D. I2.4.1. TERMS OF REFERENCE FOR THE SITE WORKS ON POMPEY SITE (FR)

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SUMMARY

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3 INTRODUCTION

Pompey is one of the three pilot sites of the NWE-REGENERATIS project. It is a former tailing pond owned by the EPFGE (Etablissement Public Foncier de Grand Est, Public Real-Estate Company of Grand Est region). The site has been chosen for two main reasons: (1) it hosted various activities for iron based alloys production; (2) it was just rehabilitated on surface, and historic documentation and investigations are done with respect of the French legislation and threshold values. One of the interest of this site is that it allows testing the NWE-REGENERATIS methodologies developed within WPT1 and WPT2 on a site that has already been remediated.

Site works provided access to material to perform lab trials and also allowed on-site geophysical measurements.

This report contains general description of the area dedicated to the actual conditions on site. It does not include the extraction campaign description and production of eco-catalysts since these activities have not been developed on site.

4 PRESENTATION OF THE POMPEY SITE

The Pompey site is a former tailing pond from the iron and steel complex of Pompey-Frouard-Custines, located 10 km North from Nancy. The steel complex was active from 1870 to 1986. It is renowned for producing cast iron and special steels, such as ferromanganese (ferro-alloy rich in manganese). The last blast furnace of the Pompey-Frouard-Custines iron and steel complex was stopped in 1986. Over time, a forest ecosystem developed on the former tailing pond. The dike delimiting the site was planted with a curtain of black locust trees in 1997. The rest of the pond gradually got covered with diversified deciduous vegetation, more or less dense depending on the area.

The geological substratum of the former tailing pond consists of the Lias marl formations (at 181 m NGF), which are covered by alluvium from the two rivers, composed of coarse siliceous materials (sands, gravel and pebbles) at the base over 3 to 6 m surmounted by finer materials (sands, silts and clays) on 1 to 3 m. These alluvial formations were locally exploited and backfilled with waste rock and iron and steel by-products.

The depth of the deposits in the basin is estimated at around 10 m. The surface of the former pound is estimated to 26 000 m^2, for a total estimated volume of wastes equal to 260 000 m^3.

The waters of the alluvial table would circulate from the channeled Moselle towards the Meurthe, whose level is lower. The piezometric levels measured in 2002 are 187.5 m NGF upstream (South-West of the island) and 184 m NGF downstream (East of the island). The basin surface varies between 199 and 194.5 m NGF, with a mean altitude at 195 m (ANTEA, 2002) (see Figure 1).

On site work included a two-stages geophysical campaign (see deliverable DI2.2.1) and two sampling campaigns (see deliverable DI2.2.2).

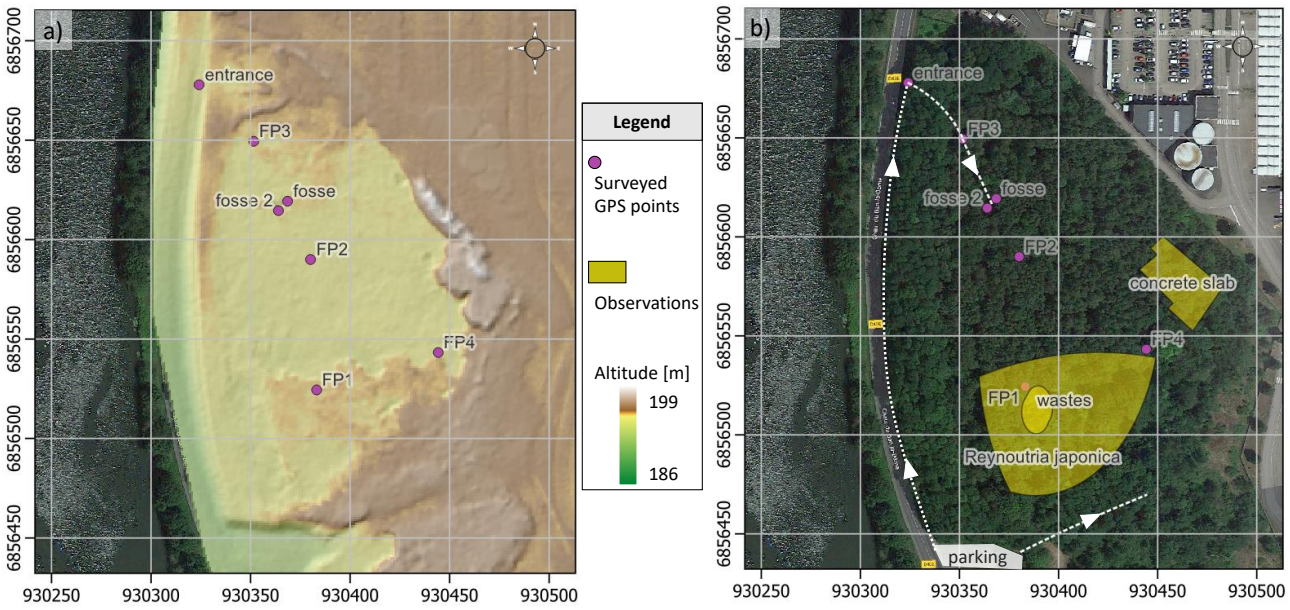

Figure 1: a) Map of the Pompey site altitudes with position of the different sampling locations: b) Localization of identified areas and recommended circulation paths on site from parking location.

