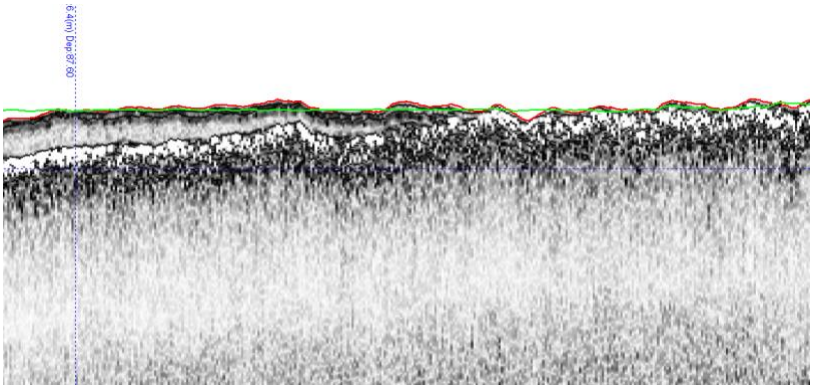


Figure 5-10: Example of a SBP profile after applying tides, heave and swell and referencing to a bathymetric grid.

5.3.3. Target picking

The processed profiles are then visualized in SonarWiz, where the dynamic color scale is adjusted, in order to visualize the data at greater depths by playing on with the contrasts. The "Target Picker" tool allows data acquisition by pointing points along the profiles.

The pointed data is then exported into a grid (x, y, z) and can be added in the map of the project. For each pointed target, a ".gif" file is exported in order to clearly see the picked target over the SBP profile.

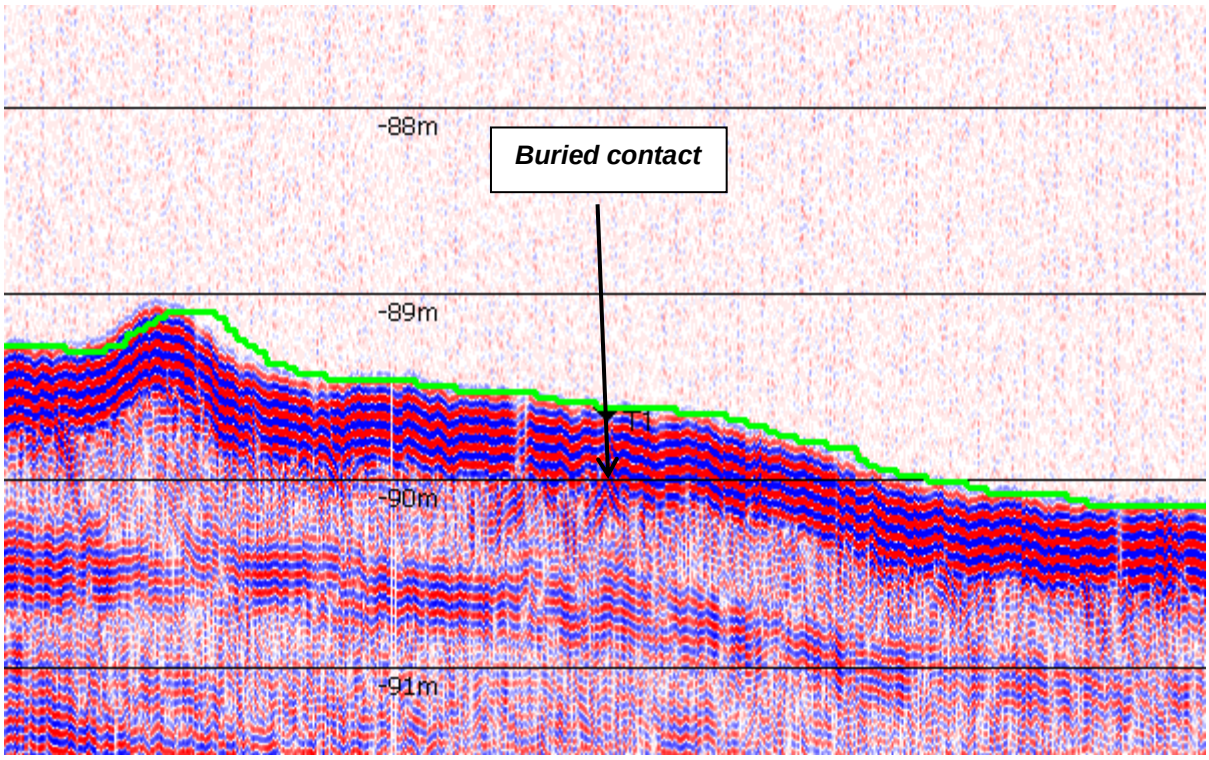


Figure 5-11: Target example along a SBP profile.

This analysis of the profile allows the identification of punctual objects, but not specifically ferromagnetic elements. It can therefore be difficult to distinguish anthropogenic elements from geological elements (boulders, gravel, coarser sediments, etc.).

It has been selected contacts that could be characteristic of buried punctual objects. Contacts causing refraction hyperbolas, particularly intense reflectors, isolated and contrasting within the surrounding sediments, atypical reflectors such as sloping or angular reflectors.

6. RESULTS

6.1. TARGET PICKING

Sidescan sonar anomalies were picked all along the sidescan sonar lines, and not only in the vicinity of the UXO boxes. Sidescan sonar anomalies are listed in the APPENDIX II – TARGET LIST.

6.2. DISCRIMINATION OF pUXO TARGETS

The identification of punctual objects has been made but cannot specify if there are ferromagnetic elements. It can therefore be difficult to distinguish anthropogenic elements from geological elements (boulders, gravel, coarser sediments, etc.).

Any anomaly can therefore correspond to a potential UXO

7. AVOIDANCE DISTANCES

Following the analysis, we are looking for as low as reasonably practicable (ALARP), areas that can be considered clear of any pUXO. The avoidance criteria has been defined following the UXO threat and risk assessment with geotechnical investigation risk mitigation strategy recognised and the desktop studies (**Ref. 01**):

Thus, the avoidance distance can be calculated as follows (Figure 7-1):

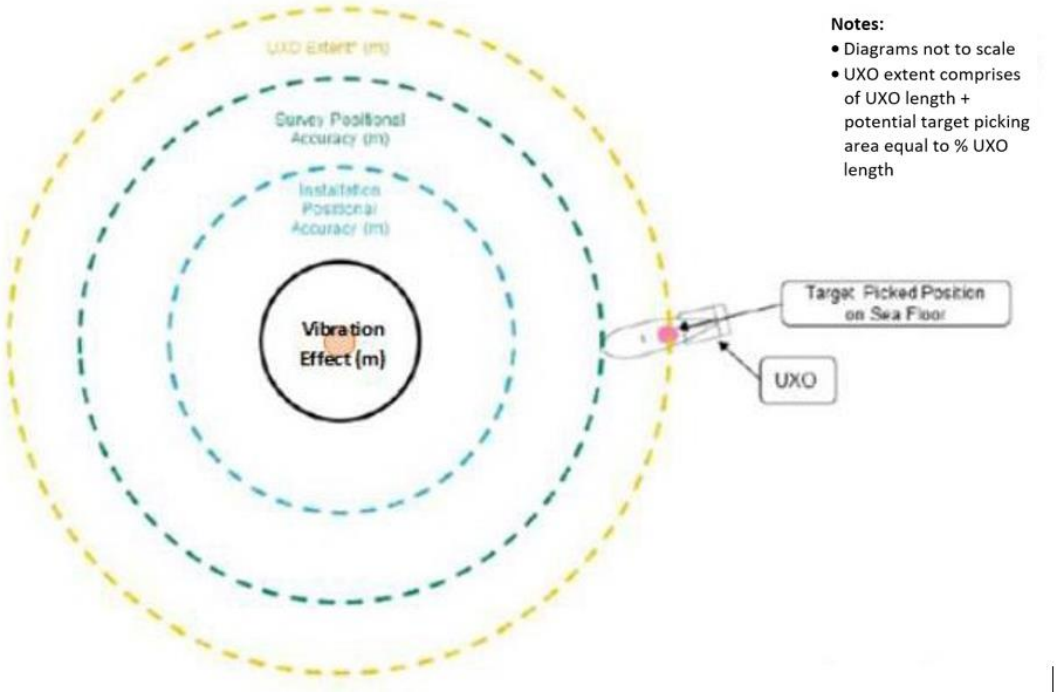


Figure 7-1: Avoidance distances.

Avoidance distance = Geotechnical tool width + Vibration effect distance + Geotechnical tool positioning accuracy + UXO survey accuracy + Ammunition length

The effect of the generation of seismic waves during vibro-driving or pile driving has to take in account in the case of geotechnical drilling or pile driving. The machines generate a wide variety of seismic waves (pressure, Rayleigh shear) (*Study report DRS17-164706-11171B, INERIS*) that can trigger UXO detonation. This effect should not be considered for other geotechnical work such as jack up or anchor installation.

For the **OWF area**, the **15 m buffer** has been applied as avoidance distance according to the document delivered by 6 Alpha Associates Limited (**Ref. 01**).

A safety buffer of 15 m is to be employed from any isolated anomaly.

This was achieved through geospatial processing by QGIS software.

First, the areas that could not be considered as white areas are mapped, grouping the pUXO targets (MBES, SSS and SBP contacts) and potential saturated areas. Afterwards, the “avoidance areas” are mapped with an avoidance zone of 15 meters (a 15 m safety buffer around the anomaly) away from all the potential UXO (pUXO) anomalies or any saturated or excluded areas. This avoidance area is also applied from the edge of the dataset inwards the center of the survey area.

Then the free space between these avoidance areas and the detection surface and the survey limits is mapped, and a workable area is obtained.

8. CONCLUSION

ALARP areas of 18.000 m^2 has been found for the 20 GI locations. An alternative location has been found for 8 positions and has been indicated in grey in Table 6.

Table 6: Final GI box locations.

ID	GI box	UTM X	UTM Y	Original coordinates and distance (m)
1	Z2_OWF_B01	637022.00	4769227.00	-
2	Z2_OWF_B02	633436.17	4766958.53	633378.29 4767059.46 114.90 m
3	Z2_OWF_B03	634468.00	4765244.00	-
4	Z2_OWF_B04	635191.00	4761969.00	-
5	Z2_OWF_B05	630076.80	4760198.55	630095.02 4760168.22 36.84 m
6	Z2_OWF_B06	629018.45	4761945.89	629004.22 4761980.65 36.61 m
7	Z2_OWF_B07	628283.00	4765253.00	-
8	Z2_OWF_B08	623919.00	4766350.00	-
9	Z2_OWF_B09	626097.00	4768888.00	-
10	Z2_OWF_B10	629371.00	4769628.00	-
11	Z2_OWF_B11	632656.00	4770340.00	-
12	Z2_OWF_B12	632298.00	4775070.00	-
13	Z2_OWF_B13	628659.00	4772883.00	-
14	Z2_OWF_B14	626460.24	4776487.12	626484.42 4776517.50 40.11 m
15	Z2_OWF_B15	624293.00	4773989.00	-

ID	GI box	UTM X	UTM Y	Original coordinates and distance (m)
16	Z2_OWF_B16	622079.69	4771393.76	622106.91 4771445.76 62.45 m
17	Z2_OWF_B17	621375.00	4768536.00	-
18	Z2_OWF_B18	618837.08	4770755.42	618836.67 4770716.42 41.34 m
19	Z2_OWF_B19	619896.18	4775041.59	619934.138 4775086.70 60.71 m
20	Z2_OWF_B20	622067.95	4777572.56	622114.99 4777634.24 78.79 m

9. REFERENCES

In accordance with:

- Letter the "*Inspection des poudres et explosifs*" of the French Ministry of Defence and the *"Direction générale du Travail*" of the French Ministry of Labour of September 18th 2013 relating to pyrotechnic clearance carried out on civil land.
- Decree No. 2014-381 of March 28 2014 regulatory part Art. R.733-1 to 16 and legislative part Art. L. 733-1 to 3.

In reference to:

- Decree No. 2005-1325 of October 26 2005 amended from the Ministry of Defence relating to the safety rules applicable during work in the context of a pyrotechnic clearance site and the two implementing decrees.

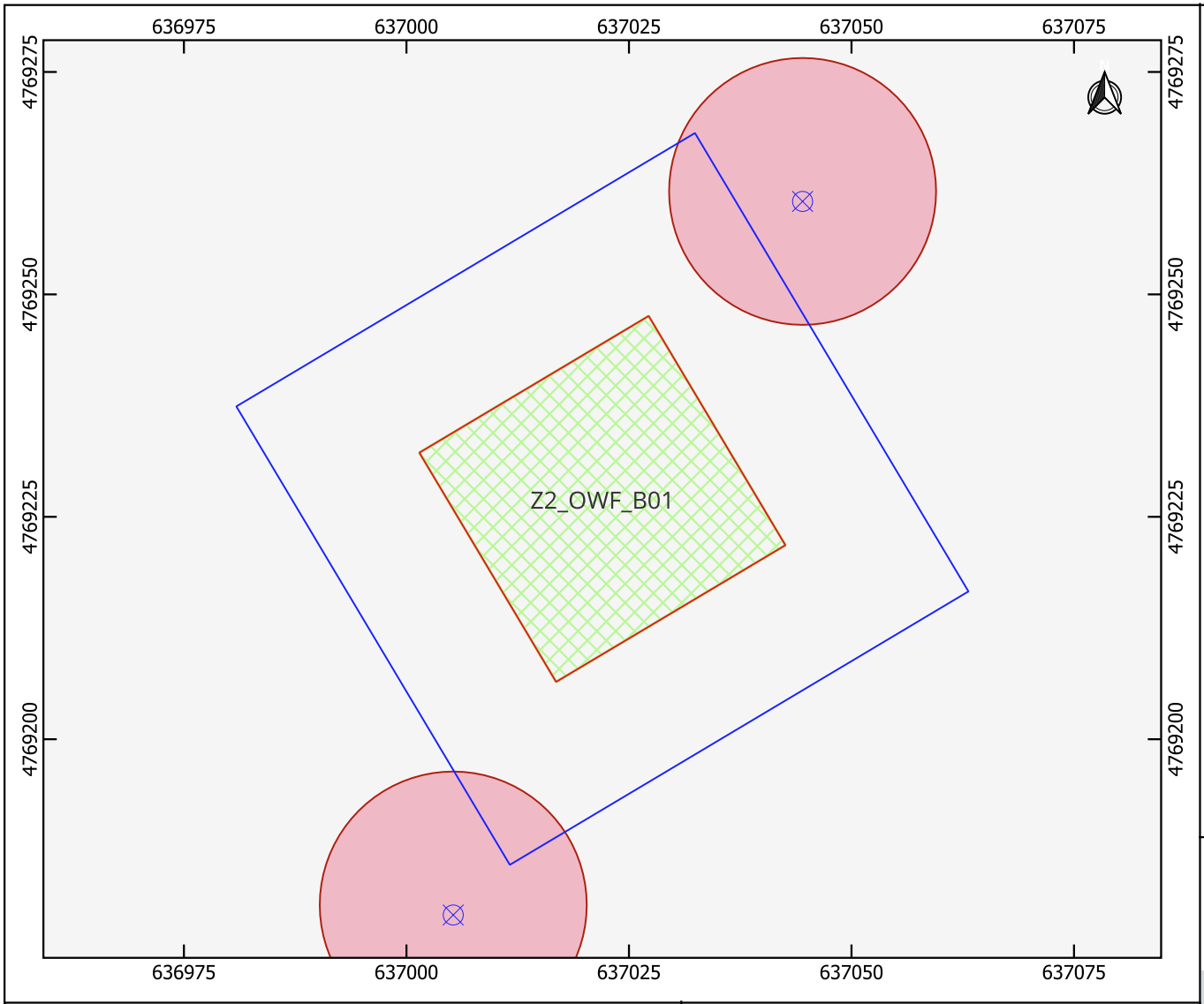
Ref.01. Unexploded Ordnance Threat and Risk Assessment: *9797_UXOTARA_AO6 Mediterranean_DNV_V1.*

Ref.02. Travaux sous-marins – Rapport final : RTE Midi Provence – Détection sous-marine Magnétométrique REV2 – Géomines

Ref.03. Etude historique pyrotechnique – RTE Projet Midi Provence – Géomines

Ref.04. 002GR17-JFM – Elenkhos Special Risks & consulting – Rapport d'évaluation des risques sur munitions non explosées

APPENDIX I – ALARP CERTIFICATE MAPS



TECNOAMBIENTE
A TRADEBE COMPANY

MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE

FUGRO

ANNEXE A: AO6_Z2_OWF_B01
ALARP CERTIFICATE GIS

Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

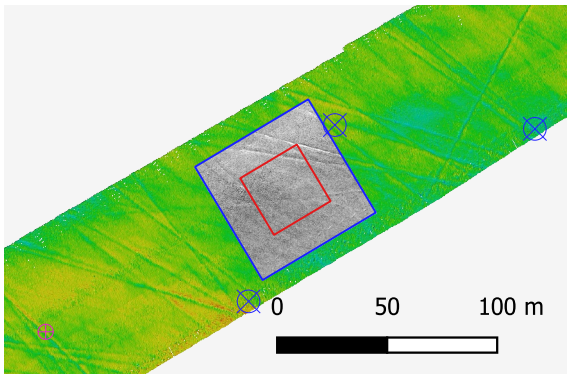
Original Location

x=637022, y=4769227

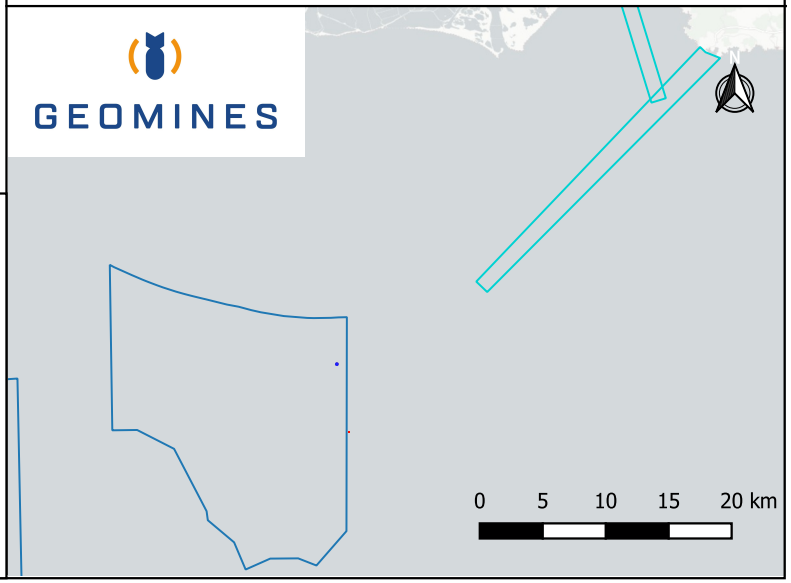
OWF Zone 2
- Geotechnical Boxes OWF zone 2
- Survey extent

