

ALPINE GROUP LIMITED



ALPINE HOMES

YACHT HAVEN SITE, HAYLING ISLAND

Remediation Verification Report

January 2022



eas ltd

Environmental Assessment Services Ltd

REPORT DATA SHEET

Requirement	Data
Report Reference	300b/YachtHaven/Alpine/RVR
Date	January 2022
Client	Alpine Group Limited
Report type	Remediation Verification Report
Purpose	Condition 20 - 22 of Planning Consent APP/13/00317
Revisions	
Prepared by	Eur Ing Malcolm McKemey BSc (Hons), CEng, CEnv, MICE, MIEAust, MCIWEM, MIEEnvSc  Signed
Checked by	Lisa Hawtin BSc (Hons), MIES, MIAQM  Signed

ALPINE GROUP LIMITED
YACHT HAVEN SITE, HAYLING ISLAND
Remediation Verification Report

January 2022

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1. THE SITE AND REDEVELOPMENT

- 1.1 The site comprises some 0.5 ha of formerly disused partly industrial land adjacent to Chichester Harbour. The site was previously used for the development of camouflage paint, as a boatyard and subsequently for materials, vehicle and plant storage. The levels for much of the site were raised with imported fill as part of the earlier development. The site location is at Ordnance Survey Map reference SU 7289 0183. See Appendix A, Figure 1 for the site location.
- 1.2 The eastern part of site lies on a variable thickness of made ground over Palaeocene Reading Beds (inter-bedded sands and clays). The site is not within a groundwater source protection zone.
- 1.3 The site has been redeveloped partly for residential use, with a small marina for leisure craft on the foreshore. The western part of the site has been returned to a natural habitat for wildlife and an area seaward of the residential area has been rehabilitated as coastal meadow for environmental enhancement. See Appendix A, Figure 2: As Built Redevelopment.
- 1.4 The site has been subject to a number of site investigations from 2002 to 2018. Areas of contamination were identified and remediation was recommended (Contamination Risk Assessment Summary of August 2017). This verification report is intended to confirm that the recommended remediation has been carried out in order to allow Conditions 20 - 22 of planning consent reference APP/13/00317 to be discharged.

2. SUMMARY OF IDENTIFIED CONTAMINATION

- 2.1 The risk of contamination was deemed significant as a consequence of:
- The site's previous history and use as a commercial boatyard since the 1930s, including wartime use for camouflage paint testing and subsequently for materials and vehicle storage.
 - The extensive made ground covering the site.
 - A recent history of burning waste at the site.

- The proximity of the site to Chichester Harbour SSSI (Site of Special Scientific Interest) and to other environmentally sensitive areas.

2.2 The site investigations (2002 – 2017) identified the following contamination:

- Heavy metal and Polycyclic Aromatic Hydrocarbon contamination was found in soil samples around the site, generally confined to the made ground and concentrated in areas where burning of waste had previously occurred. Asbestos was not found in the surface soil samples analysed, apart from one piece of bonded asbestos cement, found in a made ground sample from behind the foreshore.
- Groundwater sample analysis revealed minimal contamination, and this was initially taken as an indication that the risk of contamination leaching from the site into the Chichester Harbour SSSI was low. However, subsequent leachate testing of soil samples in 2018 revealed a small degree of contaminant mobility which could represent some risk to the SSSI.
- Soil gas monitoring was carried out at four boreholes across the site in 2002 (Factual Report on Contamination Tests – Pimenta, July 2002). The testing revealed some measurable concentrations of methane and raised concentrations of carbon dioxide at one borehole, however, these concentrations had reduced below significant levels in later monitoring.
- Traces of petroleum hydrocarbons were found in one of the five inter-tidal mud samples (the sample closest to the existing boat repair business).
- A trace of Triphenyl tin was identified in one inter-tidal mud sample from the eastern end of the site. None of the other samples revealed evidence of anti-fouling substances or other contamination.

3. RECOMMENDED REMEDIATION

3.1 The remediation recommendations given in the Contamination Risk Assessment Summary of August 2017 were:

- Remove all deposited superficial waste together with demolition waste as part of site clearance. Concrete and brick from demolished buildings, etc., may be crushed and recycled on site for granular fill, road bases, etc.
- All garden and soft landscaping areas to have the less suitable upper soil (made ground) removed and replaced with clean topsoil from a certified uncontaminated source to a depth of 0.6 m. The clean topsoil to be placed on a geotextile membrane and a capillary breaker sand layer introduced where the underlying ground is not natural undisturbed soil.

