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Project name:
EML Warehouse

Project ref:
60681916

From:
AECOM

Date:
2 March 2023

To:
Welwyn Hatfield Borough Council
Affinity Water

Memo

Subject: Proposed Ground Investigation at Eisai Europe Limited, European Knowledge Centre, Mosquito Way, Hatfield, AL10 9SN

1. Introduction

This technical note summarises the proposals for a ground investigation at the above site and is specifically in relation to the following planning application made to Welwyn Hatfield Borough Council:

Construction of a 4,012sqm extension to the existing warehouse space (Use Class E) with associated plant and works including the relocation of a bicycle shelter, re-routed internal access road and landscaping (ref. 6/2022/1853/MAJ)

Affinity Water has raised an objection to the application in relation to the protection of groundwater quality, citing the site's location within a Source Protection Zone and the presence of bromate contamination in the Chalk aquifer. An intrusive ground investigation[1] (GI) has been designed by AECOM based on a meeting within Affinity Water on 6th January 2023. The objective is to understand the ground conditions at the application site to ultimately inform the assessment of foundation solutions (including the information needed to produce a piling risk assessment) so that the development can proceed without posing unacceptable risks to groundwater resources. In advance of carrying out the work this note provides the outline details of the GI for the benefit of Affinity Water and Welwyn Hatfield Borough Council.

2. Scope of Ground Investigation

A specialist GI Contractor will be appointed by the Client to undertake the GI works specified by AECOM. AECOM will act in the capacity of Investigation Supervisor. The geo-environmental aspects of the works proposed are as follows:

- 1 No. cable percussive borehole to approximately 20m below ground level (bgl) or 1m within the chalk layer, whichever is the deepest;
- 1 No. cable percussive borehole to approximately 20m bgl with follow-on rotary core drilling to a maximum depth of 30m bgl;
- 3 No. windowless sampling boreholes to a maximum depth of 8.0m bgl or refusal, whichever happens first;

[1] The investigation will also be for geotechnical assessment, however only the geo-environmental aspects of the scope are summarised in this note.

- In-situ Photo Ionisation Detector (PID) headspace screening of soil arisings;
- Use of aquifer protection drilling (telescopic drilling) techniques;
- Ground logging and geo-environmental sampling;
- Recording groundwater strikes and contamination observations;
- Installation of 5 No. 50mm groundwater monitoring wells in the two cable percussive boreholes and three windowless sampling boreholes (NB one installation per borehole, no dual installations proposed);
- Post field work groundwater monitoring and sampling;
- Geo-environmental laboratory testing (proposals summarised in this note, below);
- Production of a factual ground investigation report.

The ground investigation will be carried out in general accordance with BS 10175 and BS 5930 and monitoring wells will be drilled and installed with cognisance of the Environment Agency Science report SC020093 'Guidance on the design and installation of groundwater quality monitoring points'.

The GI has been designed to provide information such that a foundation works risk assessment (also referred to as a piling risk assessment) can be produced with reference to Environment Agency guidance 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention'.

The proposed locations of the five boreholes are shown in the attached figure and a summary schedule is provided in Table 1. It is noted that investigation locations shown on the figure referenced as TP, CBR and FP are for shallow ground geotechnical assessment only and are therefore not referred to in this technical memo which covers the geo-environmental assessment related to Affinity Water's groundwater impact concerns.

3. Geo-environmental Sampling and Testing

Soil samples for contamination testing will be recovered in all exploratory holes from any Made Ground and underlying natural strata. Sampling depths will be cognisant of the specification requirements but will also be at the discretion of the supervising ground engineer. However, the objective is to collect samples representing the range of soils that are encountered during the GI.

Headspace testing using a calibrated Photo Ionisation Detector (PID) (fitted with 10.6eV lamp) should be carried out on all environmental soil samples to assist in identifying samples possibly exhibiting the presence of semi-volatile and volatile organic compounds (SVOC and VOC).

If there are any discrete layers within the Made Ground or other strata where contamination might be suspected due to visual or olfactory assessment, these should be specifically sampled in addition to the above regime.

Up to eight soil samples will be tested for the main suite of analytes listed in Table 2. Depending on observations made, a provision is made for testing additional analytes also listed in Table 2.

Post intrusive works, six groundwater monitoring rounds will be undertaken at approximately weekly intervals, with the first visit carried out about one week after the completion of site works. It is proposed that on the third visit a groundwater sample is collected (providing enough water is present) from each of the five monitoring installations.