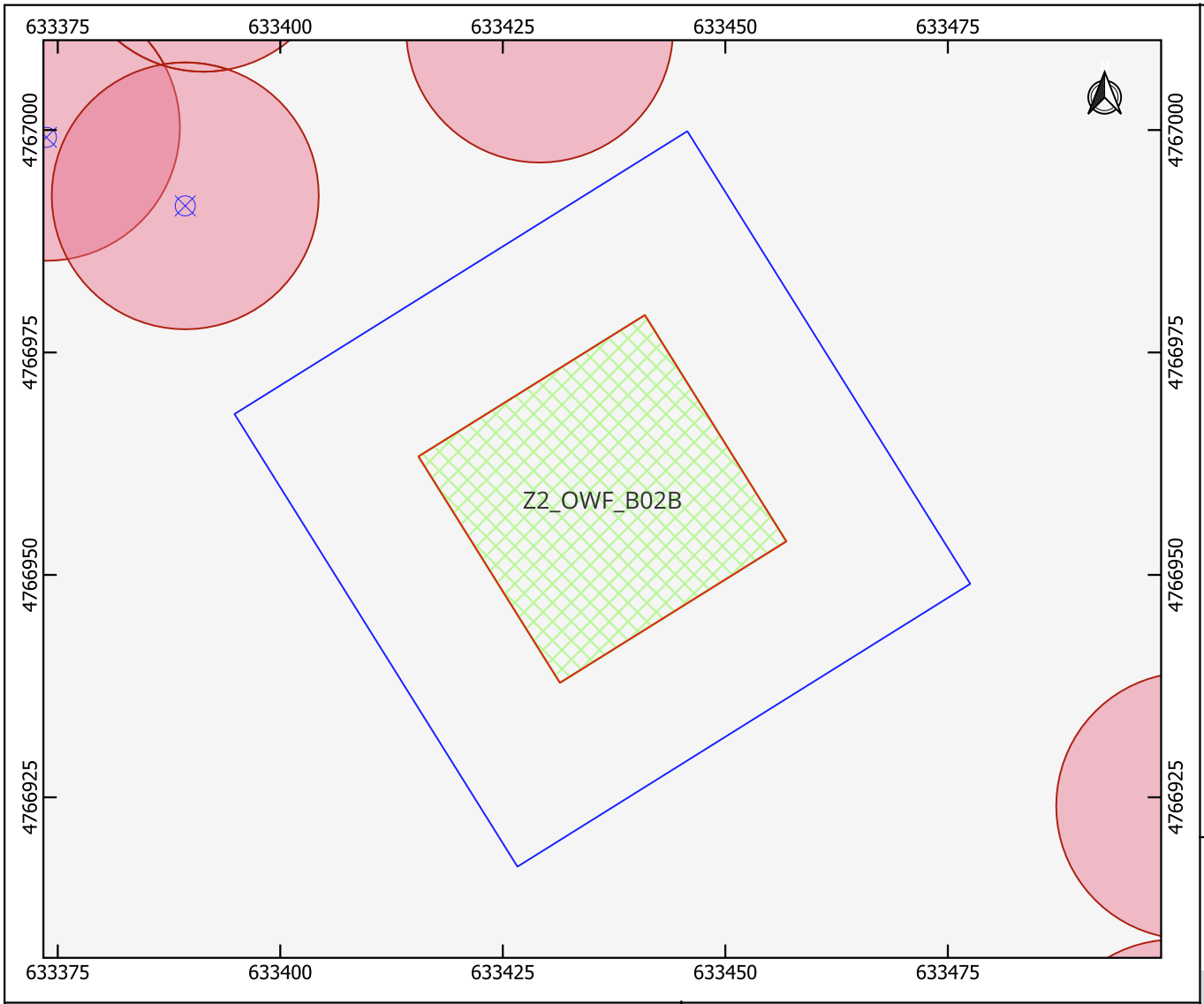
Concession
- Zone Parc AO6
- Zone corridors AO6

ALARP
- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance



GEOMINES





ANNEXE A: AO6_Z2_OWF_B02B ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Alternate Location

x=4766958.528, y=4766958.528

OWF Zone 2

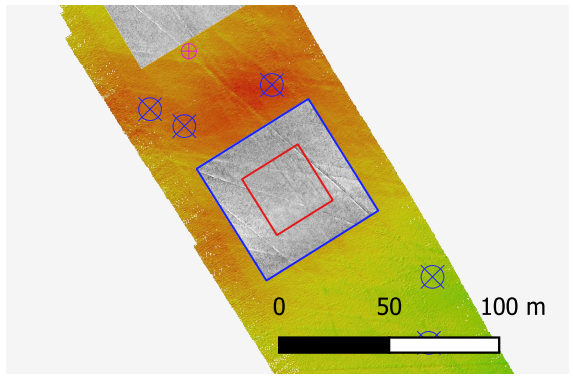
- Geotechnical Boxes OWF zone 2
- Survey extent

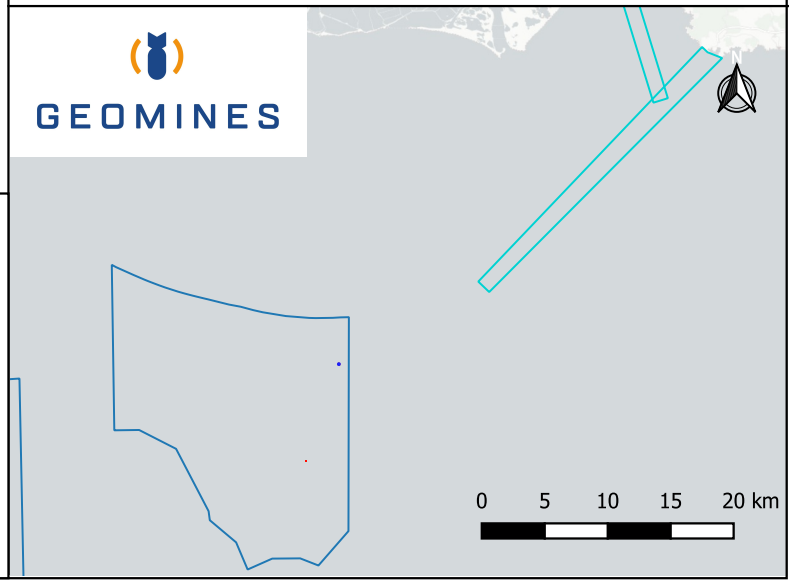
Concession

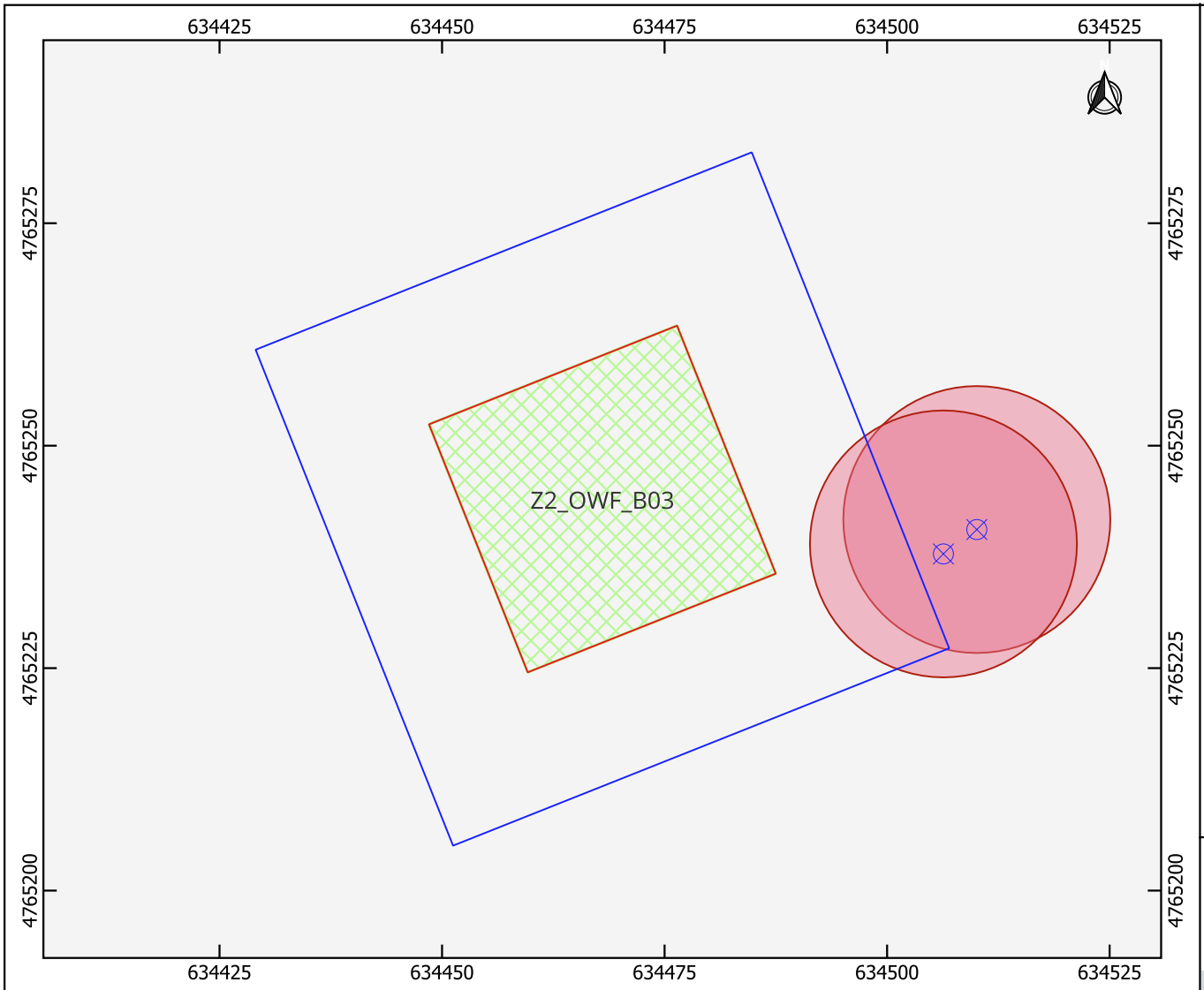
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B03
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Original Location

x=634468, y=4765244

OWF Zone 2

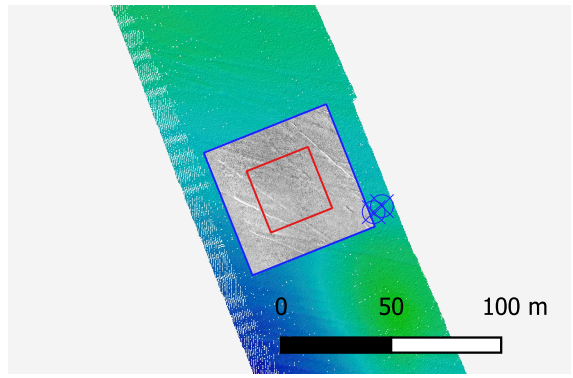
- Geotechnical Boxes OWF zone 2
- Survey extent

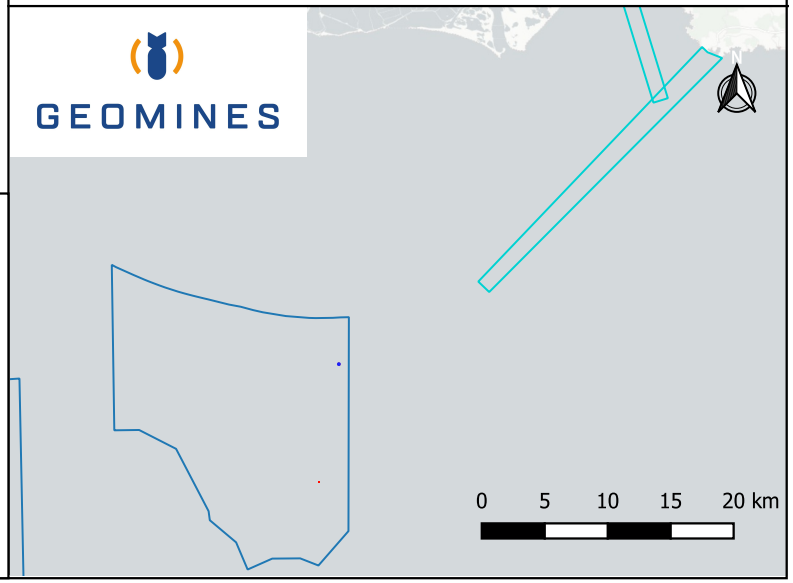
Concession

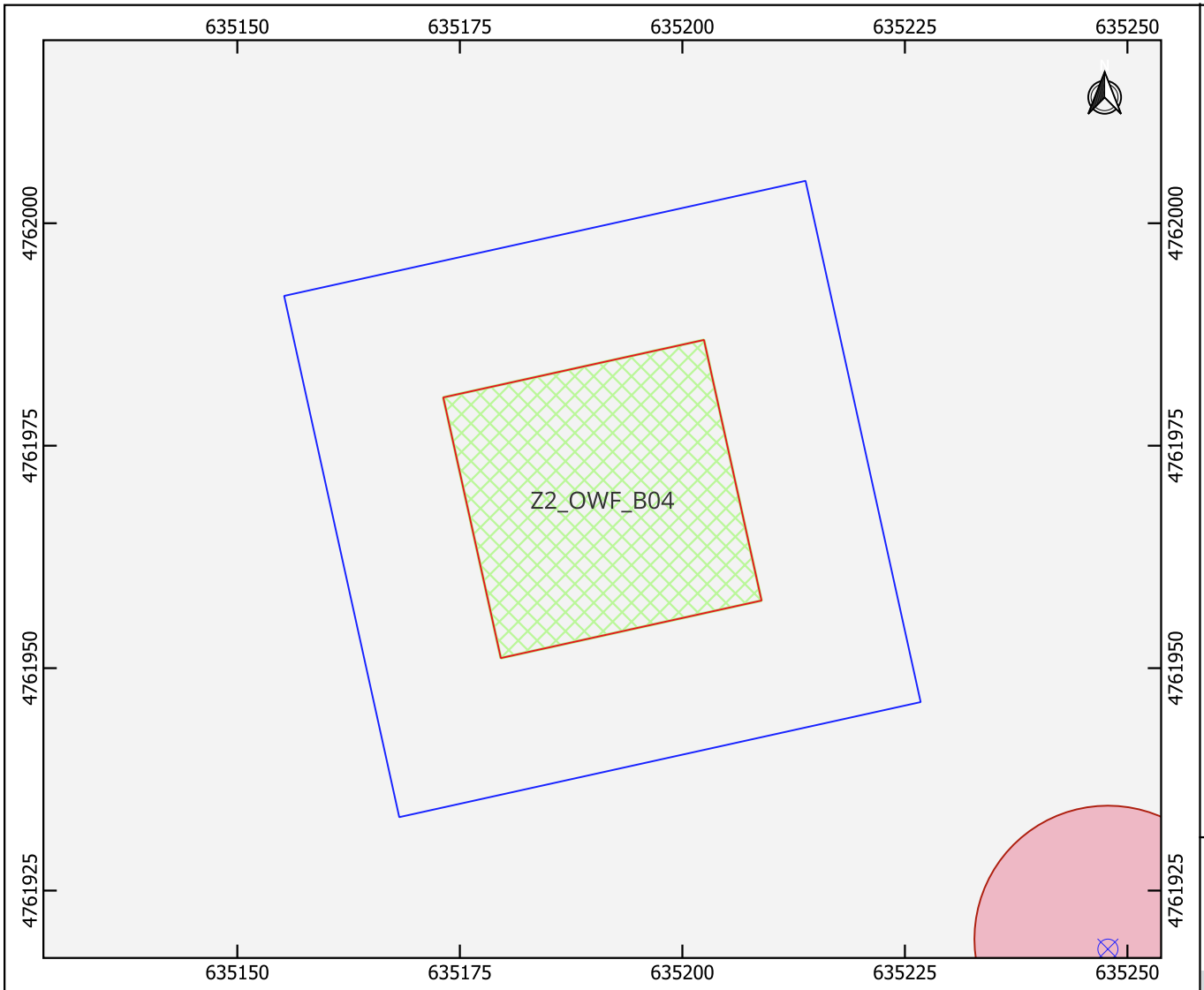
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B04
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Original Location

x=635191, y=4761969

OWF Zone 2

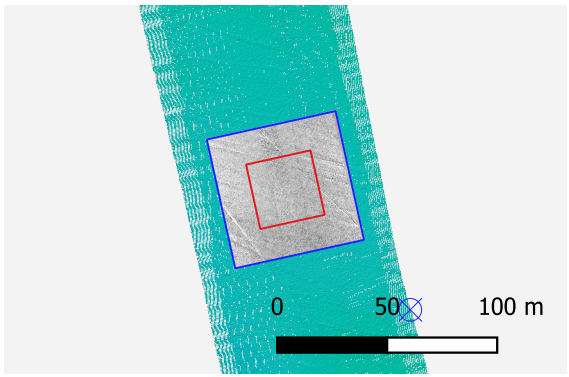
- Geotechnical Boxes OWF zone 2
- Survey extent

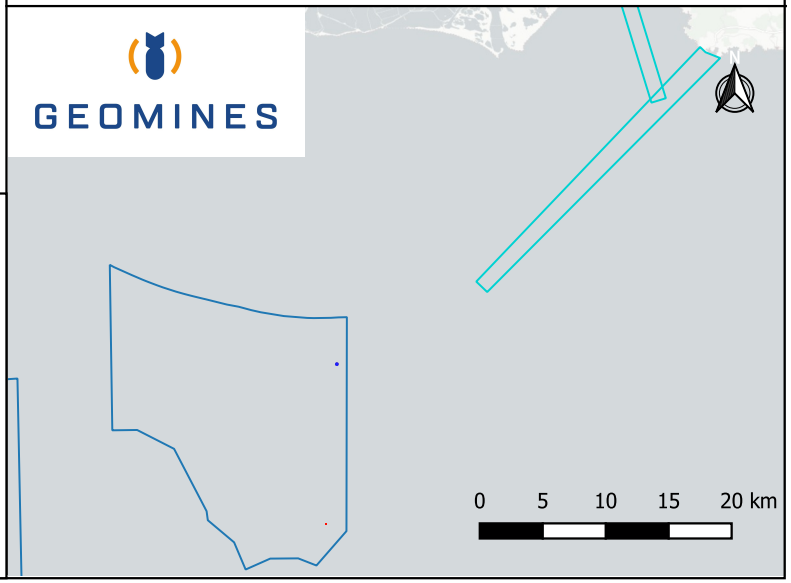
Concession

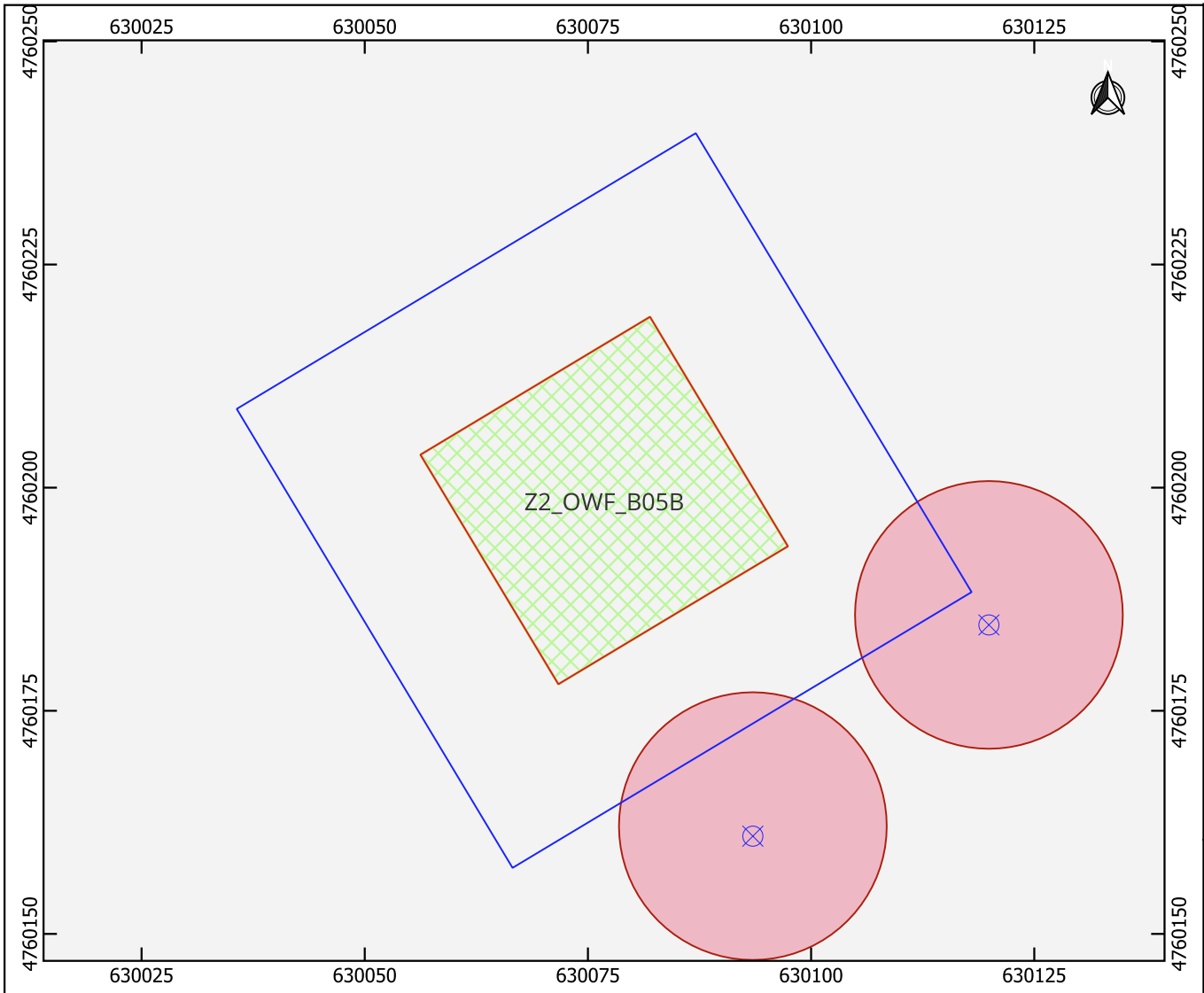
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