- The condition of soil exposed during site clearance, and in any excavations, to be monitored during the work and any evidence of significant contamination investigated, treated and/or removed from site as necessary.
 - As detailed in the Construction Environmental Management Plan (CEMP) of 2018, extra care should be taken during site redevelopment to ensure that no current site contaminants are displaced into the neighbouring SSSI and Ramsar sites. Guidelines to be in place prior to redevelopment commencing and adhered to throughout the construction phase.
 - All waste materials on site should be removed from the wildlife areas. The area should be enhanced with brash and wood piles, south facing soil banks (where practicable) and open compost heaps. Apart from the foregoing suggestions, the wildlife areas should be disturbed as little as possible.
 - To protect the foreshore from possible contamination leaching through from the site soil, a sheet-pile barrier was recommended to be installed behind the foreshore edge, along the area of the site where contamination had been identified. (Barrier proposal November 2018).
- 3.2 It was originally proposed to take seven additional inter-tidal mud samples, covering the area from the first location found to be uncontaminated in the west (FS3) to the site boundary in the east and including close to the two locations (FS1 and FS2) where traces of contamination were previously identified. The sampling was to be carried out when the boatyard in the centre of the site finally closed.
- 3.3 However, it has been decided not to proceed with the additional sampling at this time as the traces of contamination found in the two samples of intertidal mud, were not indicative of contamination leached from the site, the intertidal area is not within the ownership of the site, and the boatyard appears to still be in use. Additional sampling could be disruptive to the SSSI and any attempt at remediation in the inter-tidal mud is unlikely to be practicable and may be harmful to the SSSI.
4. VERIFICATION METHOD STATEMENT
- 4.1 A Verification Method Statement was prepared by Environmental Assessment Services Ltd in January 2019 (revised in March 2019), setting out the measures required to record the remediation work in progress, and to provide confirmation that the remediation of the site has been successfully completed. The measures comprised:

- Removal of any residual waste deposits and retention of consignment notes for any materials removed from site, plus any information relating to the condition of soil exposed during the development work.
- Provide evidence of the replacement of made ground in proposed garden and soft landscaping areas with clean topsoil from a certified source.
- Confirmation of the installation of the contamination migration barrier behind the foreshore.

5. REMEDIATION VERIFICATION

5.1 Additional Investigations

- 5.1.1 The site was visited on 3 July 2018 to confirm that the fly-tipped waste and bonfire residuals had been removed, the existing buildings had been demolished, waste concrete and brick from building demolition stockpiled and that site clearance had been largely completed. See photographs in Appendix A.
- 5.1.2 Soil samples were taken during the site visit at critical locations and analysed for the contaminants previously identified and compared with the results of the previous site investigations (Contamination Risk Assessment – Additional Investigations report August 2018). The results of the analysis confirmed the extent and nature of the contamination previously identified. The results of the investigation confirmed that the proposed remediation strategy remained appropriate. Further confirmation was given in Contamination Risk Assessment – Additional Investigations (August 2018).
- 5.1.3 The investigation work included analysis of samples taken from the inter-tidal mud seaward of the site, to establish whether there was any evidence of contamination from the site leaching into the foreshore. The only contamination identified comprised traces of hydrocarbons in the sample taken closest to the boatyard, and a trace of tributyltin from the sample taken between the boatyard and the boat moorings in the channel. No evidence of contamination leaching from the site was identified.

5.2 The Remediation Work

- 5.2.1 The photographs in Appendix B show the remediation work in progress in the soft landscaped areas in the central and eastern part of the site. The works comprised, removal of the made ground, the placing of the geotextile membrane and bringing the ground up to level using clean topsoil from an uncontaminated source.
- 5.2.2 The waste transfer notes for the waste materials and soils removed from the site are provided in Appendix C and summarised in Table 5.1 below:

TABLE 5.1

Period	Waste Carrier	Volume of Waste (m ³)	Waste Description	Disposal
13/11/2019 – 14/11/2019	TMR Southcoast Ltd	90	Hardcore	Shedfield for Reuse & Recycling
14/11/2019 - 18/11/2019	TMR Southcoast Ltd	225	Spoil (waste soil)	Pendean Landfill
27/01/2020	Havant Plant Hire Ltd	60	Clay & Stone	Pendean Landfill
27/01/2020 - 29/01/2020	Havant Plant Hire Ltd	135	Muck Away (waste soil)	Pendean Landfill
25/02/2020	Havant Plant Hire Ltd	60	Clay & Stone	Pendean Landfill
25/02/2020 - 28/02/2020	Havant Plant Hire Ltd	525	Muck Away (waste soil)	Pendean Landfill

5.2.3 The delivery notes for the importation of topsoil are given in Appendix C and summarised in Table 5.2 below:

TABLE 5.2

Delivery Period	Delivered by	Volume of Topsoil (m ³)	Origin/Supplier
02/12/2020	TMR Southcoast Ltd	60	E & K Contractors Midhurst
07/12/2020- 10/12/2020	TMR Southcoast Ltd	420	E & K Contractors Midhurst
16/12/2020- 18/12/2020	TMR Southcoast Ltd	255	E & K Contractors Midhurst
05/01/2021- 06/01/2021	TMR Southcoast Ltd	270	E & K Contractors Midhurst

5.2.4 The topsoil analysis certificate is provided in Appendix C.

5.3 The Contamination Migration Barrier

5.3.1 The contamination migration barrier comprises a light steel sheet-piled wall along the frontage, covering the area where soil contamination was originally identified. The function of the barrier was to prevent possible migration of contaminative materials from the site to the foreshore and inter-tidal zone.

5.3.2 The location, extent and penetration of the barrier was specified (Barrier Proposal 2018). The installation work is shown in photographs in Appendix B.

- 5.3.2 The site was visited on Monday 10 January 2022 to, inter alia, confirm that the contamination migration barrier had been completed as specified.