All groundwater samples will be tested for the main suite of analytes listed in Table 3. Depending on observations made, a provision is made for testing additional analytes also listed in Table 3.

Table 1: Schedule of Exploratory Boreholes

Exploratory Hole ID	Exploratory Hole Type[1]	Approx. Easting[2]	Approx. Northing[2]	Total Depth	In-situ Tests	Instrumentation	Rationale / Additional Comments
BH01	CP	521580	208897	20m	PID	50mm monitoring standpipe in Chalk	Investigation of geological profile and groundwater depth Soil sampling for geo-environmental testing Groundwater monitoring and sampling of Chalk aquifer Cable percussion drilling to at least 1m below top of structured Chalk (Grade C or better) (expected at approximately 20m bgl)
BH02	CP/RC	521520	208875	30m	PID	50mm monitoring standpipe in Chalk (Response zone: ~20m – 30m bgl)	Investigation of geological profile and groundwater depth Soil sampling for geo-environmental testing Groundwater monitoring and sampling of Chalk aquifer Cable percussion drilling below top of structured Chalk (Grade C or better) (expected at approximately 20m bgl) with rotary coring follow-on to scheduled depth
WS01	WS	521610	208872	8m	PID	50mm monitoring standpipe to 8m bgl in Lowestoft Formation	Investigation of Made Ground thickness due to previous cooling pond present. Soil sampling for geo-environmental testing Investigation of shallow geological profile and groundwater depth Groundwater monitoring and sampling of superficial aquifer
WS02	WS	521525	208873	8m	PID	50mm monitoring standpipe to 8m bgl in Lowestoft Formation	Investigation of shallow geological profile and groundwater depth Soil sampling for geo-environmental testing Groundwater monitoring and sampling of superficial aquifer Adjacent to borehole BH02, so together groundwater monitoring is possible within both the superficial and Chalk bedrock aquifers to assess vertical hydraulic gradient.
WS03	WS	521467	208960	8m	PID	50mm monitoring standpipe to 8m bgl in Lowestoft Formation	Investigation of shallow geological profile and groundwater depth Soil sampling for geo-environmental testing Groundwater monitoring and sampling of superficial aquifer

Notes:

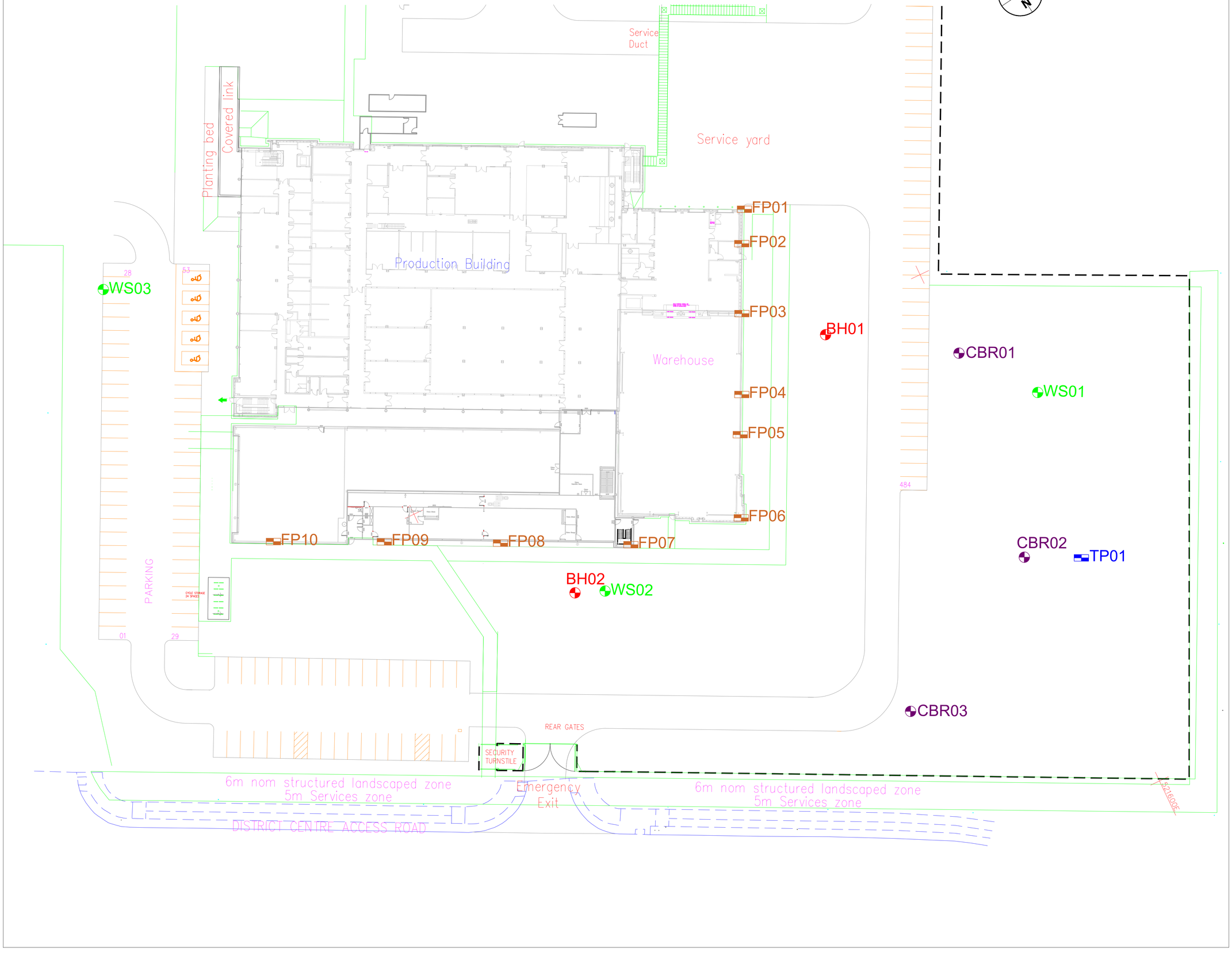
1. CP – Cable percussive drilling, RC – Rotary coring drilling, WS – Window sampling, PID – Photo-ionisation Detector.
2. Exploratory hole locations are indicative. Final locations to be confirmed with the Investigation Supervisor.