TECNOAMBIENTE
A TRADEBE COMPANY

MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE

FUGRO

ANNEXE A: AO6_Z2_OWF_B05B
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Alternate Location

x=4760198.551, y=4760198.551

OWF Zone 2

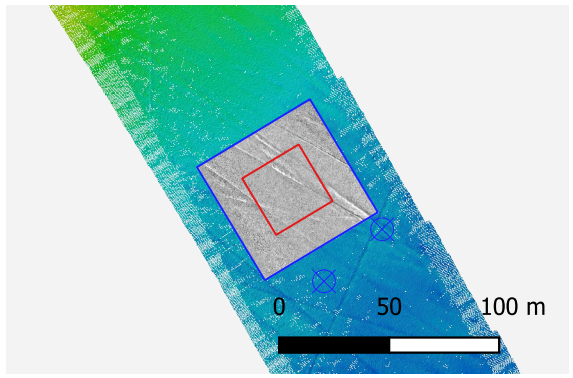
- Geotechnical Boxes OWF zone 2
- Survey extent

Concession

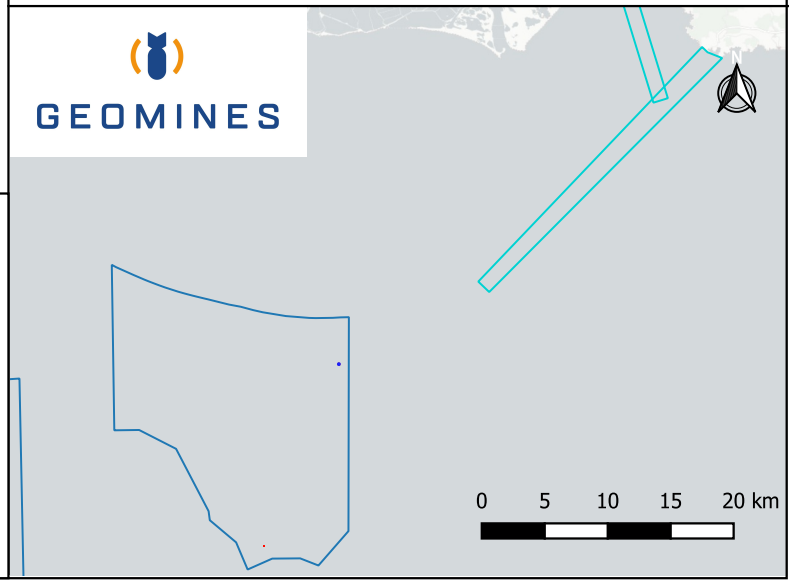
- Zone Parc AO6
- Zone corridors AO6

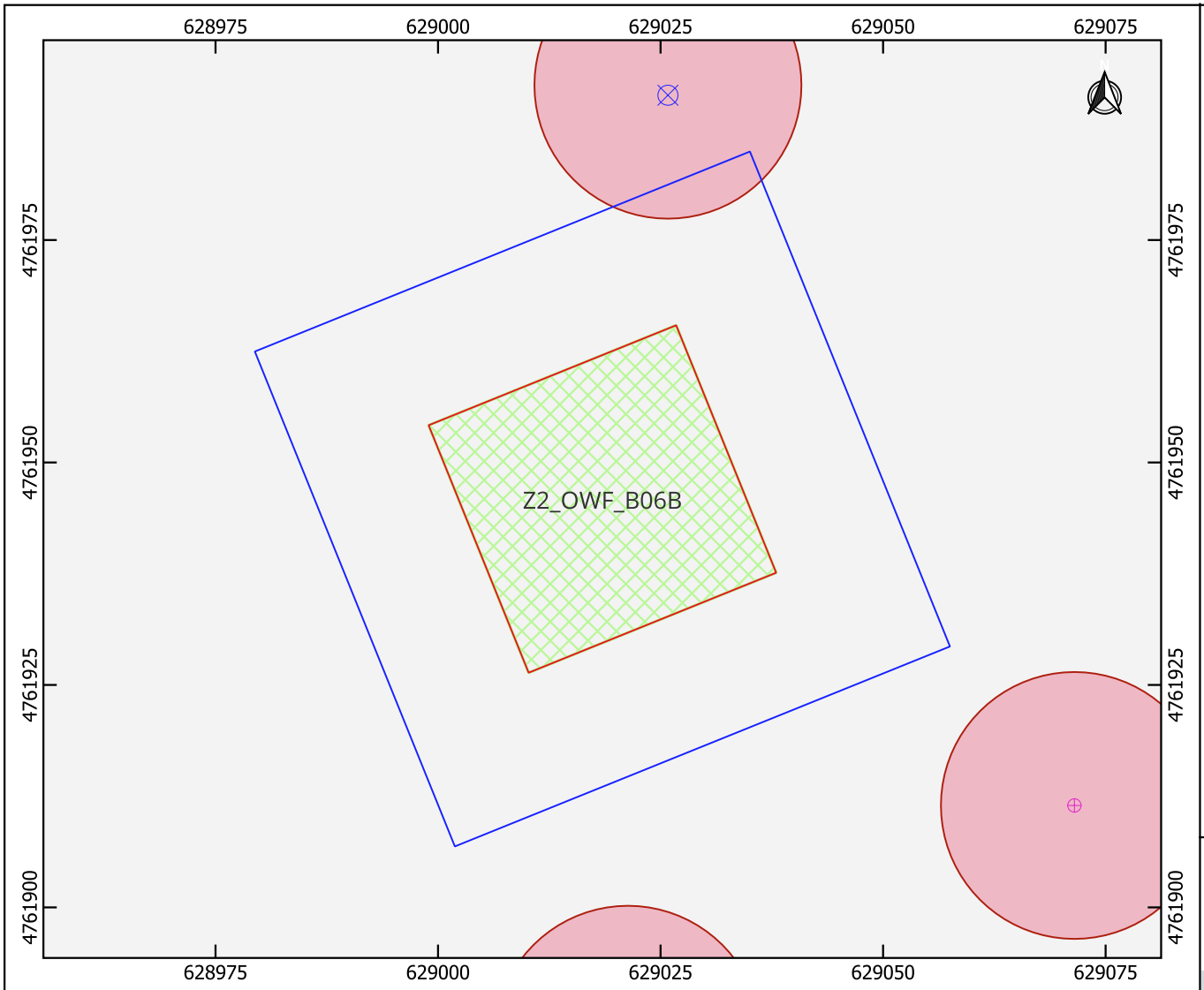
ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance



GEOMINES





ANNEXE A: AO6_Z2_OWF_B06B ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Alternate Location

x=4761945.887, y=4761945.887

OWF Zone 2

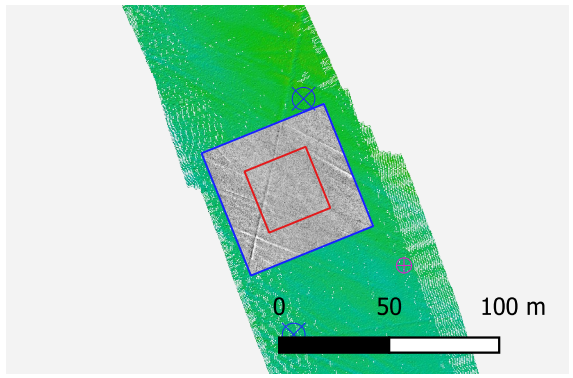
- Geotechnical Boxes OWF zone 2
- Survey extent

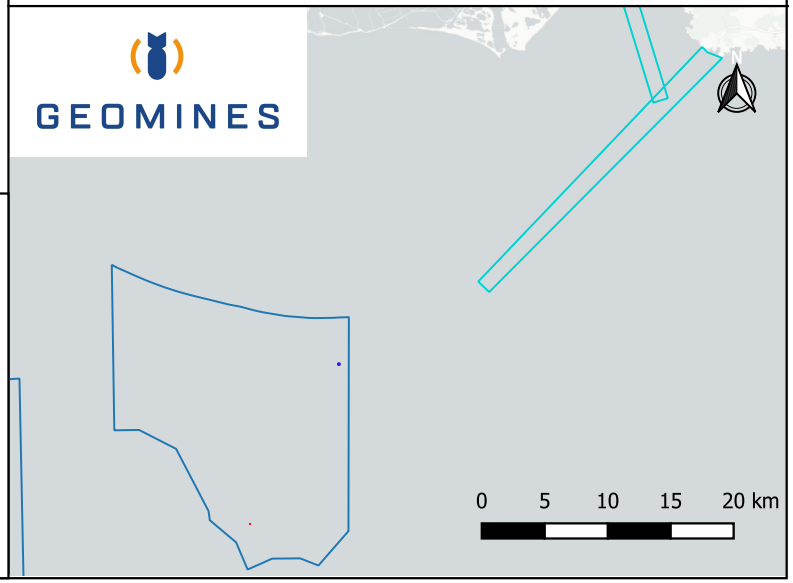
Concession

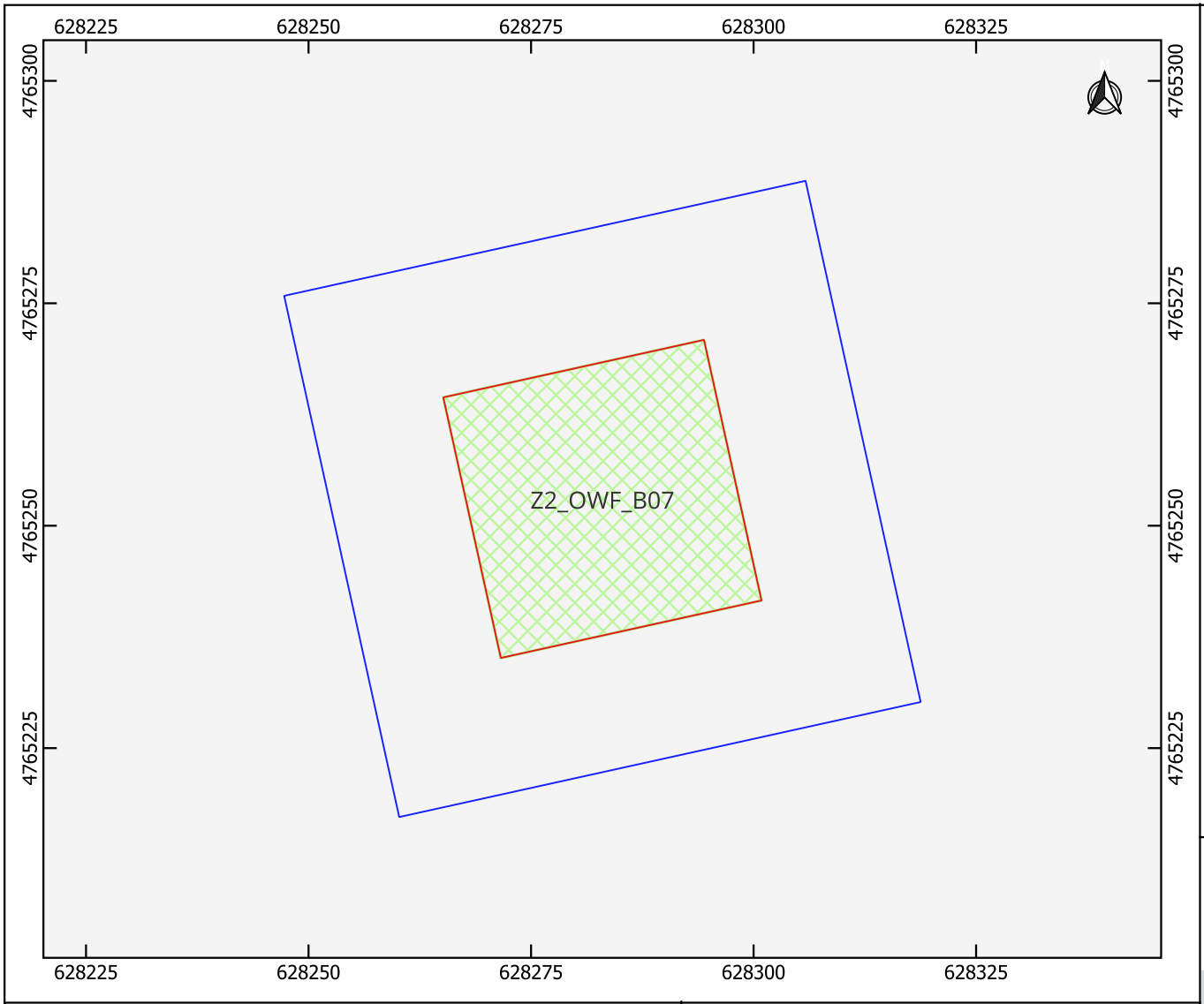
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B07
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Original Location

x=628283, y=4765253

OWF Zone 2

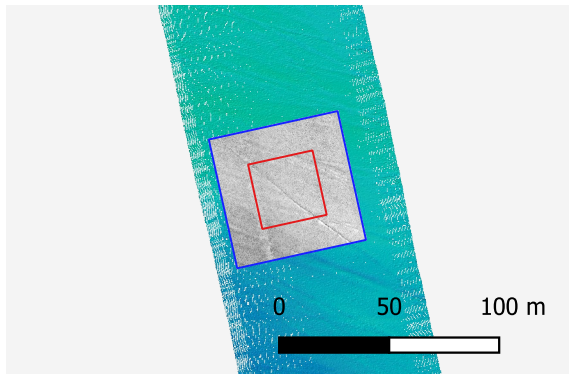
- Geotechnical Boxes OWF zone 2
- Survey extent

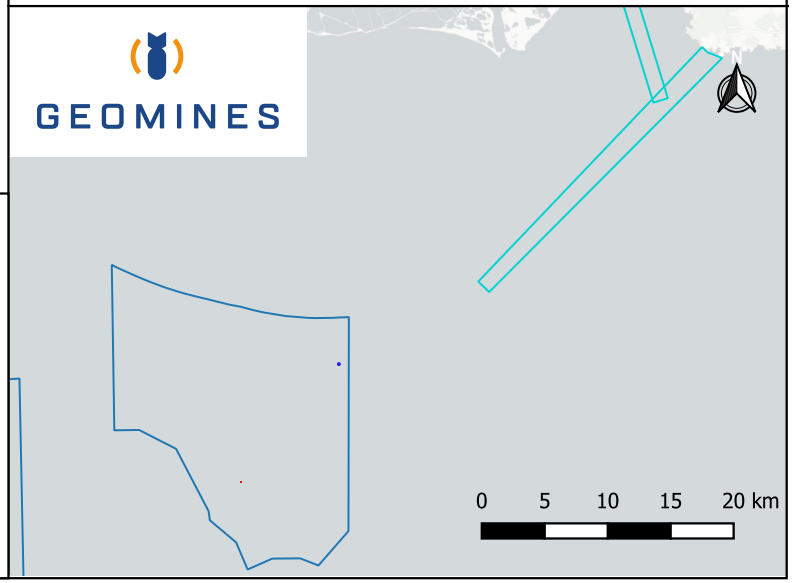
Concession

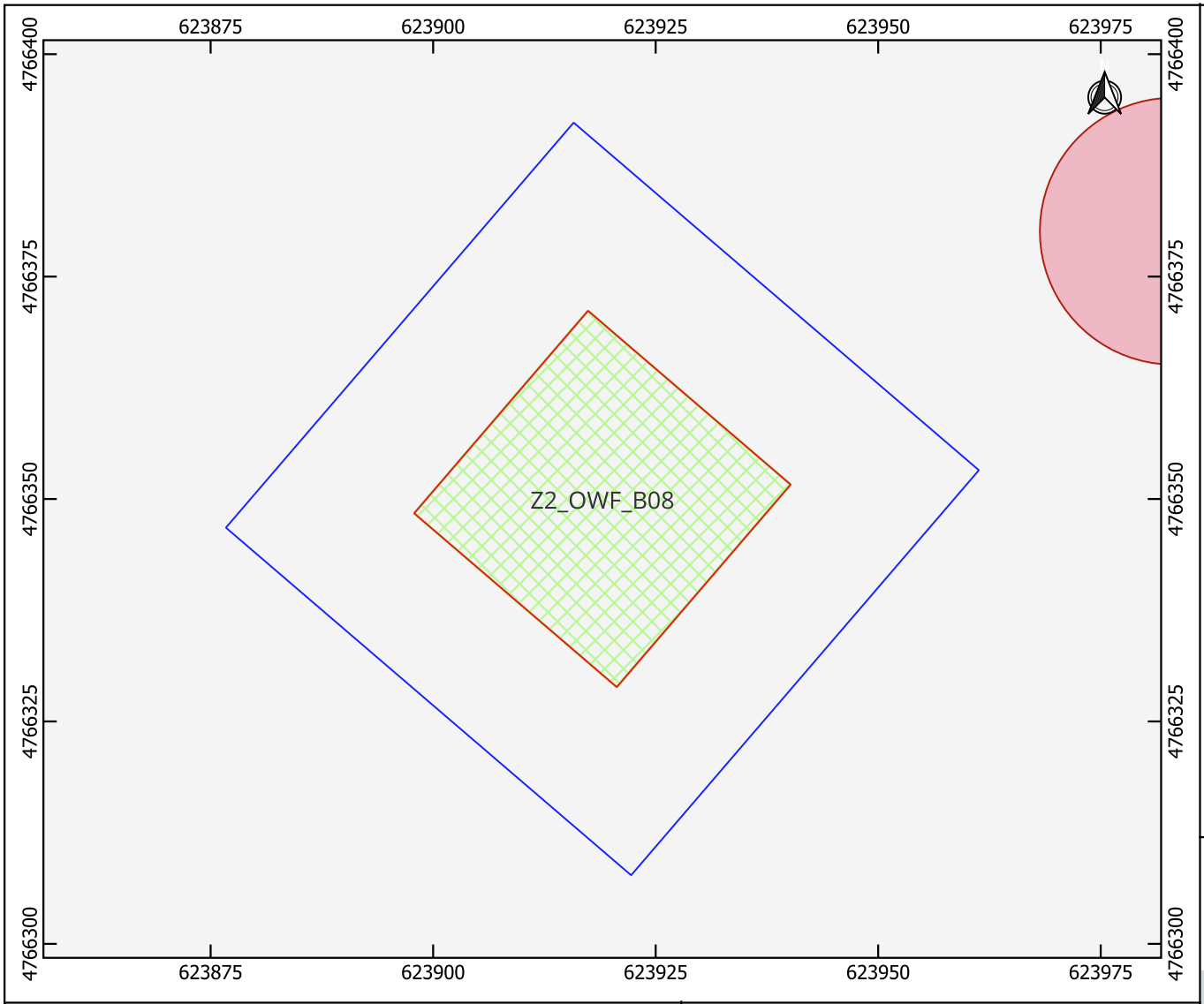
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B08
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Original Location

x=623919, y=4766350

OWF Zone 2

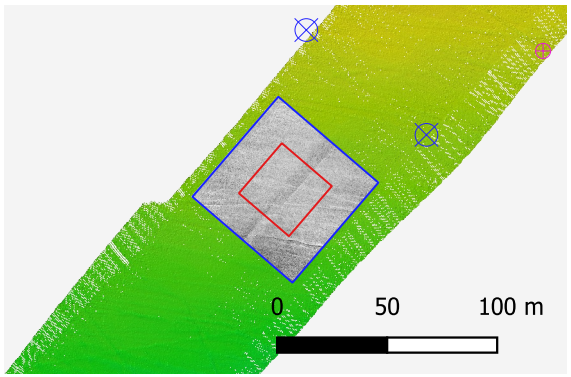
- Geotechnical Boxes OWF zone 2
- Survey extent