5.4 **The Wildlife Areas: Coastal Meadow and Coastal Grassland.**

- 5.4.1 The site visit of 10 January 2022, also assessed the condition of the wildlife areas comprising the western part of the site (preserved and enhanced as coastal meadow habitat) and the south-eastern corner of the site, between the development and foreshore, (to be created as coastal grassland habitat).
- 5.4.2 The coastal meadow habitat had been securely fenced and all waste had been removed, to leave the area in a generally pristine condition. Varying areas of shorter and longer vegetation had been preserved and allowed to develop undisturbed. A lower area in the centre provides an area of marshy habitat and a small area of bank around the edge. Ecological enhancements included a variety of bird nesting boxes, mainly fixed to the trees on the northern boundary of the area (within an established tree line). It is understood that reptiles were captured in the development area and relocated to the wildlife area at the start of the works. The habitat enhancement has been supervised by Ecosupport Limited acting as Ecological Clerk of Works. See photographs in Appendix B.
- 5.4.3 The coastal grassland area had been cleared of all waste and the area treated as recommended in the Remediation Strategy. Clean topsoil had been placed to a suitable depth and top sown with a suitable grass seed mix. The grass had germinated and showed good coverage. See photographs in Appendix B.

6. CONCLUSIONS

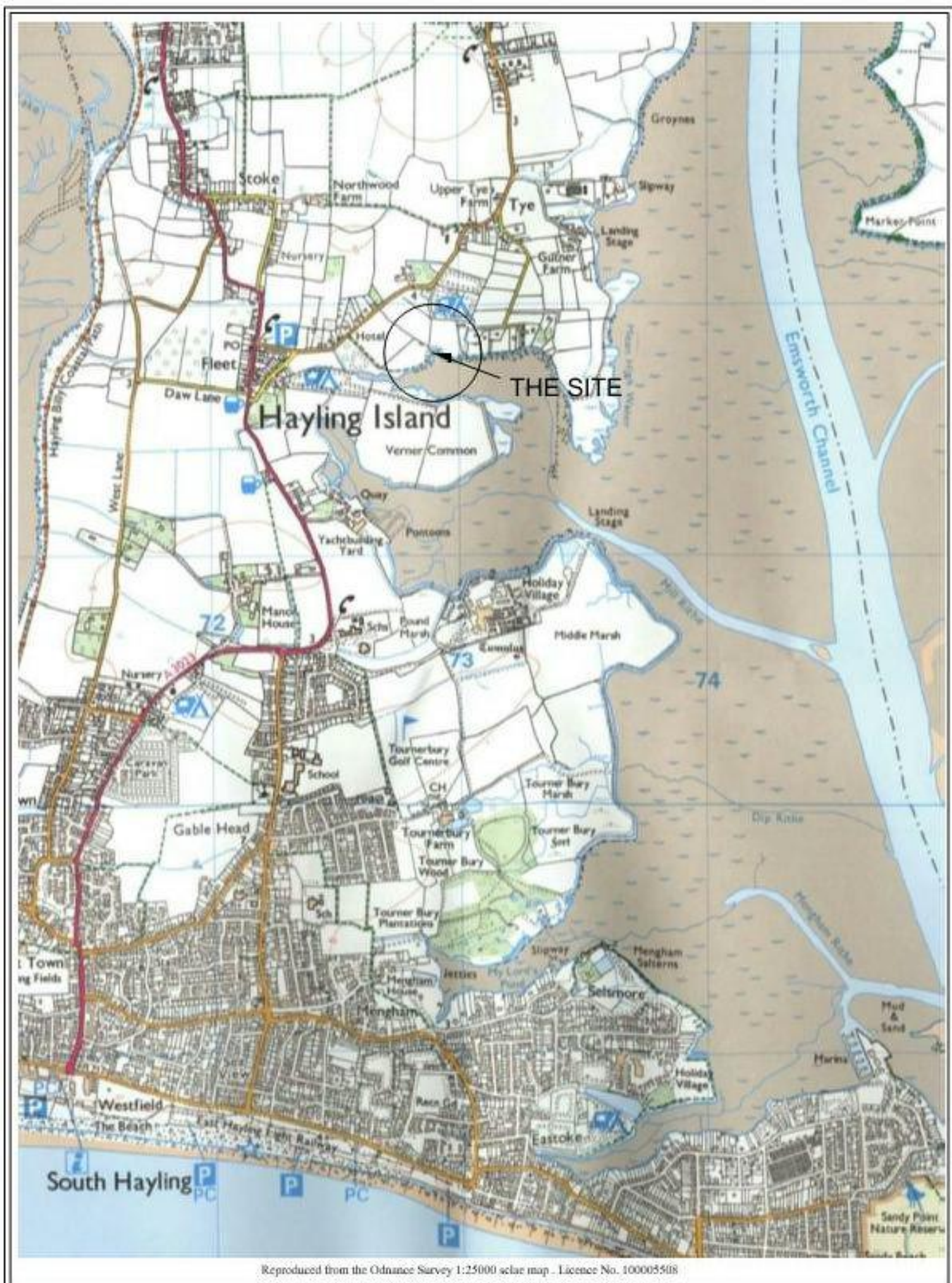
- 6.1 The site comprises some 0.5 ha of formerly disused partly industrial land adjacent to Chichester Harbour. The site had previously been used for the development of camouflage paint, as a boatyard and subsequently for the storage of materials, vehicles and plant. The levels of much of the site had been raised with fill as part of the earlier development.
- 6.2 The history of site investigations, remediation recommendations and subsequent remediation for the site redevelopment covers the period from 2002 to 2022. This includes extensive site investigations, several contamination risk assessments, two full environmental impact assessments (one for planning and one for the Marine Management Organisation (MMO) licence application for the marina moorings).
- 6.3 Contamination was found to be largely confined to the made ground in the centre of the site and remediation was recommended for those areas where future site users could have contact with the underlying soil or groundwater, i.e. the garden and soft landscaping areas within the proposed development.