5 OBSERVATIONS ON SITE

5.1 IDENTIFIED AREAS

During our field work, several areas were identified with specific features.

Two pits *(see Figure 2) have been dug in 2010 and are still accessible, especially pit 1 that is protected from vegetation falling by a white grid covering the deapest (≤2 m) part of the pit. Pieces of dead trees and growing vegetation can be seen in pit 2 that has been less used over the years. Attention needs to be taken to avoid falling within the pit 2. The easiest access to the pits is through the north entrance (see Figure 1 and*

Table 1)

Concrete blocks and massive metallic bars (see Figure 3) were observed on the south of the site emerging from a mound with higher altitudes than the rest of the site (see Figure 1 and Figure 3). We make the assumption that these wastes were deposited after the closure of the settling pond and the entire Pompey-Frouard metallurgic complex.

Reynoutria japonica (see Figure 4) were observed mostly on the south part of the site (see Figure 1 and Figure 4). This specie, also known as Japanese knotweed or Asian knotweed is classified as a pest and invasive species in several countries in Europe, including France (http://especes-exotiques-envahissantes.fr/espece/reynoutria-x-bohemica/#1460369355223-03a3f531-b8ba). Care needs to be taken when exploring this area to avoid contamination of other parts of the site and outside the pilot site.

A concrete slab was found on the South east corner of the pilot site. It was very hard to plant electrodes in this area during the geophysical investigations. Its location and extend is confirmed both by the elevation map (see Figure 1), and by the geophysical results (see deliverable DI2.2.1).

Location of some of these identified areas are reported on Figure 1 and in

Table 1.

Table 1 : GPS location and altitude (from Digital Elevation Model = MNT) of identified points of interest

Name	Latitude[°]	Longitude[°]	L93_northing[m]	L93_easting[m]	Altitude_MNTqgis[m]		std_Latitude [°]	std_Longitude [°]	std_L93_northing [m]	std_L93_easting [m]
entrance North	48.7690506630	6.1346122490	6856677.86	930324.17	194.30		1.77E-06	9.75E-07	0.20	0.07
pit 1 (fosse)	48.7685089460	6.1351846400	6856619.35	930368.62	194.80		1.34E-05	6.43E-06	1.48	0.52
pit 2 (fosse 2)	48.7684678990	6.1351204330	6856614.60	930364.04	194.70		5.64E-06	6.14E-06	0.64	0.44
FP1	48.7676510230	6.1353320910	6856524.47	930383.21	195.10		4.32E-07	8.91E-07	0.05	0.06
FP2	48.7682411590	6.1353253570	6856590.03	930380.14	194.70		6.82E-06	1.44E-05	0.76	1.05
FP3	48.7687853620	6.1349704600	6856649.43	930351.62	194.90		9.07E-06	3.87E-06	1.02	0.25
FP4	48.7677980940	6.1361717910	6856543.27	930444.27	194.85		4.11E-06	5.51E-06	0.46	0.40

Figure 2 : a) Map of the Pompey site with annotations; b) Picture of the 2 pits dug in 2010. The samples were taken in pit 1, which is still accessible and covered with a white grid to avoid vegetation (and human) falls. Pit 2 is partially covered by fallen trees and vegetation