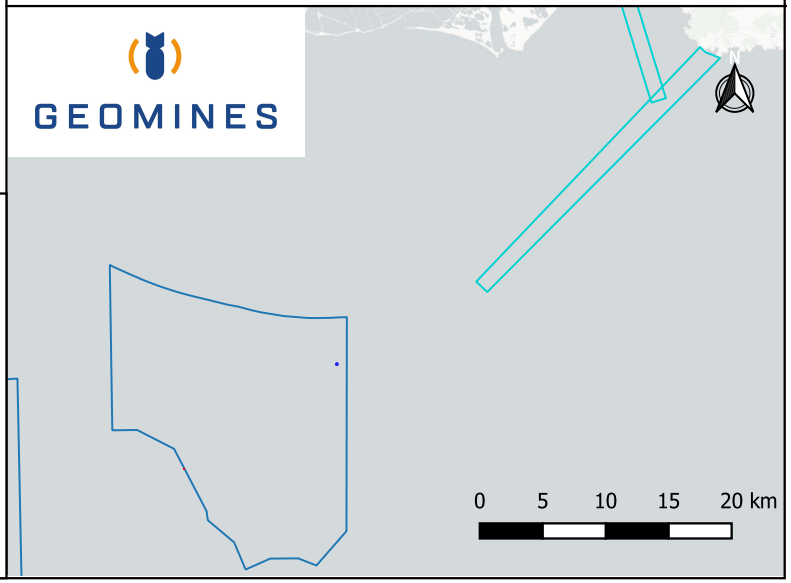
Concession

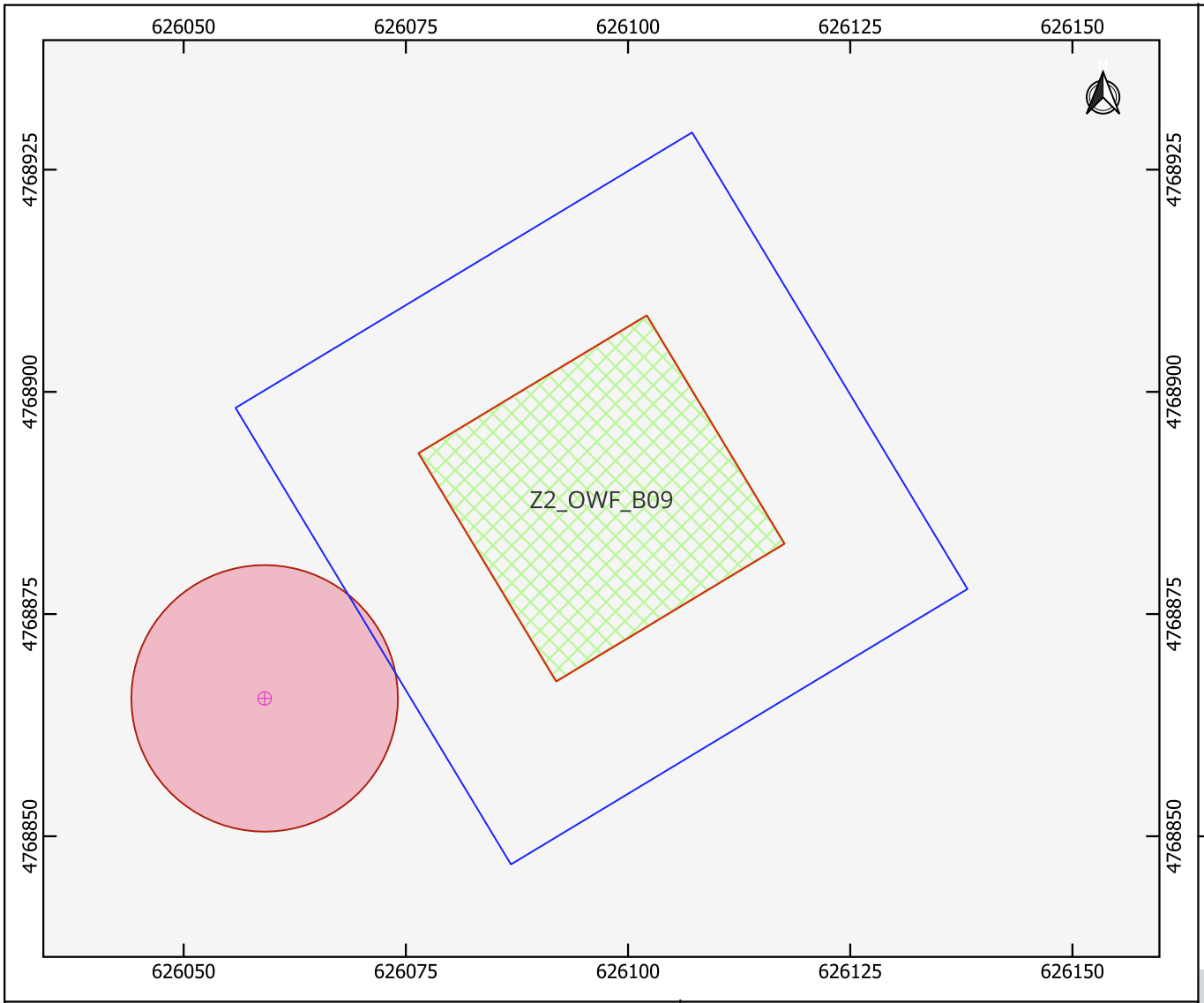
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B09
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Original Location

x=626097, y=4768888

OWF Zone 2

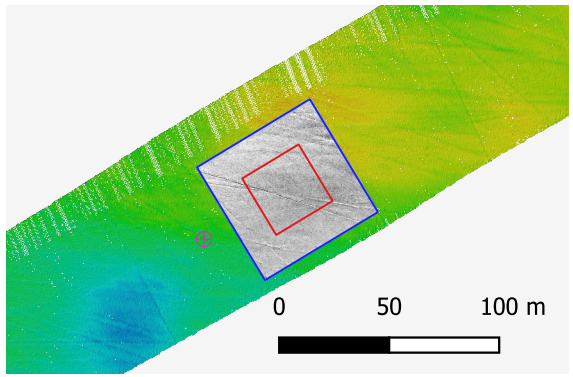
- Geotechnical Boxes OWF zone 2
- Survey extent

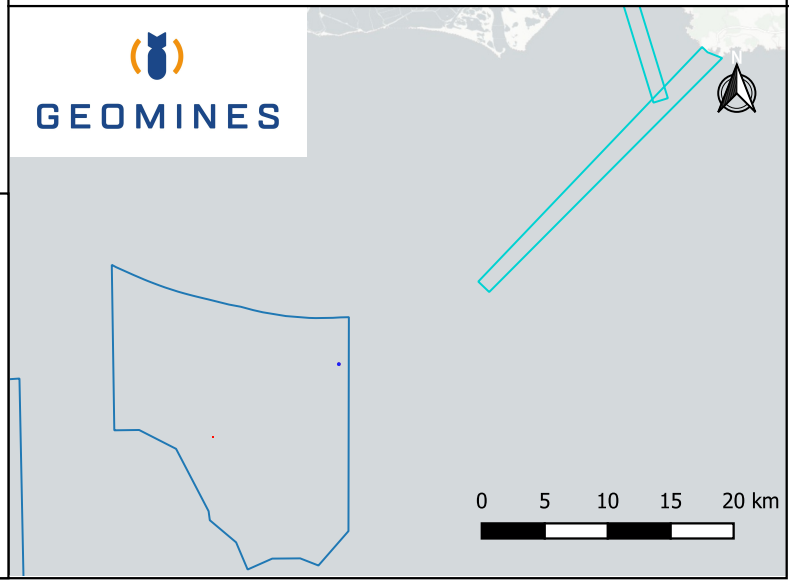
Concession

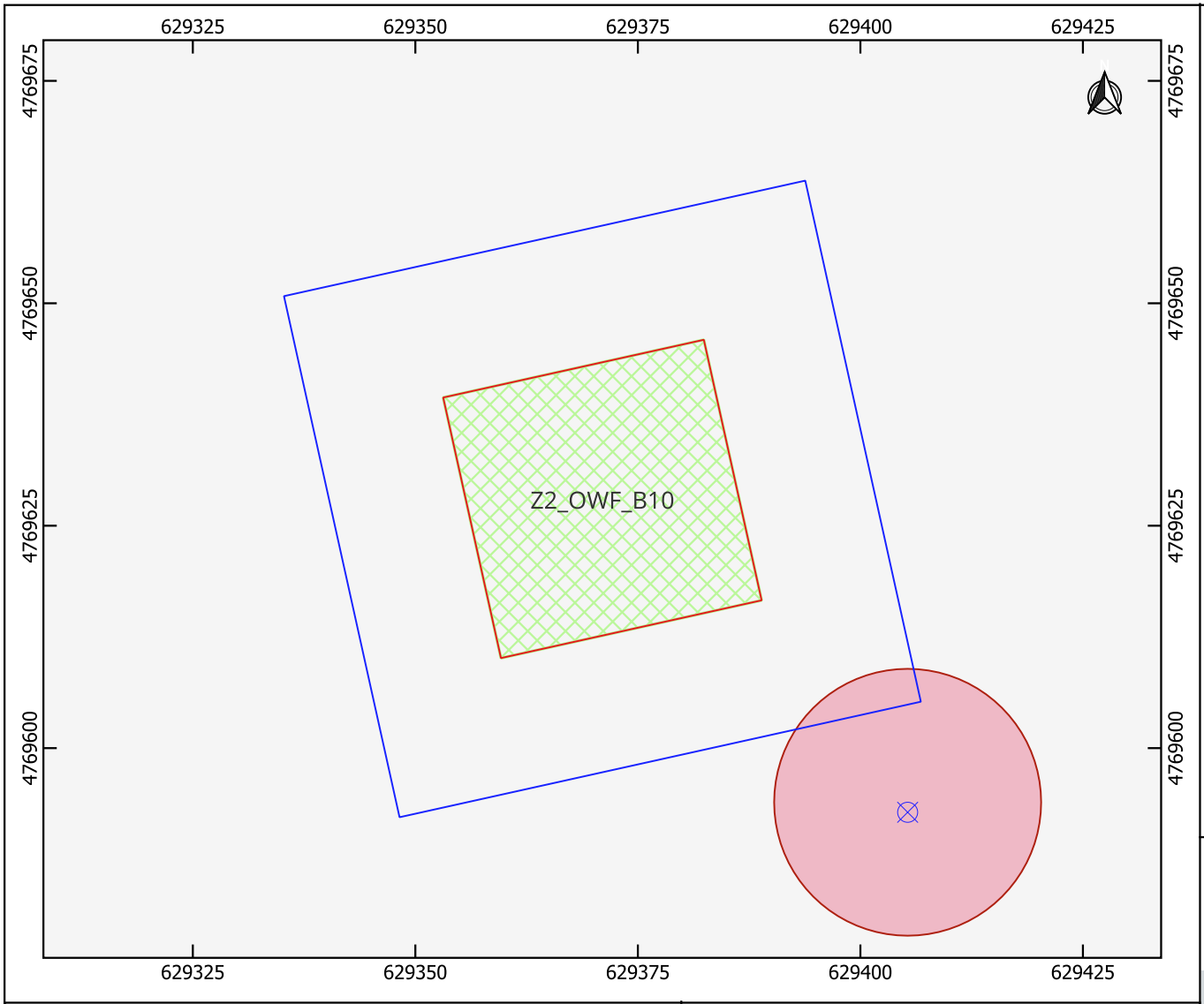
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B10
ALARP CERTIFICATE GIS

Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

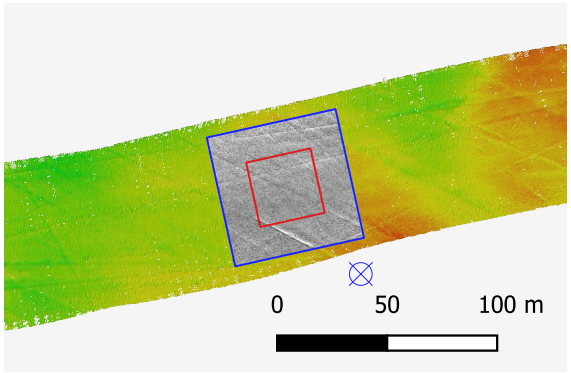
Original Location

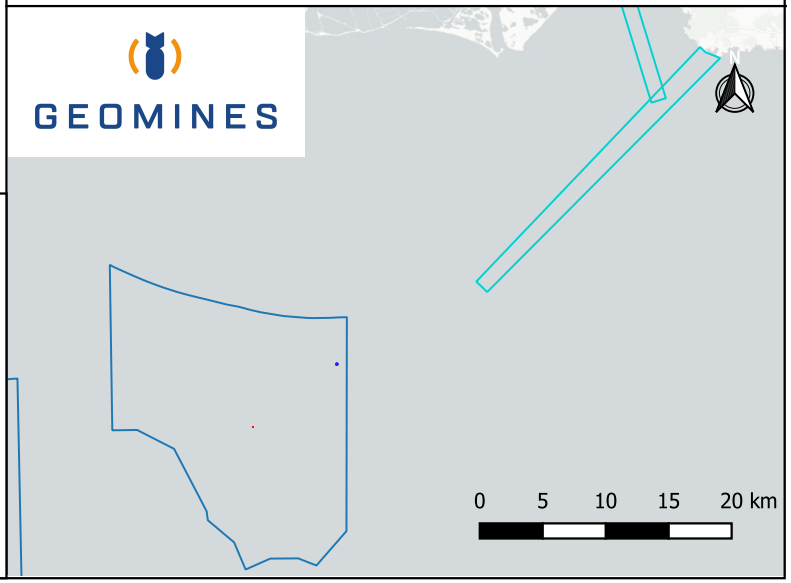
x=629371, y=4769628

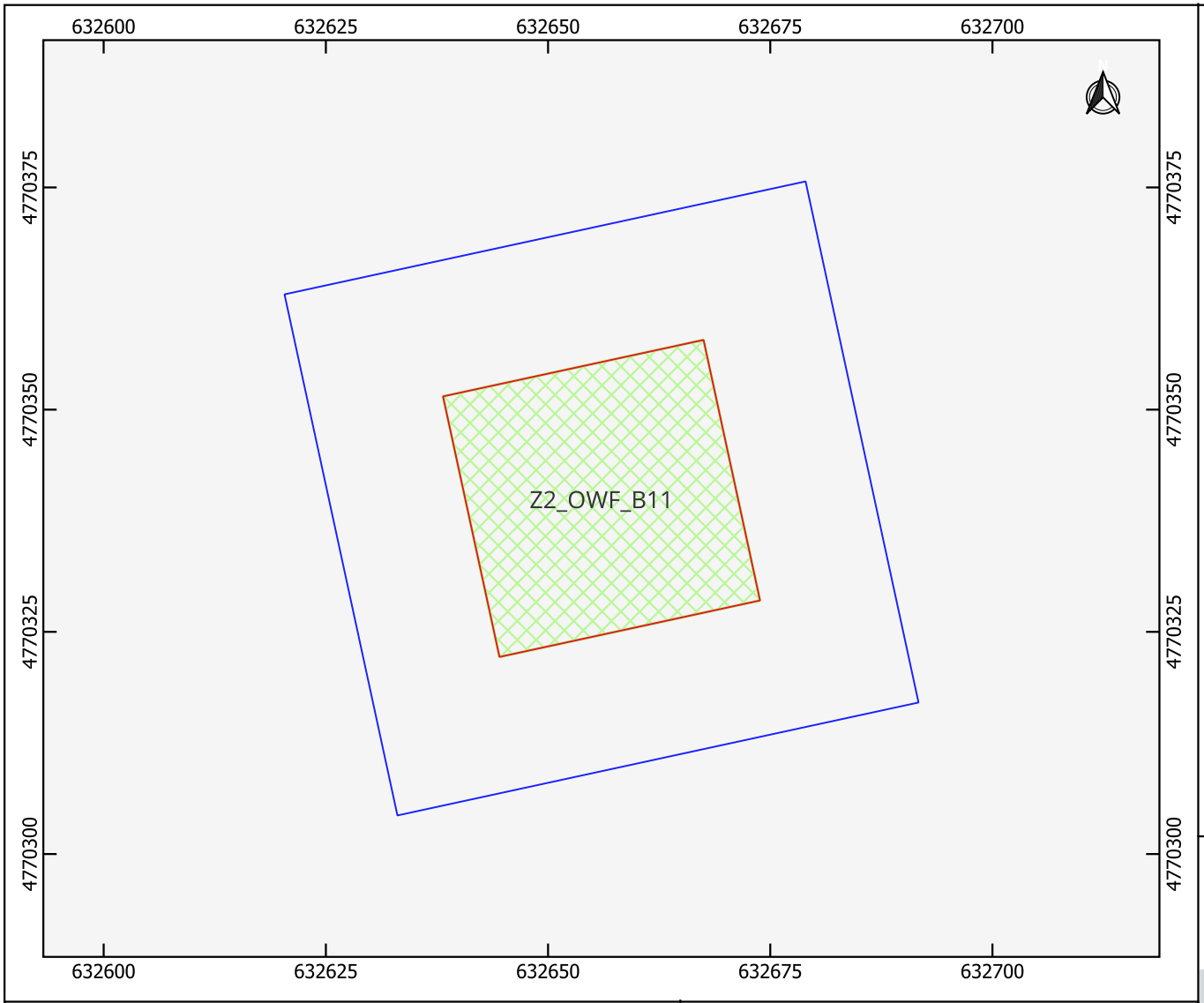
OWF Zone 2
- Geotechnical Boxes OWF zone 2
- Survey extent

Concession
- Zone Parc AO6
- Zone corridors AO6

ALARP
- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B11
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Original Location

x=632656, y=4770340

OWF Zone 2

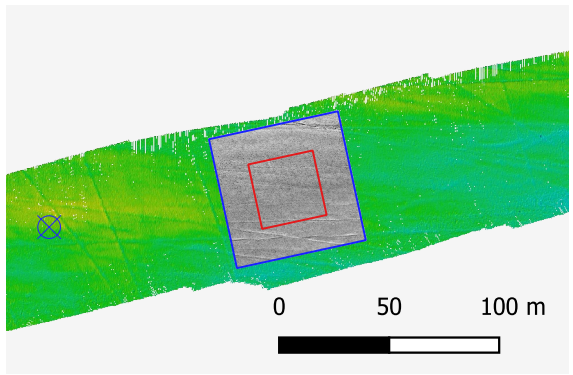
- Geotechnical Boxes OWF zone 2
- Survey extent