- 6.4 The western part of the site has been preserved as a wildlife area comprising coastal meadow with ecological enhancements. The coastal frontage on the eastern part of the site has been remediated and recreated as coastal grassland habitat.
- 6.5 There was concern that contamination from soil within the site could leach into the inter-tidal zone on the foreshore. Samples taken from the inter-tidal sediments on the foreshore did not reveal evidence of contamination migration from the site. However, as there was some evidence of mobility of contamination within the soil samples taken from the onshore site, it was recommended that a contamination migration barrier should be installed in the form of a light sheet-piled wall positioned at the back of the foreshore in the affected area.
- 6.6 A Verification Method Statement was prepared in 2019, setting out the measures required to record the remediation work in progress, and to subsequently confirm that the remediation had been completed as recommended. This included site visits, photographing the remediation work in progress and collecting documentary evidence recording the removal of waste materials from the site and the importation of replacement clean topsoil to the areas requiring remediation.
- 6.7 The photographic evidence is provided in Appendix B and the documentary evidence, including the topsoil analysis certificate, the waste transfer notes, and the topsoil delivery notes are provided in Appendix C.
- 6.8 It is concluded that the remediation work has been carried out as recommended in the remediation strategy given in the Contamination Risk Assessment Summary of August 2017, the Habitat Creation Strategy of September 2017, the Contamination Risk Assessment – Additional Investigations of August 2018 and the Barrier Proposal of November 2018, and the evidence has been provided as specified in the Verification Method Statement of 2019.



APPENDIX A

Figure 1: Site Location Plan
Figure 2: The Site as Existing (As Built)



ALPINE GROUP LIMITED
Yacht Haven, Copse Lane, Hayling Island, Hants, PO11 0RH
Remediation Verification Report

Figure 1: Site Location

Scale 1:25000

January 2022



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Figure 2: Existing Site Layout (as built)

Scale as shown

January 2022

APPENDIX B

Photographs



Photo 1: Demolition & site clearance as photographed in July 2018. Waste stockpiled ready for removal.



Photo 2: Typical trial pit excavated as part of the July 2018 site investigation.



Photo 3: Inter-tidal mud sampling undertaken in July 2018.



Photo 4: Wildlife area (coastal meadow) in July 2018.

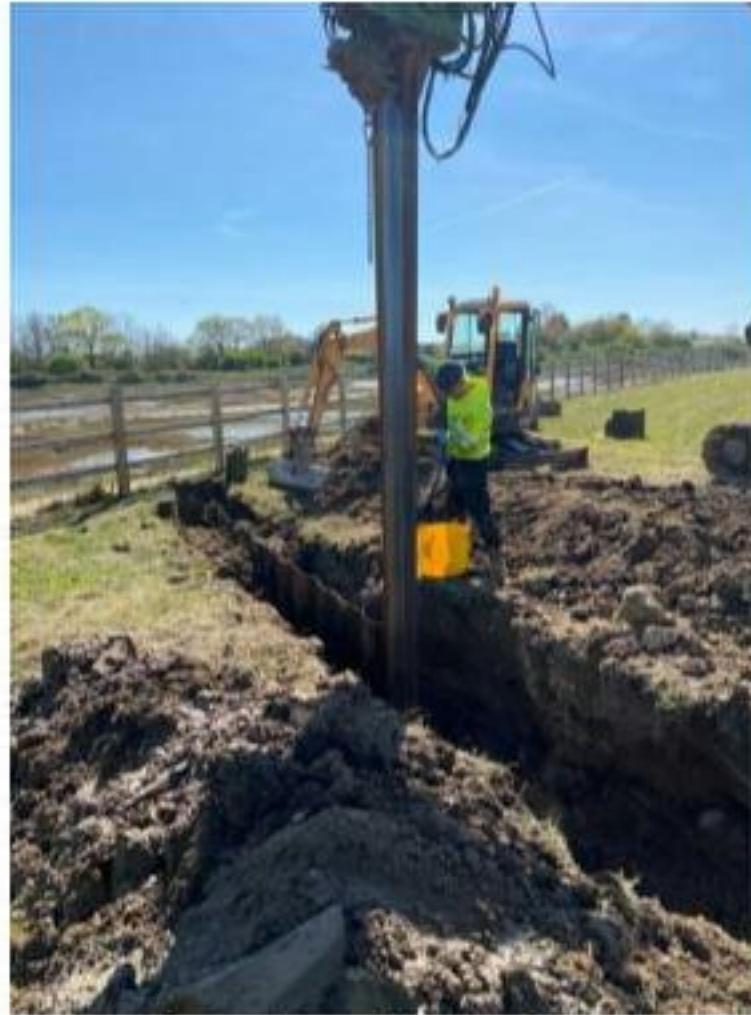


Photo 5: Setting & driving sheet piles for the contamination migration barrier (Photograph provided by Yachthaven).