Table 2: Geo-environmental Soil Analysis

Main Suite Analytes
pH
Arsenic
Cadmium
Chromium III
Chromium VI
Copper
Mercury
Nickel
Lead
Selenium
Zinc
Boron (water soluble)
Cyanide (total)
Cyanide (free)
Sulphide (acid soluble)
Sulphate (water soluble)
TPH (TPHCWG, plus BTEX and MTBE)
Speciated Phenols
Speciated PAH (16)
Total Organic Carbon
Bromate (0.1mg/kg)
Provisional Analytes
Asbestos Screen and ID
Asbestos Quantification (<0.001%)
SVOC suite (exc. PAHs & inc. tentatively identified compounds (TICs))
VOC (EPA 8260) suite (inc. TICs)
Pesticide / Herbicide Soil Screen

Table 3: Geo-environmental Water Analysis

Main Suite Analytes
pH
Electrical conductivity
Alkalinity
Arsenic
Cadmium
Chromium III
Chromium VI
Copper
Mercury
Nickel
Lead
Selenium
Zinc
Boron
Sulphate
Sulphide
Ammoniacal nitrogen as N
Cyanide (total)
Cyanide (free)
BOD
COD
TPH (TPHCWG, plus BTEX and MTBE)
Speciated PAH (16) by GCMS
Bromate (0.10mg/l)
Provisional Analytes
Speciated Phenols
SVOCs Suite (exc. PAHs & inc. tentatively identified compounds (TICs))
VOC (EPA 8260) suite (inc. TICs)
Pesticide / Herbicide Water Screen



AECOM

PROJECT

Eisai Manufacturing Ltd (EML)
Facility Expansion

CLIENT

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- Please note that the presented exploratory hole locations are indicative only and subject to change pending the findings of a PAS128 Type B survey.
- Do not scale from this drawing. Work to figured dimensions only.

LEGEND

EXPLORATORY HOLE TYPE

- Trial Pit
- Cable Percussive / Rotary Coring Borehole
- Windowless Sample
- TRL-DCP (CBR)
- Hand Dug/ Foundation Pit

This drawing is for illustrative purposes only and is subject to amendment during design development.
UNDER NO CIRCUMSTANCES MUST THIS DRAWING BE USED FOR CONSTRUCTION PURPOSES.

ISSUE/REVISION

I/R	DATE	DESCRIPTION
01	15/11/2022	GI Location Plan

PURPOSE OF ISSUE

For Tender

PROJECT NUMBER

60670531

SHEET TITLE

Eisai Co Ltd Expansion, Hatfield

SHEET NUMBER

60681916 - GI