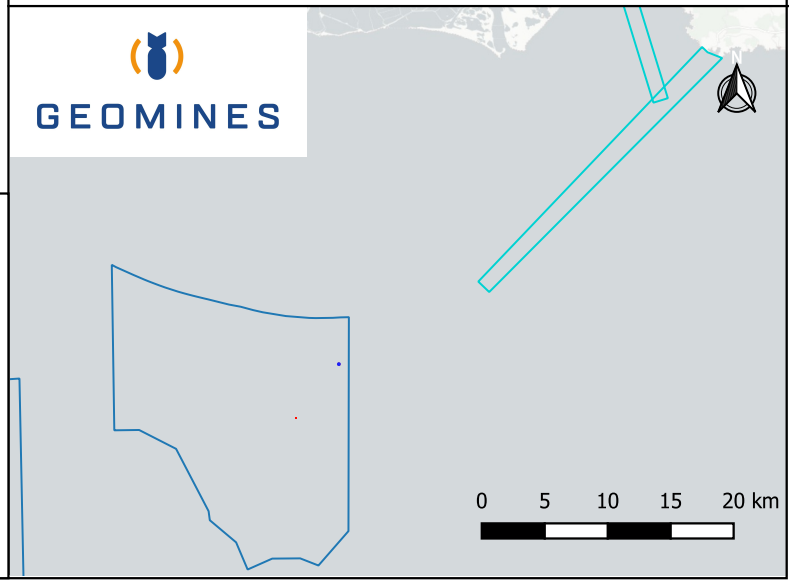
Concession

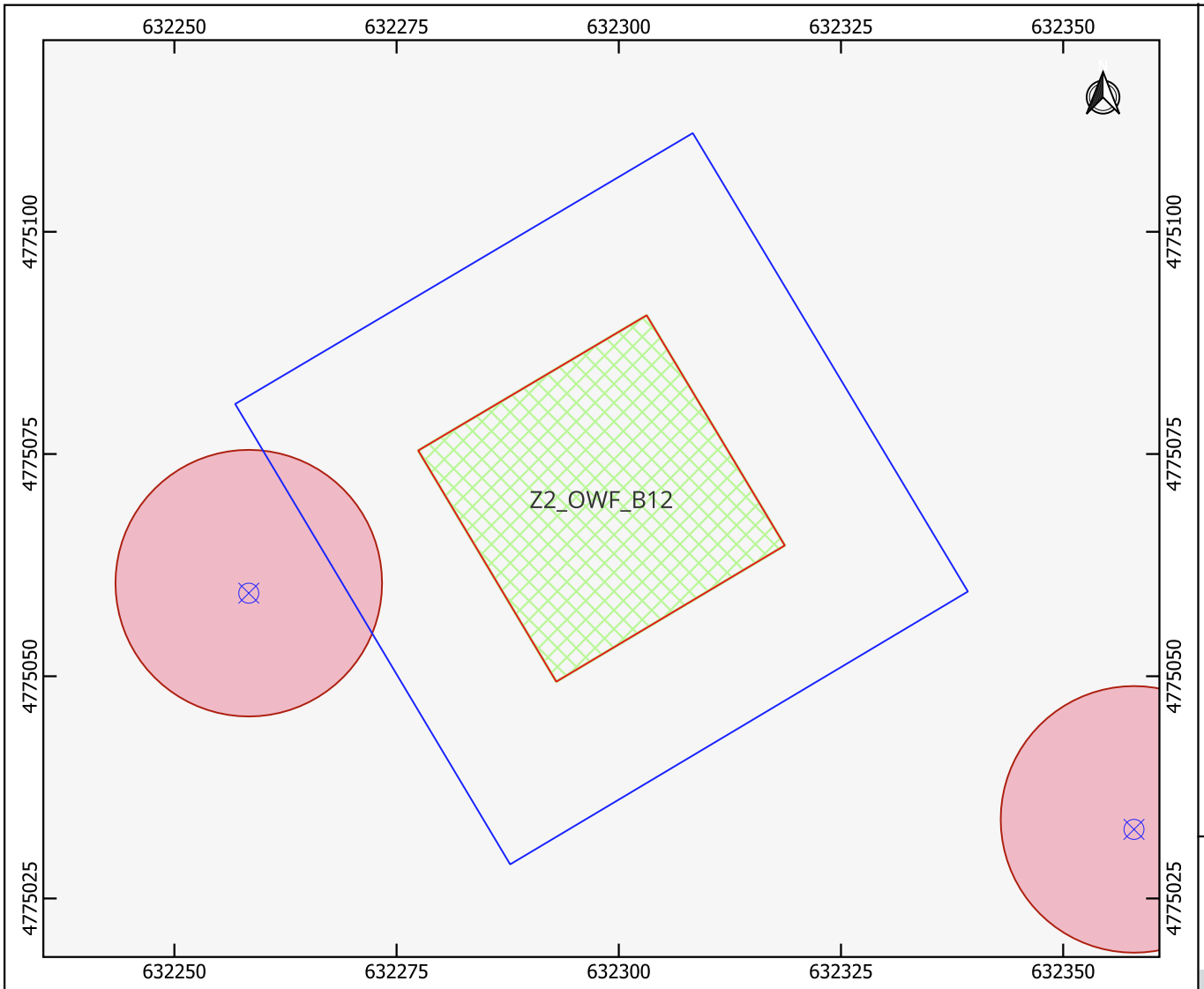
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B12
ALARP CERTIFICATE GIS

Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

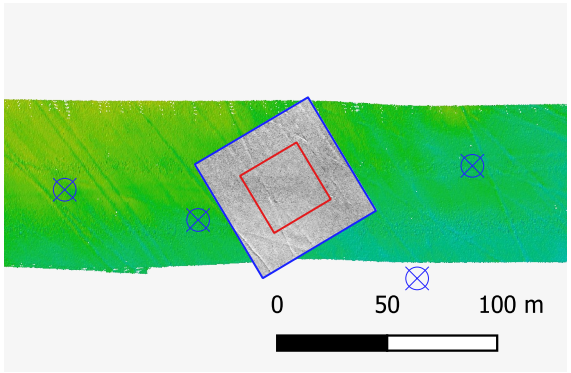
Original Location

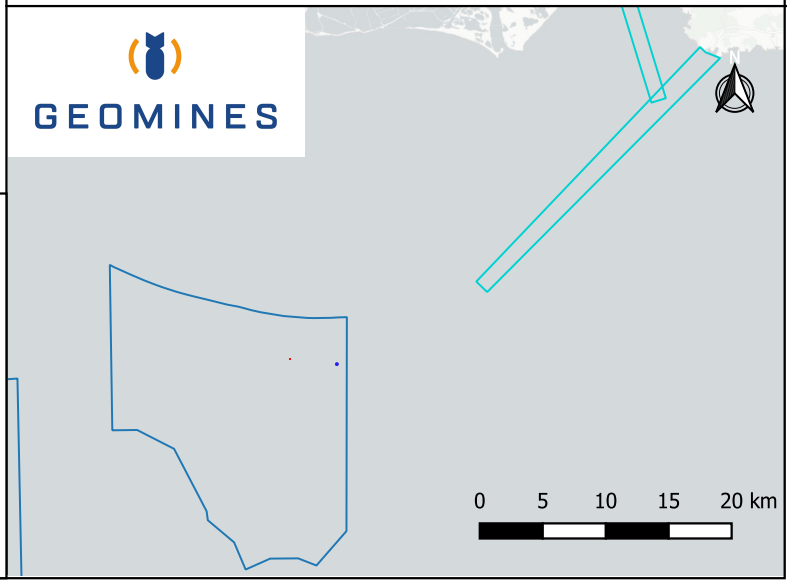
x=632298.036, y=4775070.006

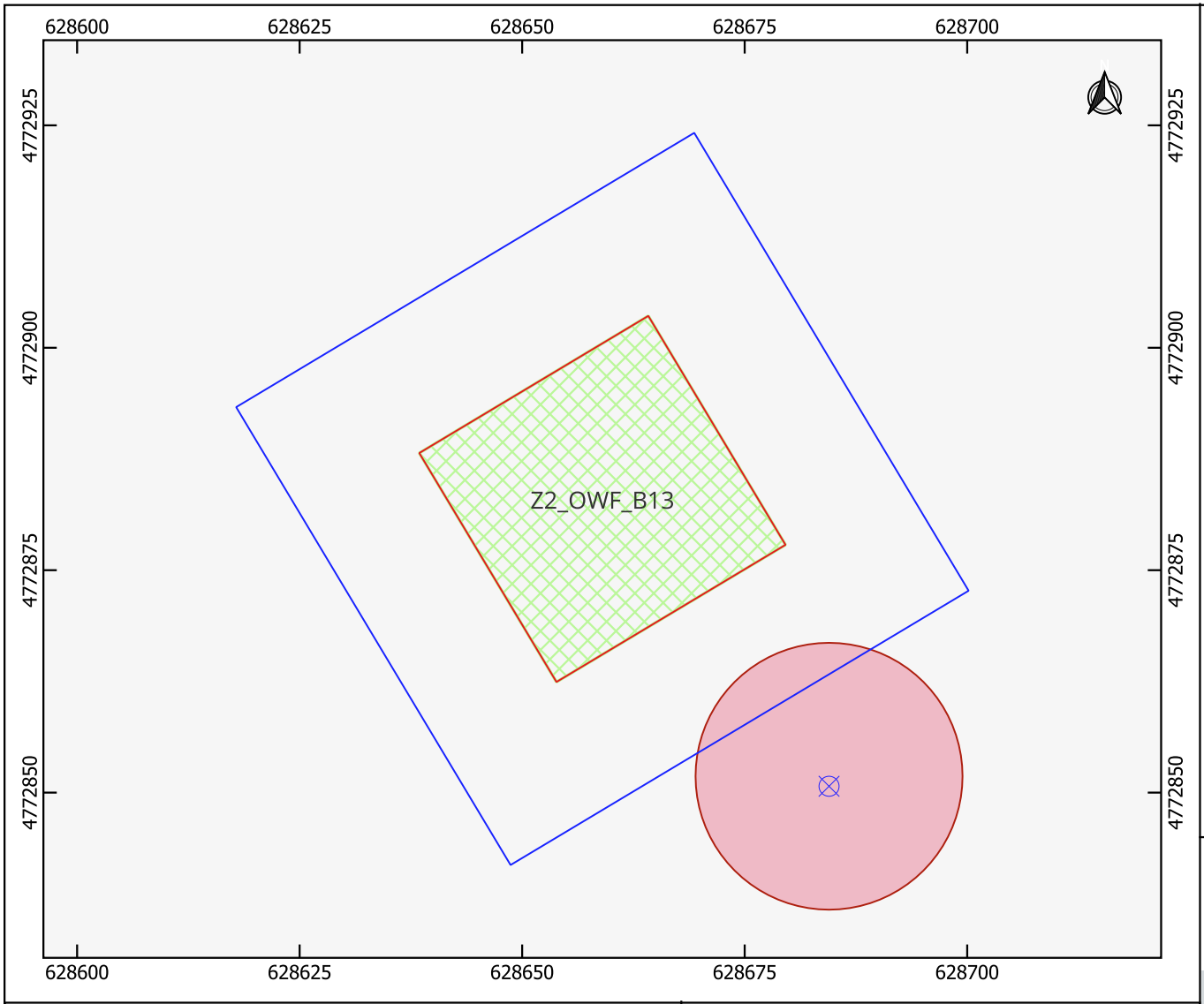
OWF Zone 2
- Geotechnical Boxes OWF zone 2
- Survey extent

Concession
- Zone Parc AO6
- Zone corridors AO6

ALARP
- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B13
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Original Location

x=628659, y=4772883

OWF Zone 2

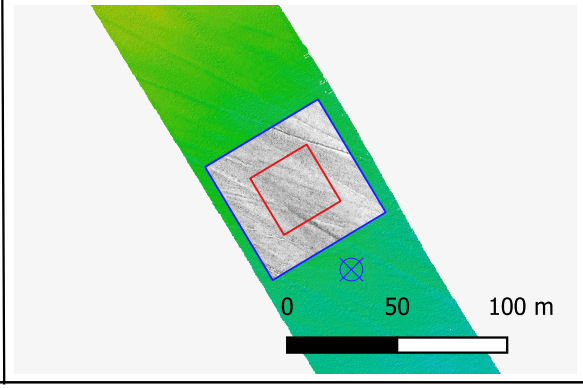
- Geotechnical Boxes OWF zone 2
- Survey extent

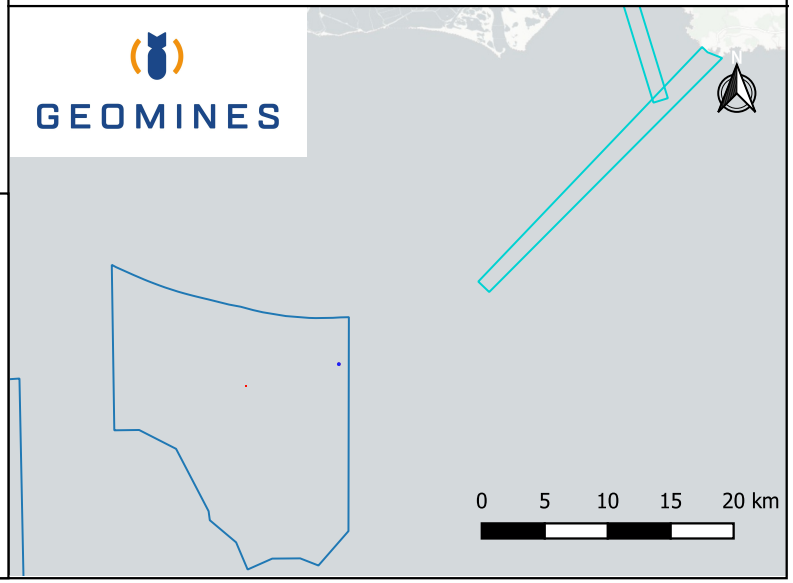
Concession

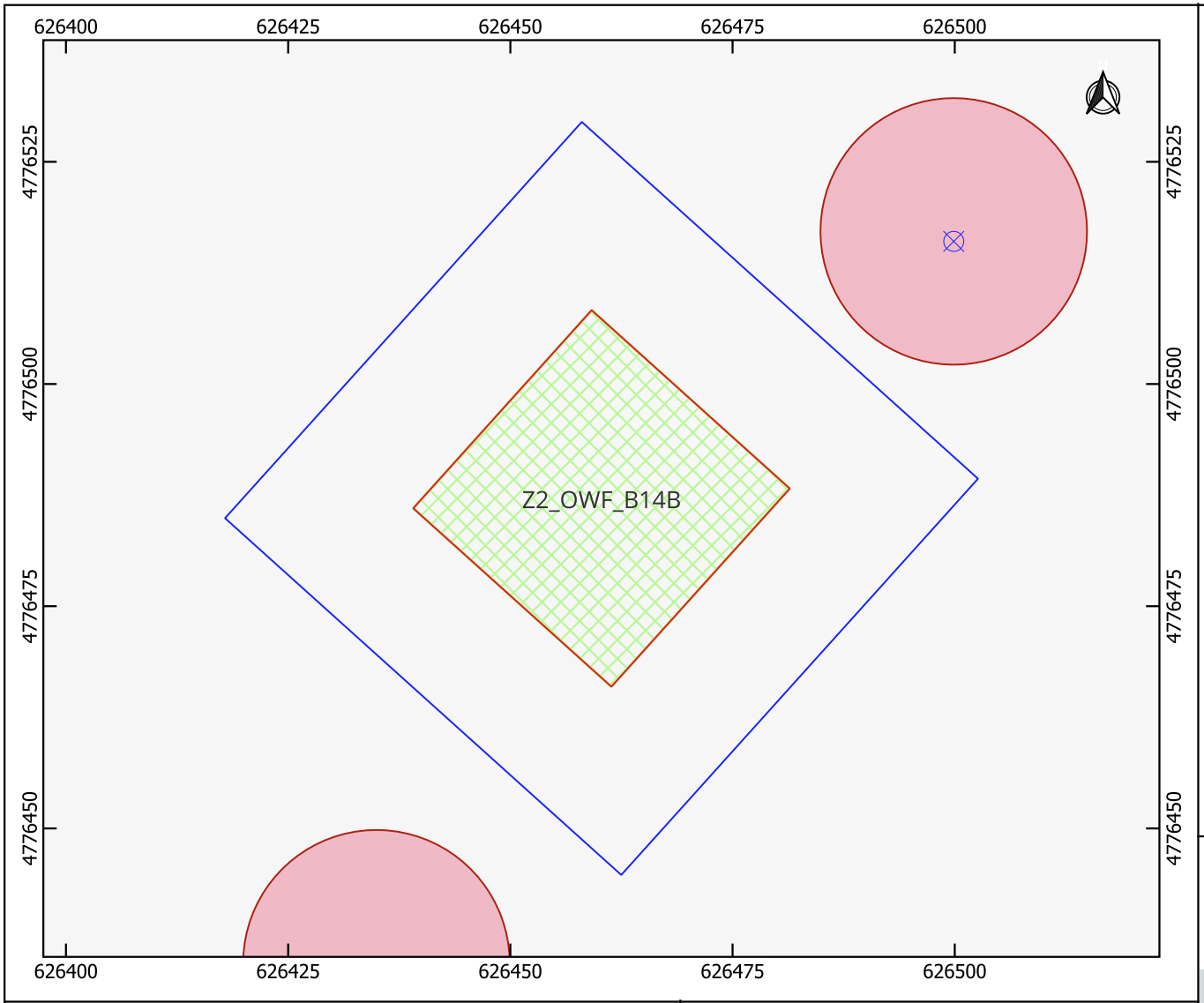
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B14B
ALARP CERTIFICATE GIS

Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

Alternate Location

x=4776487.117, y=4776487.117

OWF Zone 2

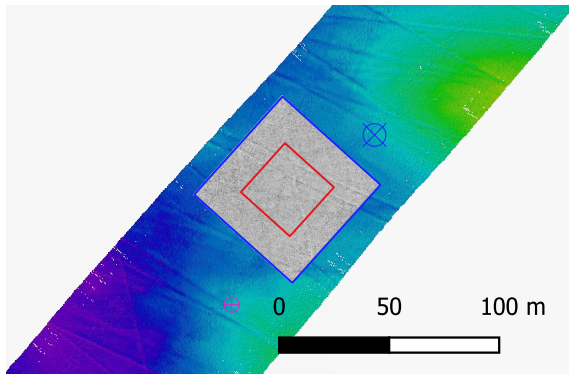
- Geotechnical Boxes OWF zone 2
- Survey extent