Photo 6: View of the completed sheet pile contamination migration barrier prior to capping & placing revetments (Photograph provided by Yachthaven).



Photo 7: Landward return at end of contamination migration barrier (Photograph provided by Yachthaven).



Photo 8: Excavation, geotextile placement and topsoil placement (Photograph provided by Yachthaven).



Photo 9: Excavation and geotextile prepared for topsoil placement
(Photograph provided by Yachthaven)



Photo 10: Coastal grassland recently seeded (Photographed January 2022)



Photo 11: The contamination migration barrier - East.



Photo 12: The contamination migration barrier - West.



Photo 13: Wildlife area – coastal meadow (Photographed January 2022).

Further photographs can be provided as a separate file.

APPENDIX C

Documents



Our Ref: 20-22566
Your Ref:

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Analysis Report

Client: TMR Southcoast Ltd
Walton Road
Farlington
PO6 1UJ

Sample Details: 1 soil sample for Top Soil Analysis

Date report issued: 18 November 2020

Number of pages (including this one): 5

Accreditation

All analytes marked **M** have been analysed under the scope of our MCERTS accreditation

All analytes marked **U** have been analysed under the scope of our UKAS accreditation

All analytes marked **m** have been subcontracted and analysed under the scope of their MCERTS accreditation

All analytes marked **u** have been subcontracted and analysed under the scope of their UKAS accreditation

All results labelled with an asterisk (*) are non-conforming due to incorrect sample storage or handling. The result may be invalid.

All comments are beyond the scope of our accreditation.

The results shown in this test report specifically refer to the sample(s) tested as received unless otherwise stated.

This report shall not be reproduced except in full, without written approval of Envirochem.

Uncertainty of measurement is not accounted for in reported results

Signed on behalf of Envirochem by an authorised signatory



Christopher Mirzaians

Authorised Signatory



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Soil Analysis Report

(Analysed in accordance with BS 3882:2015)

Client: TMR Southcoast Ltd
Sample Lab Reference: Job: 20-22566-Samp. 64575-2
Site Details: Wedglen Industrial estate, Midhurst, GU29 9RE
Sample Point: Sample 1
Date Sampled: 9 November 2020
Submitted By: Client
Date Received: 10 November 2020
Date Analysis Started: 10 November 2020
Date Completed: 18 November 2020
Sampled By: Client
Sample Description: Soil - Loamy sand

Table 1 : Soil Texture (% m/m)

Texture	Method	Sample Result	Multipurpose Topsoil Range	Specific Purpose Range				
				Acidic	Calcareous	Low Fertility	Low Fert. Acidic	Low Fert. Calc.
Clay Content (%)	5.05	5						
Silt Content (%)	5.05	15						
Sand Content (%)	5.05	80						
Soil Texture Class	5.05	Loamy sand	Note: see soil texture triangle in BS3882:2015 for allowed soils					

Table 2 : Mass Loss on Ignition (%)

Clay percentage	Method	Sample Result	Multipurpose Topsoil Range	Specific Purpose Range				
				Acidic	Calcareous	Low Fertility	Low Fert. Acidic	Low Fert. Calc.
Clay (5 - 20 %)	6.09	2.6	3 - 20	3 - 30	3 - 30	2 - 20	2 - 20	2 - 20
Clay (20 - 35 %)	6.09		5 - 20	5 - 30	5 - 30	2 - 20	2 - 20	2 - 20

Table 3 : Maximum Coarse Fragment Content (% m/m)

Particle size	Sample Result	Multipurpose Topsoil Range	Specific Purpose Range				
			Acidic	Calcareous	Low Fertility	Low Fert. Acidic	Low Fert. Calc.
> 2 mm	22						
> 20 mm	0						
> 50 mm	0						

Table 4 : Chemical Analysis (air-dried, sieved (<2 mm) soil)

Analyte	Method	Sample Result	Multipurpose Topsoil Range	Specific Purpose Range				
				Acidic	Calcareous	Low Fertility	Low Fert. Acidic	Low Fert. Calc.
soil pH Value ^M	5.06 & 6.03	7.87	5.5 - 8.5	3.5 - 5.5	7.5 - 9.0	3.5 - 9.0	3.5 - 5.5	7.5 - 9.0
Calcium Carbonate (%)	6.07	3.1	-	-	> 1	-	-	> 1



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Table 5 : Available Plant Nutrient Content

Analyte	Method	Sample Result	Multipurpose Topsoil Range	Specific Purpose Range				
				Acidic	Calcareous	Low Fertility	Low Fert. Acidic	Low Fert. Calc.
Nitrogen (% m/m)		0.18	> 0.15	> 0.15	> 0.15	-	-	-
Extractable Phosphate (mg/l)	6.08	75.8	16 - 140	16 - 140	16 - 140	< 20	< 20	< 20
Extractable Potassium (mg/l)	6.08	84.2	121 - 1500	121-1500	121-1500	-	-	-
Extractable Magnesium (mg/l)	6.08	41.6	51 - 600	51 - 600	51 - 600	-	-	-
Carbon:Nitrogen Ratio		13.7	< 20:1	< 20:1	< 20:1	< 35:1	< 35:1	< 35:1
Soil Electrical Conductivity (µS/cm)		429.0	< 3300	-				
Exchangeable Sodium (%) 1)	6.08	2.21	< 15					