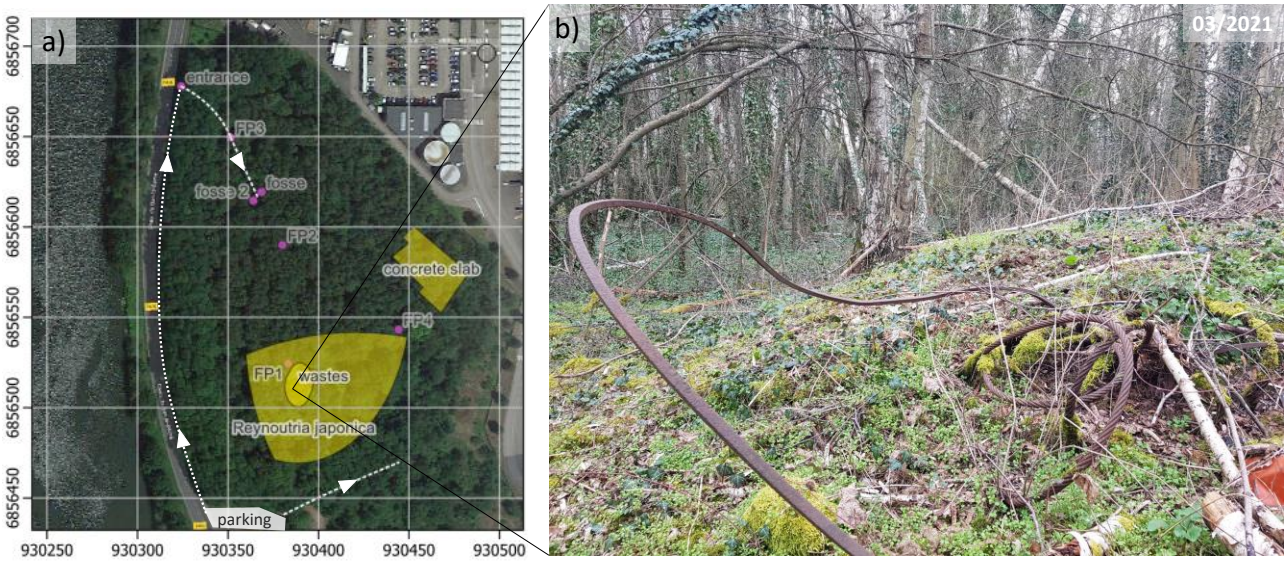

Figure 3 : a) Map of the Pompey site with annotations; b) Picture of metallic bars emerging from the mound located in the south of the site (see a) and Figure 1).

Figure 4 : a) Map of the Pompey site with annotations; b) and c) Picture of the invasive specie "Reynoutria japonica" located mainly in the South of the site (see a) and Figure 1), at different time perioed (November 2020 and June 2023 respectively).

5.2 CIRCULATION ACROSS THE SITE

Entrance on site

The site is covered by dense vegetation, and a dike delimits the area of the site accessible from the road. It is thus difficult to penetrate within the central part of the site. However, two entrances are identified on site, where it is a little easier to access.

On the North side, the dike is lower (see Figure 1). Although the vegetation is still dense, a path can be found, that leads to the location of the borehole FP3, materialized by a blue PVC tubing (see deliverable DI2.4.2), and later to the pit area (see Figure 5). The GPS coordinates of the North entrance are reported in Table 1.

On the South side, a second entrance can be accessed through the parking area (see Figure 5). This entrance is blocked by concrete blocks to avoid the entrance of unwanted vehicles on site. It is possible to access by foot following this path, as the slope is not too steep (see Figure 1).

Figure 5 : a) Map of the Pompey site with annotations; b) Picture of the South entrance of the site, next to the parking lot. The main entrance is blocked by 2 concrete blocks.

Access to the site recommendations

Several risks were identified when accessing the site and working on site, in the state in which it is at the end of the NWE-REGENERATIS project. They are gathered in Table 2 with proposed mitigation measures.

Table 2: Identified risk of circulation across the site and recommended measures to remediate the associated risks.

Identified risks	Associated mitigation measures
Wooded site with diverse vegetation and no access path Presence of ticks Risk of cuts and thorns	Clear an access path to the site by cutting certain plants before the begining of the operations Take a first aid kit
Access to the site along a road with fast traffic	Clear the path on the side of the road before the begining of the operations Materialize a path along the road with tape Provide retro-reflective safety clothes for all the actors
Wooded site and soil polluted with heavy metals	Provide personal protective equipment for everyone: - helmets and cap - gloves - white chemical hazard suits
Risk of perforation or contamination of shoes	Ask participants of the operations in advance to bring their safety shoes Provide a boot rinse or shoe rinse (carpet and container with water) at the exit of the site
Risk of falling into the soil pit	Provide a safety zone around the pit with tape marking

Circulation recommendations

In the state in which the site is at the end of the NWE-REGENERATIS project, circulation on the site is only possible by foot, or using a light transportation mode.

As an example, a light core drill on crawler was used to drill the 4 boreholes on site (see Figure 6 a, b and c). A Light crawler wheelbarrow was used to carry the heavy geophysical equipment on site (see Figure 6 d). These tools allow sufficient lift on the Pompey soils that have poor bearing capacity (see deliverable DI2.3.1 and ANTEA, 2001a, 2001b). Indeed, the soils are delicate to excavate and sensitive to water, which require the use of suitable equipment.

Figure 6 : a), b) and c) light core drill used on site to dig the 4 boreholes FP1 to FP4. d) Light crawler wheelbarrow used to carry geophysical material (batteries and cables) on site; e) Geophysical tool used on site carried out manually at the North entrance of the site (see Figure 1).

6 CONCLUSIONS

During the NWE-REGENERATIS field work, several areas were identified with specific features:

- two pits are still accessible on the northern part of the site. They allow the access to the first 2m of soil for potential sampling.
- Concrete blocks and massive metallic bars were observed on the south of the site emerging from a mound and might have been deposit after the closure of the area as settling pond.
- Japanese knotweed, classified as a pest and invasive specie was identified on the south of the site. Care needs to be taken when exploring this area to avoid contamination of other parts of the site and outside the pilot site.
- a concrete slab was identified on the western part of the site

The site is covered by dense vegetation, and a dike delimits the area of the site accessible from the road. It is thus difficult to penetrate within the central part of the site. However, two entrances are identified on site, where it is a little easier to access: one in the north and one in the south.

Because of the vegetation, and the nature of the soils that have poor bearing capacity, the circulation on the site is only possible by foot, or using a light transportation mode to carry instruments. For example, a crawler wheelbarrow was used to carry heavy geophysical equipment.

7 REFERENCES

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