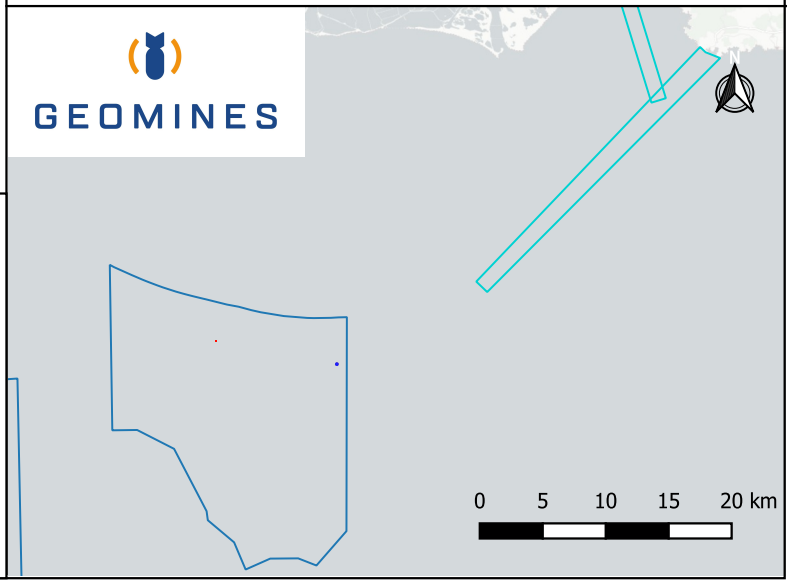
Concession

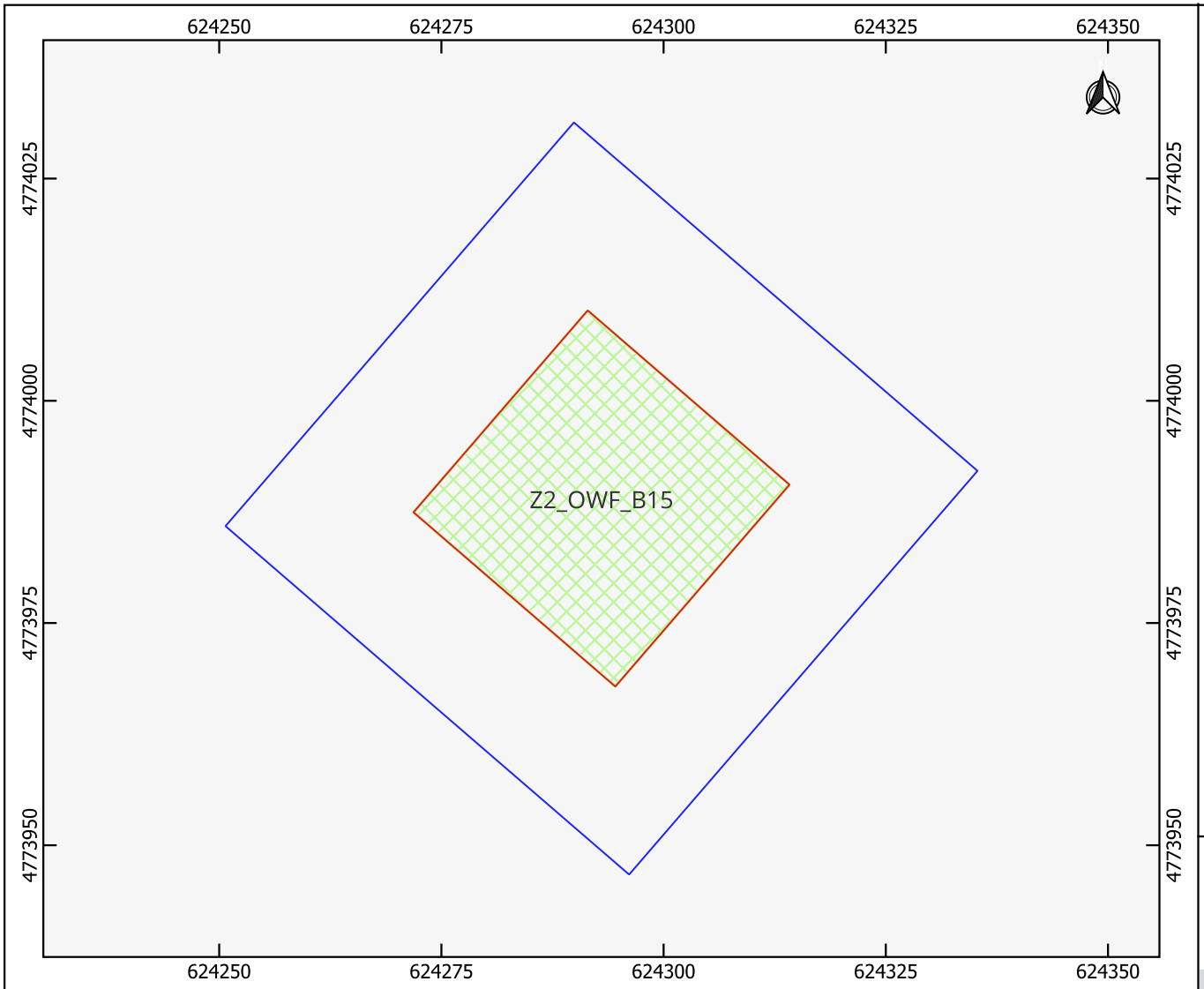
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







TECNOAMBIENTE
A TRADEBE COMPANY

MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE

FUGRO

ANNEXE A: AO6_Z2_OWF_B15
ALARP CERTIFICATE GIS

Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

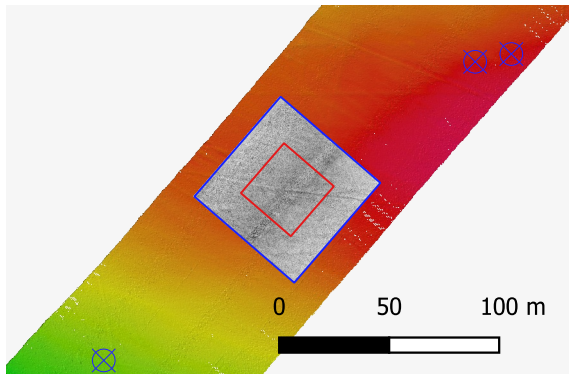
Original Location

x=624293, y=4773989

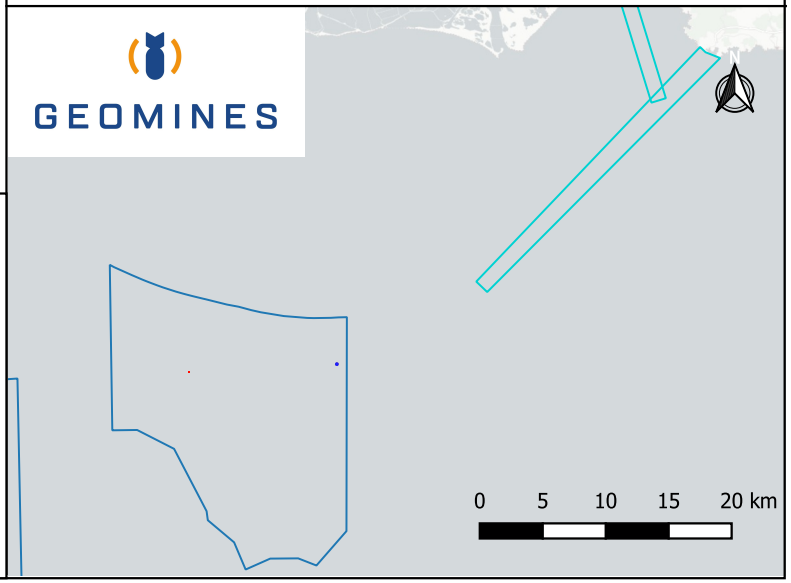
OWF Zone 2
- Geotechnical Boxes OWF zone 2
- Survey extent

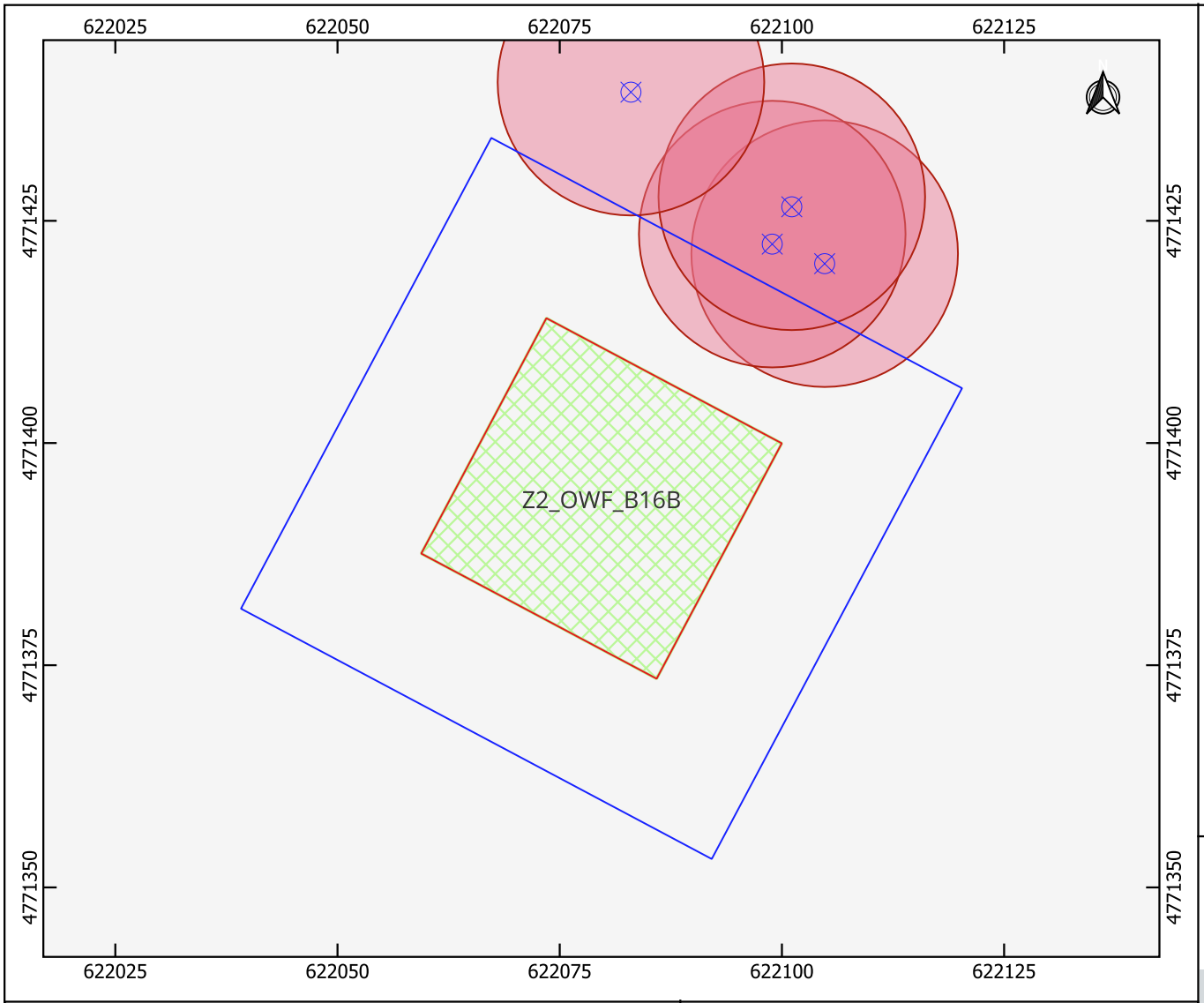
Concession
- Zone Parc AO6
- Zone corridors AO6

ALARP
- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance



GEOMINES





TECNOAMBIENTE
A TRADEBE COMPANY

MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE

FUGRO

ANNEXE A: AO6_Z2_OWF_B16B
ALARP CERTIFICATE GIS

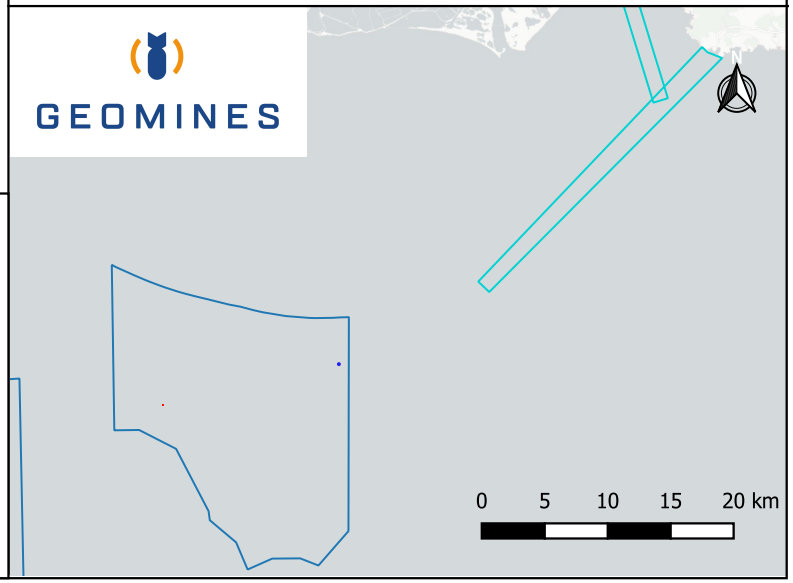
Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

Alternate Location

x=4771393.756, y=4771393.756

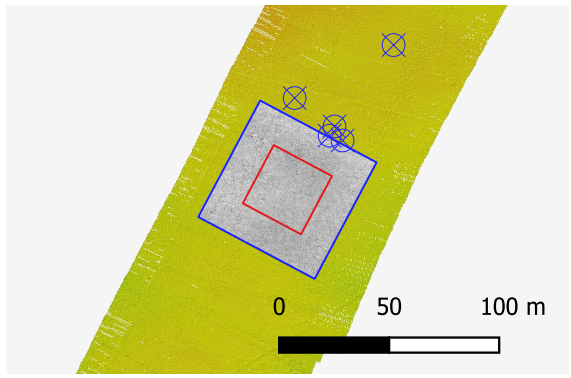
GEOMINES

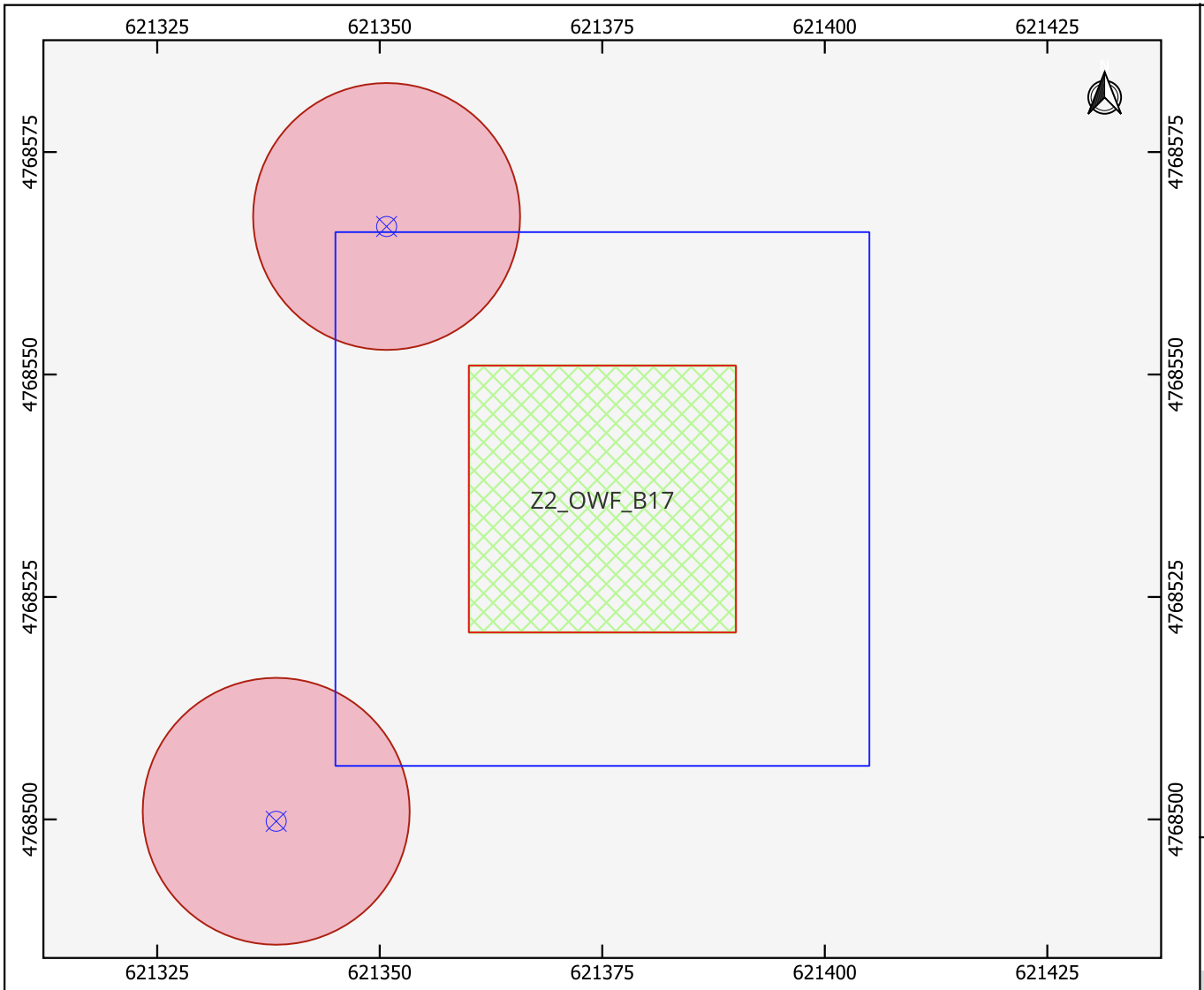


OWF Zone 2
- Geotechnical Boxes OWF zone 2
- Survey extent

Concession
- Zone Parc AO6
- Zone corridors AO6

ALARP
- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance





ANNEXE A: AO6_Z2_OWF_B17
ALARP CERTIFICATE GIS

Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

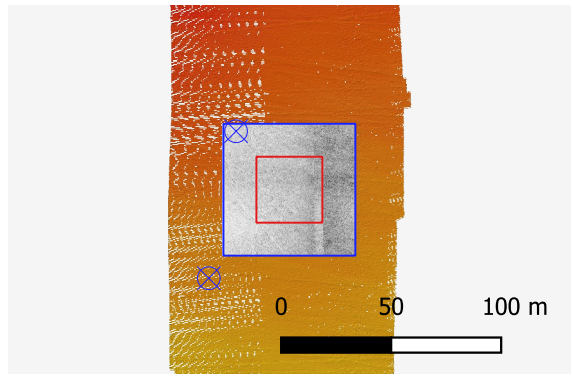
Original Location

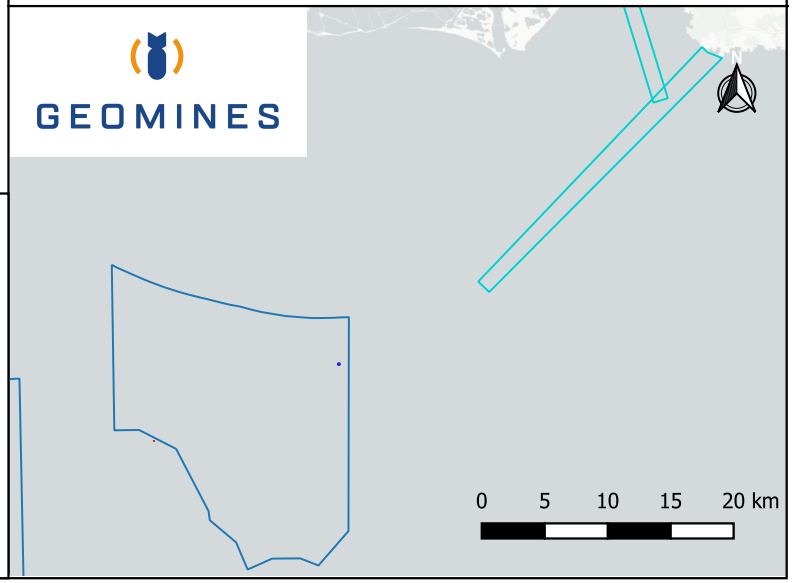
x=621375, y=4768536

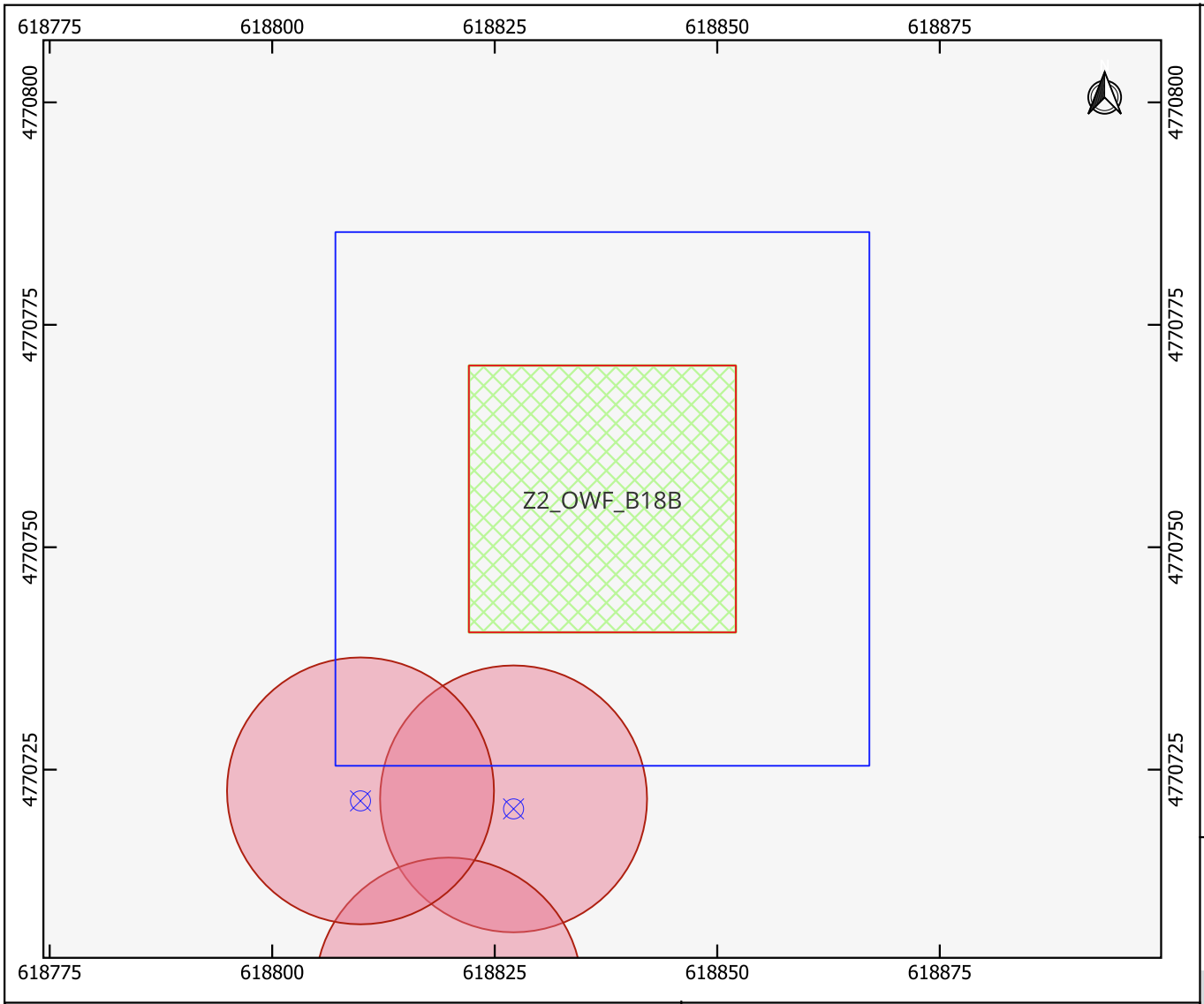
OWF Zone 2
- Geotechnical Boxes OWF zone 2
- Survey extent