1) Need be measured only if the electrical conductivity is greater than 2800 us/cm

Table 6 : Phytotoxic Contaminants (by soil pH) (mg/kg) analyses carried out on air dried samples

	Method	Sample	Multipurpose and Specific purpose Topsoils		
Soil pH Range			< 6.0	6.0 - 7.0	> 7.0
Zinc M	5.18 & 6.08	86	< 200	< 200	< 300
Copper M	5.18 & 6.08	22	< 100	< 135	< 200
Nickel M	5.18 & 6.08	14	< 60	< 75	< 110

Table 7 : Additional Physical characteristics

	Method	Sample
Water Content (%)	6.01	9.6
Total Organic Carbon (%)	6.07	2.1
Soil Organic Matter (%)	6.09	3.6
Visible Contaminants (%)	Total Visible contaminants	0.0
	Plastic Visible contaminants	0.0
	Sharps Visible contaminants	0.0

Comments: (including details of weeds and other visible contaminants - all comments are beyond the scope of our accreditation)

Results marked with an asterisk (*) are non conforming due to sampling handling time or conditions. Therefore the result may be invalid.



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Table 8 : Additional metals (all results in mg/kg dry weight)

Analyte	Method	Sample	Soil Guideline Values		
			Residential	Allotment	Commercial
Arsenic M	5.18 & 6.08	12.9	37 †	43 †	640 †
Antimony	5.18 & 6.08	< 1	—	—	—
WS Boron	5.18 & 6.08	< 3.0	290 †	45 †	240000 †
Cadmium M	5.18 & 6.08	< 0.5	11 †	1.9 †	190 †
Chromium (total)	5.18 & 6.08	18	—	—	—
Cobalt M	5.18 & 6.08	5	—	—	—
Copper M	5.18 & 6.08	22	2400 †	520 †	68000 †
Mercury M	5.18 & 6.08	< 0.2	1.2 †	21 †	25.8 †
Molybdenum M	5.18 & 6.08	< 1	—	—	—
Nickel M	5.18 & 6.08	14	130 †	230 †	1800 †
Lead M	5.18 & 6.08	76	210 ††	84 ††	1100 ††
Selenium M	5.18 & 6.08	< 1	250 †	88 †	12000 †
Thallium	5.18 & 6.08	< 0.5	—	—	—
Vanadium	5.18 & 6.08	26	410 †	91 †	9000 †
Zinc M	5.18 & 6.08	86	3700 †	620 †	73000 †

All analytes marked ^M have been analysed under the scope of our MCERTS accreditation

Percentage >2mm not digested	5.01	22
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Comments: (comments are beyond the scope of our accreditation)

Limits Notes:

† are LQM/CIEH S4ULs (suitable for use levels) taken from The LQM/CIEH S4ULs for Human Health Risk Assessment published by Land Quality Press 2015

†† are LQM/CIEH C4SLs (Category 4 Screening Levels) taken from Appendix H Provisional C4SLs for lead and based upon Soil Guideline Values

For antimony values of less than 30mg/kg are typical of uncontaminated soil - as taken from 'Site investigation and materials problems', proc Conference on Reclamation of Contaminated Land, Eastbourne, Oct 79.



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Table 9: PAH in soil (all results in mg/kg dry weight)

Analyte	Method	Sample	Soil Guideline Values		
			Residential	Allotment	Commercial
PAH (total)	6.05	45.7	—	—	—
Naphthalene	6.05	0.17	23	4.1	190
Acenaphthylene	6.05	0.30	170	28	83000
Acenaphthene	6.05	0.55	210	34	84000
Fluorene	6.05	< 0.10	170	27	63000
Phenanthrene	6.05	1.88	95	15	22000
Anthracene	6.05	6.21	2400	380	520000
Fluoranthene	6.05	10.8	280	52	23000
Pyrene	6.05	8.73	620	110	54000
Benz(a)anthracene	6.05	4.24	7.2	2.9	170
Chrysene	6.05	0.42	15	4.1	350
Benzo(b)fluoranthene	6.05	4.61	2.6	0.99	44
Benzo(k)fluoranthene	6.05	0.38	77	37	1200
Benzo(a)pyrene	6.05	1.32	2.2	0.97	35
Dibenz(a,h)anthracene	6.05	0.39	0.24	0.14	3.5
Benzo(g,h,i)perylene	6.05	0.46	320	290	3900
Indeno(1,2,3-c,d)pyrene	6.05	5.21	27	9.5	500

Comments: (comments are beyond the scope of UKAS accreditation)

Limits are LQM/CIEN S4ULs (suitable 4 use levels) taken from The LQM/CIEN S4ULs for Human Health Risk Assessment published by Land Quality Ltd. 2015 based upon Soil Organic Matter of 1%

Table 10: TPH in soil (all results in mg/kg dry weight)

Analyte	Method	Sample	Soil Guideline Values		
			Residential	Allotment	Commercial
TPH total (C10 - C40)	6.04	433	—	—	—
TPH aromatic (C8 - C10)	6.04	< 5.00	34	8.6	3500
TPH aromatic (C10 - C12)	6.04	< 5.0	74	13	16000
TPH aromatic (C12 - C16)	6.04	< 5.0	140	23	36000
TPH aromatic (C16 - C21)	6.04	56.9	260	46	28000
TPH aromatic (C21 - C40)	6.04	340	1100	370	28000
TPH aliphatic (C8 - C10)	6.04	< 5.00	27	320	2000
TPH aliphatic (C10 - C12)	6.04	< 5.0	130	2200	9700
TPH aliphatic (C12 - C16)	6.04	< 5.0	1100	11000	59000
TPH aliphatic (C16 - C21)	6.04	< 5.0	65000	260000	1600000
TPH aliphatic (C21 - C40)	6.04	25.0	65000	260000	1600000

Date	Material	Mass	Vehicle registration	Delivered to	Ticket
13/11/2019	Waste (Hardcore)	15m ³	TMR/T80	Shedfield	6236
13/11/2019	Waste (Hardcore)	15m ³	TMR/RF11 UTS	Shedfield	6040
13/11/2019	Waste (Hardcore)	15m ³	TMR/RF11 UTS	Shedfield	6038
13/11/2019	Waste (Hardcore)	15m ³	TMR/RF11 UTS	Shedfield	6036
13/11/2019	Waste (Hardcore)	15m ³	TMR/T80	Shedfield	6234
14/11/2019	Waste (Hardcore)	15m ³	TMR/T80	Shedfield	6237
14/11/2019	Waste(Spoil)	15m ³	TMR/T80	Inert Landfill	6244
14/11/2019	Waste(Spoil)	15m ³	TMR/T80	Inert Landfill	6250
14/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6043
14/11/2019	Waste(Spoil)	15m ³	TMR/T80	Inert Landfill	6242
14/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6045
14/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	TMR Site	6041
14/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6047
18/11/2019	Waste(Spoil)	15m ³	TMR/T80	Inert Landfill	6455
18/11/2019	Waste(Spoil)	15m ³	TMR/T80	Inert Landfill	6453
18/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6050
18/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6402
18/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6404
18/11/2019	Waste(Spoil)	15m ³	TMR/T80	Inert Landfill	6457
18/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6048
18/11/2019	Waste(Spoil)	15m ³	TMR/RF11 UTS	Inert Landfill	6451

Date	Material	Mass	Vehicle registration	Delivered to	Ticket
02/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11887
02/12/2020	Topsoil	15m ³	TMR/HY69 DXF	Alpine Homes	11969
02/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11087
02/12/2020	Topsoil	15m ³	TMR/WU67 KHO	Alpine Homes	11968
07/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11893
07/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11095
07/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11892
07/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11890
07/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11091
07/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11889
07/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11090
07/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11891
07/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11094
07/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11093
07/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11722
08/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11896
08/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11726
08/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11098
08/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11895
08/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11097
08/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11724
08/12/2020	Topsoil	1xload	TMR/HY69 DOJ	Alpine Homes	11894
08/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11723
08/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11096
08/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11725
08/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	11099
08/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11727
10/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11732
10/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11729
10/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11728
10/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11730
10/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11731
16/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	12062
16/12/2020	Topsoil	14m	TMR/LK07 SRO	Alpine Homes	12061
17/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11745
17/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11746
17/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11747
17/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	12063
17/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11748
17/12/2020	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	12064
17/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11749
18/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11371
18/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12102
18/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12101
18/12/2020	Topsoil	15m ³	TMR/RF11 UTL	Alpine Homes	11368
18/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	11750
18/12/2020	Topsoil	15m ³	TMR/RF11 UTL	Alpine Homes	11369
18/12/2020	Topsoil	15m ³	TMR/RF11 UTL	Alpine Homes	11370
18/12/2020	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12103

05/01/2021	Topsoil	15m ³	TMR/WU19 KCN	Alpine Homes	10829
05/01/2021	Topsoil	15m ³	TMR/WU19 KCN	Alpine Homes	10830
05/01/2021	Topsoil	15m ³	TMR/WU19 KCN	Alpine Homes	10828
05/01/2021	Topsoil	15m ³	TMR/WU19 KCN	Alpine Homes	10827
05/01/2021	Topsoil	15m ³	TMR/WU19 KCN	Alpine Homes	10826
05/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12255
05/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12254
05/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12253
05/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12252
05/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12251
06/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12258
06/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12259
06/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12260
06/01/2021	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	12068
06/01/2021	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	12069
06/01/2021	Topsoil	15m ³	TMR/LK07 SRO	Alpine Homes	12071
06/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12256
06/01/2021	Topsoil	1xload	TMR/RF11 UTS	Alpine Homes	12257