Concession
- Zone Parc AO6
- Zone corridors AO6

ALARP
- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B18B
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Alternate Location

x=4770755.419, y=4770755.419

OWF Zone 2

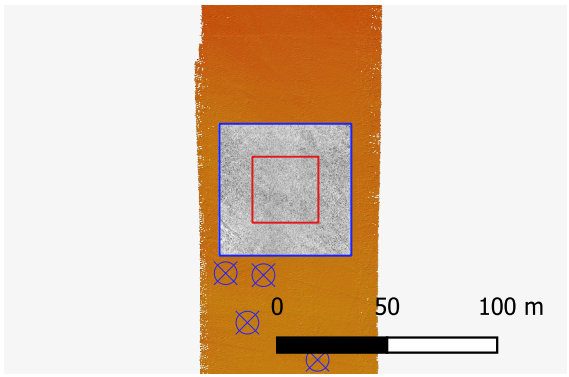
- Geotechnical Boxes OWF zone 2
- Survey extent

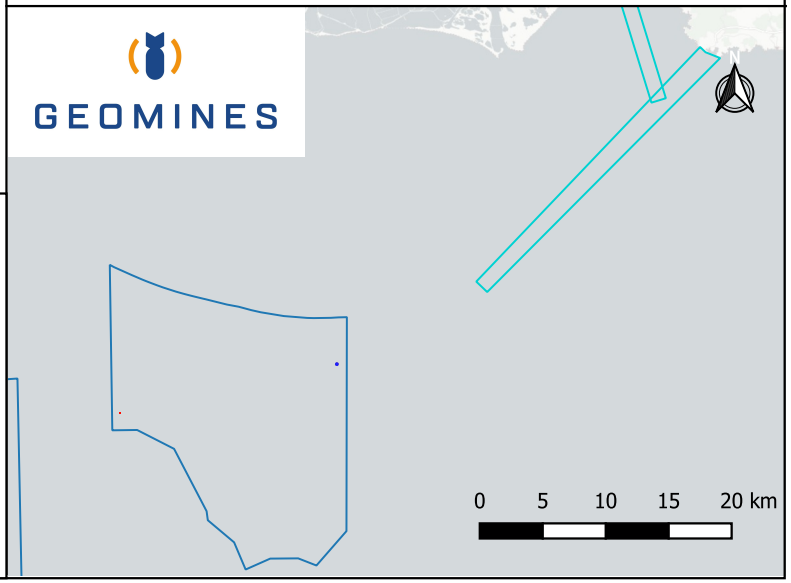
Concession

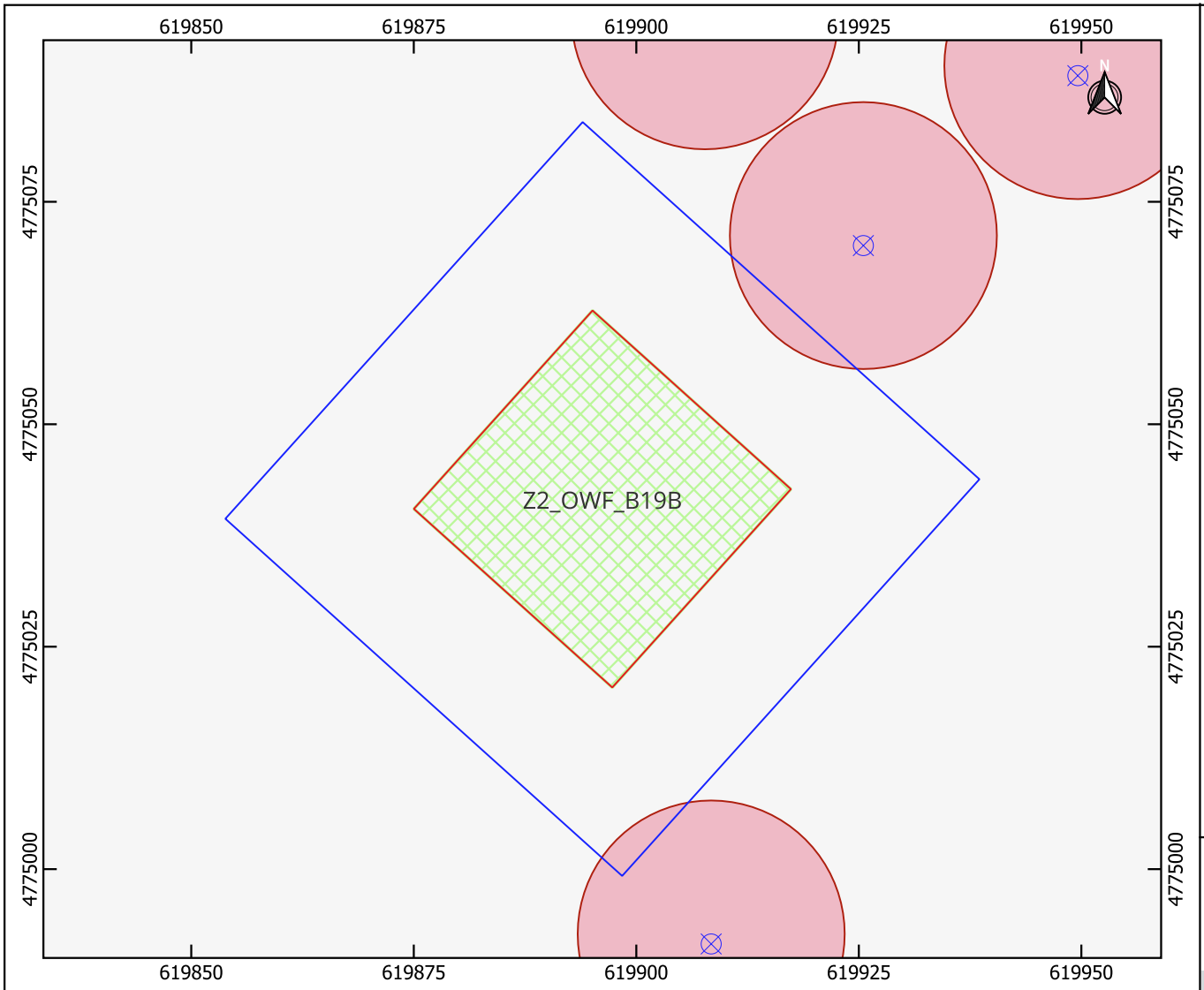
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B19B
ALARP CERTIFICATE GIS

Scale: 1/750 Date: 2023-03-16

Geodesy : WGS 84 - UTM 31N Version: V0

0 10 20 30 40 m

Alternate Location

x=4775041.589, y=4775041.589

OWF Zone 2

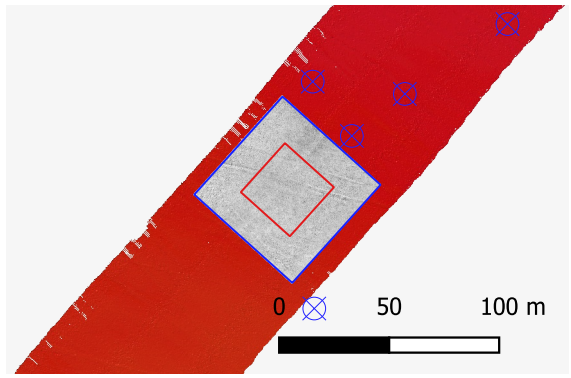
- Geotechnical Boxes OWF zone 2
- Survey extent

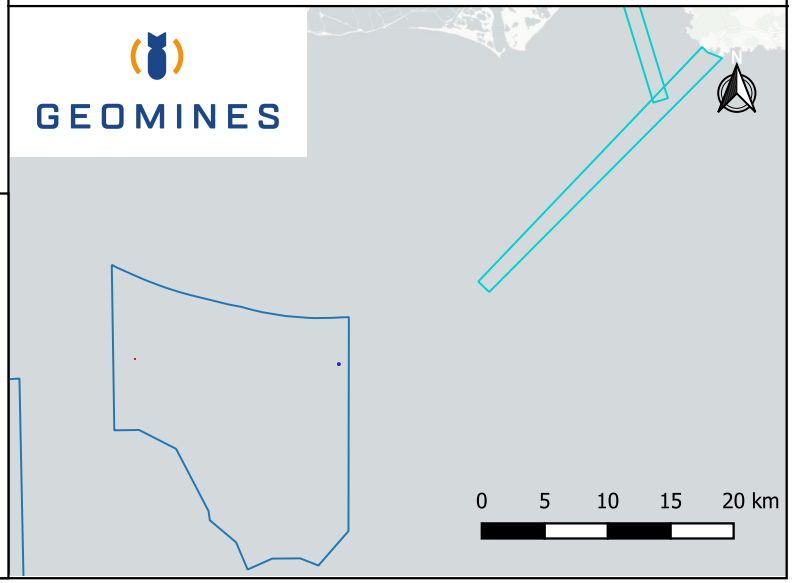
Concession

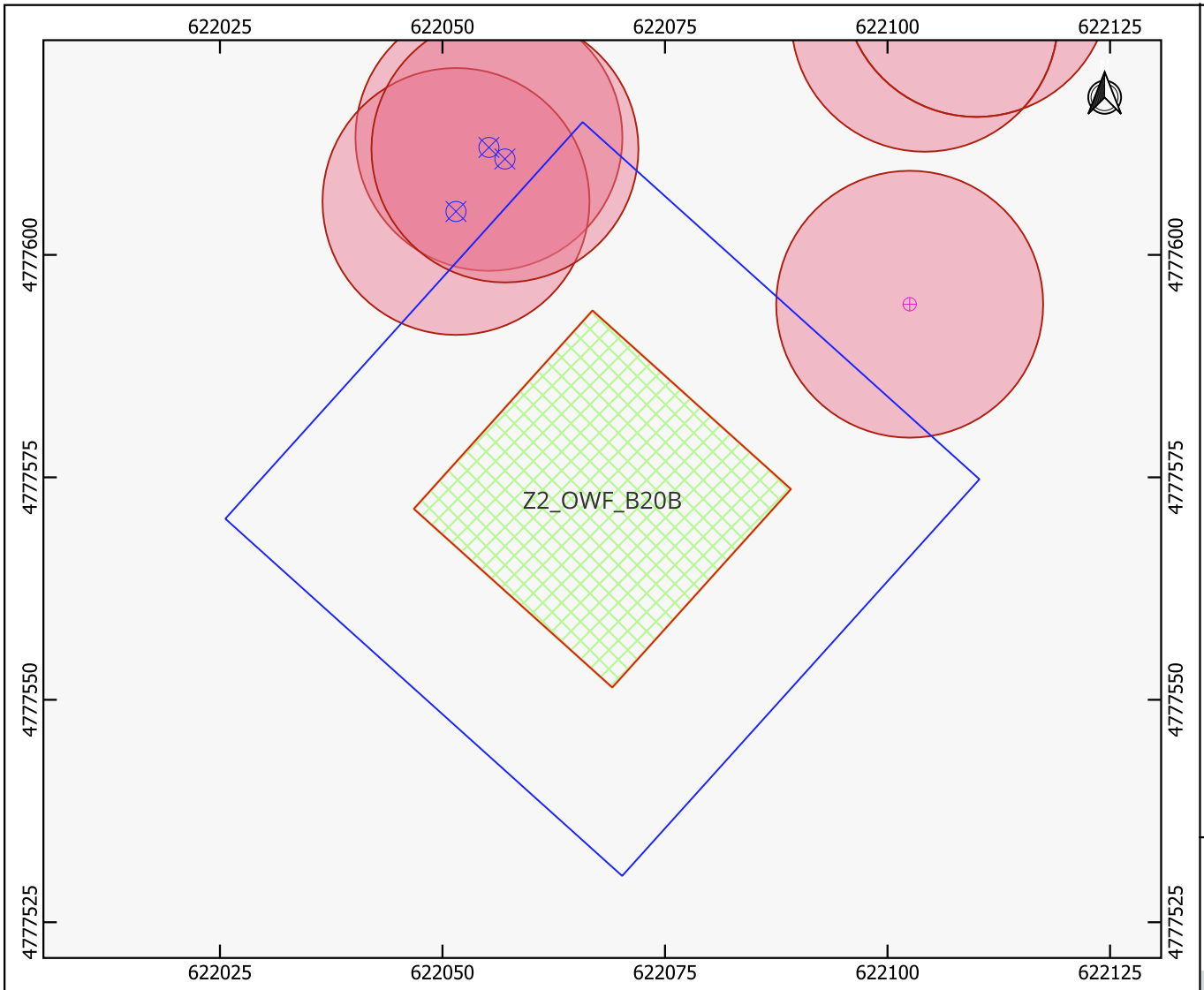
- Zone Parc AO6
- Zone corridors AO6

ALARP

- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance







ANNEXE A: AO6_Z2_OWF_B20B ALARP CERTIFICATE GIS

Scale: 1/750
Date: 2023-03-16
Geodesy : WGS 84 - UTM 31N
Version: V0

0 10 20 30 40 m

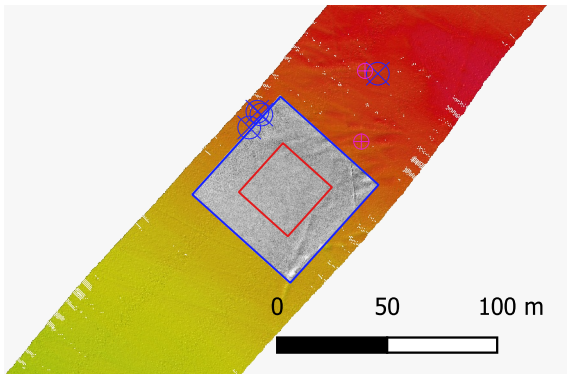
Alternate Location

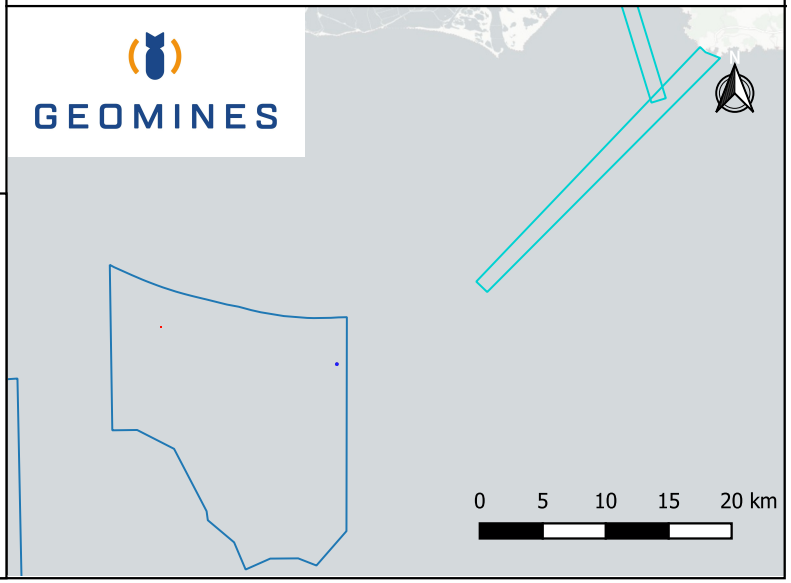
x=4777572.556, y=4777572.556

OWF Zone 2
- Geotechnical Boxes OWF zone 2
- Survey extent

Concession
- Zone Parc AO6
- Zone corridors AO6

ALARP
- AO6_Z2_OWF_SSS_targets
- AO6_Z2_OWF_SBP_targets
- AO6_Z2_OWF_ALARP
- AO6_Z2_OWF_avoidance





APPENDIX II – TARGET LIST

SIDE SCAN SONAR TARGETS

#	Name	X	Y
1	AO6_Z2_OWF_0241	637610.94	4769601.85
2	AO6_Z2_OWF_0242	637620.51	4769548.37
3	AO6_Z2_OWF_0243	637602.24	4769553.25
4	AO6_Z2_OWF_0244	637587.34	4769535.68
5	AO6_Z2_OWF_0245	637373.16	4769464.30
6	AO6_Z2_OWF_0246	637135.47	4769259.83
7	AO6_Z2_OWF_0247	637044.49	4769261.57
8	AO6_Z2_OWF_0248	637005.24	4769181.35
9	AO6_Z2_OWF_0249	636808.42	4769113.51
10	AO6_Z2_OWF_0250	636800.10	4769117.32
11	AO6_Z2_OWF_0251	636700.74	4769060.96
12	AO6_Z2_OWF_0252	636753.82	4769080.15
13	AO6_Z2_OWF_0253	636751.71	4769080.78
14	AO6_Z2_OWF_0254	633020.55	4767630.40
15	AO6_Z2_OWF_0255	633113.14	4767553.10
16	AO6_Z2_OWF_0256	633143.50	4767524.79
17	AO6_Z2_OWF_0257	633181.88	4767443.90
18	AO6_Z2_OWF_0258	633502.17	4766924.03
19	AO6_Z2_OWF_0259	634416.86	4765482.47
20	AO6_Z2_OWF_0260	634376.86	4765436.99
21	AO6_Z2_OWF_0261	634510.07	4765241.69
22	AO6_Z2_OWF_0262	634499.83	4765146.77
23	AO6_Z2_OWF_0263	635094.22	4762574.34
24	AO6_Z2_OWF_0264	635158.33	4762128.77
25	AO6_Z2_OWF_0265	635247.80	4761919.53
26	AO6_Z2_OWF_0266	635287.59	4761716.34
27	AO6_Z2_OWF_0267	635215.79	4761700.81
28	AO6_Z2_OWF_0268	634641.30	4764694.23
29	AO6_Z2_OWF_0269	634506.72	4765030.69
30	AO6_Z2_OWF_0270	634370.64	4765386.92
31	AO6_Z2_OWF_0271	633720.89	4766516.75
32	AO6_Z2_OWF_0275	633634.79	4766559.55
33	AO6_Z2_OWF_0277	633592.72	4766632.67
34	AO6_Z2_OWF_0283	633330.89	4767148.50
35	AO6_Z2_OWF_0288	633176.34	4767300.24
36	AO6_Z2_OWF_0291	633161.30	4767326.32
37	AO6_Z2_OWF_0298	633067.77	4767627.14

#	Name	X	Y
38	AO6_Z2_OWF_0301	633092.86	4767589.81
39	AO6_Z2_OWF_0303	633226.23	4767362.29
40	AO6_Z2_OWF_0306	633206.43	4767304.84
41	AO6_Z2_OWF_0307	633269.77	4767289.36
42	AO6_Z2_OWF_0310	633304.15	4767123.15
43	AO6_Z2_OWF_0313	633388.49	4767088.76
44	AO6_Z2_OWF_0314	633429.12	4767011.34
45	AO6_Z2_OWF_0319	634177.53	4765917.46
46	AO6_Z2_OWF_0322	634343.29	4765486.39
47	AO6_Z2_OWF_0323	634348.40	4765476.09
48	AO6_Z2_OWF_0325	634431.56	4765405.49
49	AO6_Z2_OWF_0331	634506.32	4765238.95
50	AO6_Z2_OWF_0342	635036.49	4762545.14
51	AO6_Z2_OWF_0343	635038.52	4762519.16
52	AO6_Z2_OWF_0345	635046.10	4762475.38
53	AO6_Z2_OWF_0346	635112.93	4762433.90
54	AO6_Z2_OWF_0349	635088.15	4762312.34
55	AO6_Z2_OWF_0350	635092.81	4762307.52
56	AO6_Z2_OWF_0352	635175.89	4762155.29
57	AO6_Z2_OWF_0356	635258.79	4761778.78
58	AO6_Z2_OWF_0359	630383.64	4759653.63
59	AO6_Z2_OWF_0361	630371.55	4759668.43
60	AO6_Z2_OWF_0364	630093.46	4760162.06
61	AO6_Z2_OWF_0365	629991.49	4760324.79
62	AO6_Z2_OWF_0370	629241.03	4761384.84
63	AO6_Z2_OWF_0372	629267.15	4761456.32
64	AO6_Z2_OWF_0375	629168.78	4761549.11
65	AO6_Z2_OWF_0377	629161.28	4761697.15
66	AO6_Z2_OWF_0378	629077.46	4761775.06
67	AO6_Z2_OWF_0387	628433.97	4764541.36
68	AO6_Z2_OWF_0388	628384.87	4764748.45
69	AO6_Z2_OWF_0393	628328.09	4765010.18
70	AO6_Z2_OWF_0394	628328.42	4765065.33
71	AO6_Z2_OWF_0397	628236.32	4765456.98
72	AO6_Z2_OWF_0403	628166.29	4765860.08
73	AO6_Z2_OWF_0404	628180.06	4765820.80
74	AO6_Z2_OWF_0405	628154.41	4765754.82
75	AO6_Z2_OWF_0407	628177.25	4765591.34
76	AO6_Z2_OWF_0410	628277.31	4765394.72

#	Name	X	Y
77	AO6_Z2_OWF_0411	628274.56	4765397.02
78	AO6_Z2_OWF_0412	628278.46	4765395.50
79	AO6_Z2_OWF_0416	628354.02	4765060.91
80	AO6_Z2_OWF_0417	628369.88	4764986.43
81	AO6_Z2_OWF_0421	628805.15	4762560.19
82	AO6_Z2_OWF_0422	628788.93	4762573.41
83	AO6_Z2_OWF_0427	628873.97	4762385.96
84	AO6_Z2_OWF_0429	628980.34	4762116.94
85	AO6_Z2_OWF_0430	629025.81	4761992.40
86	AO6_Z2_OWF_0432	629021.32	4761885.16
87	AO6_Z2_OWF_0434	629118.11	4761773.33
88	AO6_Z2_OWF_0437	629740.37	4760762.77
89	AO6_Z2_OWF_0438	629815.26	4760585.21
90	AO6_Z2_OWF_0439	629875.65	4760591.70
91	AO6_Z2_OWF_0441	630119.91	4760185.73
92	AO6_Z2_OWF_0442	630102.92	4760108.74
93	AO6_Z2_OWF_0445	630219.69	4759871.43
94	AO6_Z2_OWF_0561	623663.14	4766075.85
95	AO6_Z2_OWF_0562	623693.81	4766042.55
96	AO6_Z2_OWF_0564	623675.16	4766096.83
97	AO6_Z2_OWF_0566	623752.43	4766186.93
98	AO6_Z2_OWF_0569	625751.46	4768694.97
99	AO6_Z2_OWF_0573	626297.59	4768973.98
100	AO6_Z2_OWF_0574	626305.93	4768971.33
101	AO6_Z2_OWF_0577	632204.82	4770259.99
102	AO6_Z2_OWF_0581	632350.73	4770290.02
103	AO6_Z2_OWF_0587	632547.63	4770328.14
104	AO6_Z2_OWF_0591	633000.46	4770372.29
105	AO6_Z2_OWF_0599	632516.44	4770313.94
106	AO6_Z2_OWF_0600	632500.21	4770326.95
107	AO6_Z2_OWF_0602	632364.36	4770285.66
108	AO6_Z2_OWF_0604	629074.37	4769592.72
109	AO6_Z2_OWF_0612	623983.15	4766380.10
110	AO6_Z2_OWF_0613	623604.97	4766052.71
111	AO6_Z2_OWF_0614	623614.07	4766054.98
112	AO6_Z2_OWF_0616	623683.86	4766139.40
113	AO6_Z2_OWF_0621	623928.52	4766427.78
114	AO6_Z2_OWF_0624	625908.89	4768763.10
115	AO6_Z2_OWF_0625	629094.96	4769611.91

#	Name	X	Y
116	AO6_Z2_OWF_0626	632854.94	4770409.16
117	AO6_Z2_OWF_0627	633013.60	4770454.07
118	AO6_Z2_OWF_0628	632524.83	4775028.30
119	AO6_Z2_OWF_0629	632357.96	4775033.88
120	AO6_Z2_OWF_0630	632197.67	4775074.22
121	AO6_Z2_OWF_0631	632039.81	4775086.14
122	AO6_Z2_OWF_0632	632383.08	4775085.10
123	AO6_Z2_OWF_0633	632648.75	4775085.88
124	AO6_Z2_OWF_0634	632640.62	4775105.98
125	AO6_Z2_OWF_0635	632258.35	4775060.46
126	AO6_Z2_OWF_0636	628473.46	4773253.22
127	AO6_Z2_OWF_0637	628765.61	4772752.28
128	AO6_Z2_OWF_0638	628708.49	4772781.98
129	AO6_Z2_OWF_0639	628559.71	4772969.62
130	AO6_Z2_OWF_0640	628684.47	4772851.82
131	AO6_Z2_OWF_0641	628797.88	4772565.06
132	AO6_Z2_OWF_0471	626667.43	4776669.43
133	AO6_Z2_OWF_0473	626595.53	4776587.83
134	AO6_Z2_OWF_0480	624394.86	4774055.86
135	AO6_Z2_OWF_0483	624209.47	4773916.50
136	AO6_Z2_OWF_0484	624070.77	4773752.33
137	AO6_Z2_OWF_0489	622276.60	4771714.54
138	AO6_Z2_OWF_0491	622261.52	4771677.11
139	AO6_Z2_OWF_0492	622255.00	4771659.12
140	AO6_Z2_OWF_0495	622135.30	4771531.71
141	AO6_Z2_OWF_0501	621410.86	4768852.10
142	AO6_Z2_OWF_0508	626565.28	4776587.07
143	AO6_Z2_OWF_0509	626499.88	4776517.17
144	AO6_Z2_OWF_0512	624534.18	4774263.62
145	AO6_Z2_OWF_0514	624450.32	4774160.90
146	AO6_Z2_OWF_0515	624285.66	4773973.73
147	AO6_Z2_OWF_0517	622178.09	4771565.47
148	AO6_Z2_OWF_0518	622111.94	4771554.03
149	AO6_Z2_OWF_0520	622106.92	4771540.87
150	AO6_Z2_OWF_0524	621957.89	4771229.75
151	AO6_Z2_OWF_0525	621939.01	4771222.11
152	AO6_Z2_OWF_0528	621330.77	4768721.38
153	AO6_Z2_OWF_0532	621338.34	4768500.90
154	AO6_Z2_OWF_0534	621338.15	4768356.13

#	Name	X	Y
155	AO6_Z2_OWF_0536	621386.78	4768151.65
156	AO6_Z2_OWF_0537	621353.85	4768090.07
157	AO6_Z2_OWF_0538	621350.92	4768162.51
158	AO6_Z2_OWF_0539	621348.57	4768209.83
159	AO6_Z2_OWF_0540	621350.75	4768567.76
160	AO6_Z2_OWF_0544	621951.18	4771088.64
161	AO6_Z2_OWF_0547	621965.50	4771222.76
162	AO6_Z2_OWF_0550	622200.08	4771666.32
163	AO6_Z2_OWF_0551	624038.87	4773723.41
164	AO6_Z2_OWF_0553	624146.95	4773834.30
165	AO6_Z2_OWF_0554	624165.47	4773881.36
166	AO6_Z2_OWF_0555	624378.38	4774052.34
167	AO6_Z2_OWF_0556	624506.04	4774269.61
168	AO6_Z2_OWF_0560	626355.19	4776394.42
169	AO6_OWF_B18_70	618832.50	4771009.20
170	AO6_OWF_B18_71	618827.10	4770721.70
171	AO6_OWF_B18_72	618830.80	4770647.10
172	AO6_OWF_B18_73	618834.40	4770400.50
173	AO6_OWF_B18_74	618873.00	4770284.90
174	AO6_OWF_B18_75	618808.00	4770421.90
175	AO6_OWF_B18_76	618862.20	4770481.20
176	AO6_OWF_B18_77	618851.70	4770683.20
177	AO6_OWF_B18_78	618819.80	4770700.10
178	AO6_OWF_B18_79	618854.90	4770958.90
179	AO6_OWF_B18_80	618864.30	4770987.70
180	AO6_OWF_B18_81	618814.40	4770907.20
181	AO6_OWF_B18_82	618809.50	4770914.60
182	AO6_OWF_B18_83	618854.20	4770641.50
183	AO6_OWF_B18_84	618802.40	4770420.00
184	AO6_OWF_B18_85	618809.90	4770722.60
185	AO6_OWF_B19_1	620134.80	4775319.90
186	AO6_OWF_B19_2	620173.80	4775296.30
187	AO6_OWF_B19_3	620034.60	4775207.70
188	AO6_OWF_B19_4	620027.80	4775124.30
189	AO6_OWF_B19_5	619925.50	4775071.20
190	AO6_OWF_B19_6	619908.40	4774992.70
191	AO6_OWF_B19_7	619777.20	4774843.00
192	AO6_OWF_B19_8	619713.50	4774778.00
193	AO6_OWF_B19_9	619680.50	4774729.60

#	Name	X	Y
194	AO6_OWF_B19_10	619711.80	4774806.20
195	AO6_OWF_B19_11	619996.30	4775122.10
196	AO6_OWF_B19_12	620035.20	4775240.00
197	AO6_OWF_B19_13	620119.80	4775274.00
198	AO6_OWF_B19_14	620112.90	4775314.60
199	AO6_OWF_B19_15	620138.60	4775369.40
200	AO6_OWF_B19_16	620253.50	4775435.60
201	AO6_OWF_B19_17	620229.30	4775467.80
202	AO6_OWF_B19_18	620158.50	4775339.10
203	AO6_OWF_B19_19	619949.60	4775090.30
204	AO6_OWF_B19_20	619907.70	4775095.90
205	AO6_OWF_B20_21	622325.50	4777878.00
206	AO6_OWF_B20_22	622347.80	4777830.00
207	AO6_OWF_B20_23	622289.10	4777789.90
208	AO6_OWF_B20_24	622241.90	4777792.10
209	AO6_OWF_B20_25	622110.00	4777630.50
210	AO6_OWF_B20_26	622031.00	4777481.80
211	AO6_OWF_B20_27	622026.90	4777462.90
212	AO6_OWF_B20_28	621878.60	4777361.70
213	AO6_OWF_B20_29	621866.50	4777282.50
214	AO6_OWF_B20_30	621857.70	4777317.20
215	AO6_OWF_B20_31	621894.70	4777385.80
216	AO6_OWF_B20_32	622276.10	4777778.60
217	AO6_OWF_B20_33	622351.20	4777887.00
218	AO6_OWF_B20_34	622055.20	4777613.20
219	AO6_OWF_B20_35	622051.50	4777606.00
220	AO6_OWF_B20_36	622057.00	4777611.90
221	AO6_OWF_B02_17	633396.00	4767082.20
222	AO6_OWF_B02_1	633581.80	4766788.60
223	AO6_OWF_B02_2	633541.20	4766847.30
224	AO6_OWF_B02_3	633541.00	4766871.90
225	AO6_OWF_B02_4	633538.30	4766861.50
226	AO6_OWF_B02_5	633380.00	4767057.40
227	AO6_OWF_B02_6	633376.00	4767059.90
228	AO6_OWF_B02_7	633370.00	4767146.50
229	AO6_OWF_B02_8	633235.10	4767288.30
230	AO6_OWF_B02_9	633182.00	4767444.10
231	AO6_OWF_B02_10	633202.40	4767286.10
232	AO6_OWF_B02_11	633373.70	4767000.30

#	Name	X	Y
233	AO6_OWF_B02_12	633539.60	4766823.30
234	AO6_OWF_B02_13	633500.50	4766894.00
235	AO6_OWF_B02_14	633389.30	4766992.60
236	AO6_OWF_B02_15	633216.10	4767283.70
237	AO6_OWF_B02_16	632983.30	4767682.90
238	AO6_OWF_B16_1	621939.00	4771221.70
239	AO6_OWF_B16_2	622104.80	4771421.30
240	AO6_OWF_B16_3	622098.90	4771423.50
241	AO6_OWF_B16_4	622101.10	4771427.70
242	AO6_OWF_B16_5	622128.00	4771464.70
243	AO6_OWF_B16_6	622111.70	4771553.60
244	AO6_OWF_B16_7	622223.10	4771703.60
245	AO6_OWF_B16_8	622209.80	4771669.50
246	AO6_OWF_B16_9	622083.00	4771440.60
247	AO6_OWF_B16_10	621963.50	4771225.00
248	AO6_OWF_B16_11	621949.80	4771086.80
249	AO6_OWF_B16_12	621918.60	4771049.20
250	AO6_OWF_B10_01	629680.90	4769658.30
251	AO6_OWF_B10_2	629667.30	4769694.00
252	AO6_OWF_B10_3	629405.30	4769593.90
253	AO6_OWF_B10_4	629018.30	4769563.50
254	AO6_OWF_B10_5	629149.60	4769606.60
255	AO6_OWF_B10_6	629617.30	4769681.70
256	AO6_OWF_B10_7	629098.00	4769606.80
257	AO6_OWF_B10_8	629075.00	4769594.10

SUB-BOTTOM PROFILER TARGETS

#	NAME	X	Y
1	AO6_Z2_OWF_SBP1	636912.96	4769162.37
2	AO6_Z2_OWF_SBP2	636421.15	4768868.96
3	AO6_Z2_OWF_SBP3	636920.62	4769143.27
4	AO6_Z2_OWF_SBP4	633667.04	4766580.69
5	AO6_Z2_OWF_SBP5	633391.36	4767021.55
6	AO6_Z2_OWF_SBP6	633605.66	4766684.94
7	AO6_Z2_OWF_SBP7	634438.73	4765410.47
8	AO6_Z2_OWF_SBP8	634376.1	4765514.41
9	AO6_Z2_OWF_SBP9	634633.25	4764933.89
10	AO6_Z2_OWF_SBP10	634664.01	4764857.45

#	NAME	X	Y
11	AO6_Z2_OWF_SBP11	635376.41	4761325.63
12	AO6_Z2_OWF_SBP12	635311.34	4761532.57
13	AO6_Z2_OWF_SBP13	630253.52	4759970.34
14	AO6_Z2_OWF_SBP14	630229.85	4760009
15	AO6_Z2_OWF_SBP15	629071.49	4761911.44
16	AO6_Z2_OWF_SBP16	629013.8	4762047.37
17	AO6_Z2_OWF_SBP17	628866.28	4762433.33
18	AO6_Z2_OWF_SBP18	628450.06	4764712.66
19	AO6_Z2_OWF_SBP19	628360.49	4765112.98
20	AO6_Z2_OWF_SBP20	628296.72	4765409.43
21	AO6_Z2_OWF_SBP21	628236.56	4765684.44
22	AO6_Z2_OWF_SBP22	628230.2	4765712.89
23	AO6_Z2_OWF_SBP23	628202.87	4765738.06
24	AO6_Z2_OWF_SBP24	628340.49	4765117.92
25	AO6_Z2_OWF_SBP25	623798.49	4766144.39
26	AO6_Z2_OWF_SBP26	624036.21	4766413.11
27	AO6_Z2_OWF_SBP27	623665.57	4766012.05
28	AO6_Z2_OWF_SBP28	623772.6	4766159.81
29	AO6_Z2_OWF_SBP29	624041.86	4766477.25
30	AO6_Z2_OWF_SBP30	626451.32	4769084.66
31	AO6_Z2_OWF_SBP31	626230.18	4768947.46
32	AO6_Z2_OWF_SBP32	625651.86	4768594.64
33	AO6_Z2_OWF_SBP33	626059.09	4768865.5
34	AO6_Z2_OWF_SBP34	629945.51	4769731.45
35	AO6_Z2_OWF_SBP35	629841.29	4769740.3
36	AO6_Z2_OWF_SBP36	632560.08	4775044.35
37	AO6_Z2_OWF_SBP37	626729.18	4776776.12
38	AO6_Z2_OWF_SBP38	626434.91	4776434.81
39	AO6_Z2_OWF_SBP39	626382.22	4776375.4
40	AO6_Z2_OWF_SBP40	626197.85	4776163.22
41	AO6_Z2_OWF_SBP41	626109.47	4776064.04
42	AO6_Z2_OWF_SBP42	626236.88	4776208.29
43	AO6_Z2_OWF_SBP43	623921.87	4773584.63
44	AO6_Z2_OWF_SBP44	624058.82	4773710.02
45	AO6_Z2_OWF_SBP45	624625.46	4774358.52
46	AO6_Z2_OWF_SBP46	624527.6	4774242.83
47	AO6_Z2_OWF_SBP47	624520.91	4774235.66
48	AO6_Z2_OWF_SBP48	624223.5	4773883.3
49	AO6_Z2_OWF_SBP49	624072.78	4773706.29

#	NAME	X	Y
50	AO6_Z2_OWF_SBP50	623929.75	4773537.2
51	AO6_Z2_OWF_SBP51	621414.12	4768170.2
52	AO6_Z2_OWF_SBP52	621416.38	4767869.2
53	AO6_Z2_OWF_SBP53	618867.77	4770424.61
54	AO6_Z2_OWF_SBP54	618850.41	4770551.92
55	AO6_Z2_OWF_SBP55	622102.48	4777594.45
56	AO6_Z2_OWF_SBP56	622411.24	4777979.08
57	AO6_Z2_OWF_SBP57	622180.43	4777709.84
58	AO6_Z2_OWF_SBP58	622104.16	4777626.59
59	AO6_Z2_OWF_SBP59	621927.85	4777413.67
60	AO6_Z2_OWF_SBP60	621909.5	4777393.22