Date	Description/EWC Code	Mass	Vehicle Registration	Delivered to	Ticket
27/01/2020	Muck away	15m ³	HX18 OEB	Pendean	6546
27/01/2020	Clay + Stone	15m ³	YN13 SXP	Pendean	7229
27/01/2020	Muck away	15m ³	FJ15 EHO	Pendean	4505
27/01/2020	Muck away	15m ³	FJ15 EHO	Pendean	4504
27/01/2020	Muck away	15m ³	FJ15 EHO	Pendean	4503
27/01/2020	Muck away	15m ³	FJ15 EHO	Pendean	4502
27/01/2020	Clay + Stone	15m ³	YN13 SXP	Pendean	7230
27/01/2020	Clay + Stone	15m ³	YN13 SXP	Pendean	7228
27/01/2020	Clay + Stone	15m ³	YN13 SXP	Pendean	7227
28/01/2020	Muck away	-	FJ15 EHO	Pendean	7315
28/01/2020	Muck away	15m ³	FJ15 EHO	Pendean	7316
28/01/2020	Muck away	15m ³	FJ15 EHO	Pendean	7317
29/01/2020	Muck away	15m ³	HX19 YPO	Pendean	7160
25/02/2020	Muck away	15m ³	HX19 YPO	Pendean	7200
25/02/2020	Muck away	15m ³	HX19 YPO	Pendean	7497
25/02/2020	Muck away	15m ³	HX19 YPO	Pendean	7496
25/02/2020	Muck away	15m ³	HX19 YPO	Pendean	7495
25/02/2020	Clay + Stone	15m ³	HL19 SUR	Pendean	7137
25/02/2020	Clay + Stone	15m ³	HL19 SUR	Pendean	7134
25/02/2020	Clay + Stone	15m ³	HL19 SUR	Pendean	7135
25/02/2020	Clay + Stone	15m ³	HL19 SUR	Pendean	7136
26/02/2020	Muck away	15m ³	HX18 OEB	Pendean	7042
26/02/2020	Muck away	15m ³	HX19 YPO	Pendean	7499
26/02/2020	Muck away	15m ³	HX19 YPO	Pendean	5848
26/02/2020	Muck away	15m ³	HX19 YPO	Pendean	5849
26/02/2020	Muck away	15m ³	HX18 OEB	Pendean	7040
26/02/2020	Muck away	15m ³	HX18 OEB	Pendean	7041
26/02/2020	Muck away	15m ³	HX18 OEB	Pendean	7039
26/02/2020	Muck away	15m ³	HX19 YPO	Pendean	7498
27/02/2020	Muck away	15m ³	HX18 OEB	Pendean	6544
27/02/2020	Muck away	15m ³	HX18 OEB	Pendean	6547
27/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8253
27/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8252
27/02/2020	170504	-	YN13 SPX	Inert Pendean	7967
27/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8251
27/02/2020	Muck away	15m ³	HX18 OEB	Pendean	6545
27/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8254
27/02/2020	Muck away	15m ³	FJ15 EHO	Pendean	4501
28/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8256
28/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8257
28/02/2020	170504	-	YN13 SPX	Inert Pendean	7971
28/02/2020	Muck away	15m ³	FJ15 EHO	Pendean	4833
28/02/2020	170504	-	YN13 SPX	Inert Pendean	7969
28/02/2020	170504	-	YN13 SPX	Inert Pendean	7970
28/02/2020	Muck away	15m ³	FJ15 EHO	Pendean	4830
28/02/2020	Muck away	15m ³	FJ15 EHO	Pendean	4831
28/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8255
28/02/2020	170504	-	YN13 SPX	Pendean	7968
28/02/2020	Muck away	15m ³	HX18 OEB	Pendean	6550

28/02/2020	Muck away	15m ³	HX18 OEB	Pendean	6549
28/02/2020	Muck away	15m ³	HX18 OEB	Pendean	6548
28/02/2020	Muck away	15m ³	HX19 YPO	Pendean	8258

APPENDIX D

References

List of Reports for Yachthaven Site

1. Preliminary Contamination Assessment (Fastnet Builders Limited, December 2001)
2. Environmental Study – Scoping Report (Fastnet Builders Limited, February 2002)
3. Factual Report on Contamination Tests (Pimenta, July 2002)
4. Contamination Assessment (Fastnet Builders Limited, September 2002)
5. Environmental Impact Assessment (Fastnet Builders Limited, December 2002, Revised March 2003)
6. Assessment of Ecological Impacts of Proposed Development of 9 Detached Houses at Yachthaven, Copse Lane, Hayling Island (Fastnet Builders Limited, December 2003)
7. Flood Risk Assessment (Cowan Consultancy Ltd, August 2010)
8. Desk Study Report For Yachthaven Copse Lane Hayling Island (Pimenta, October 2010)
9. Arboricultural Implications Assessment and Method Statement (Ecourban Consulting, March 2011)
10. Ecological Assessment (Phase II surveys), (GPM Ecology, April 2011)
11. Visual Impact Assessment (TGD Landscape Ltd, October 2011)
12. Environmental Impact Assessment Contamination Assessment Update Report (EAS Ltd, October 2011)
13. Ecological Assessment (Ecosupport Limited, November 2011, Revised July 2012)
14. Environmental Statement (EAS Ltd, December 2011)
15. Yachthaven Eelgrass Monitoring (Ecosupport Limited, June 2015)
16. Phase I Bat Report (David Leach Ecology Ltd, February 2017)
17. Contamination Risk Assessment Summary (EAS Ltd, August 2017)
18. Landscape Management Plan (TGD Landscape Ltd, August 2017)
19. Ecological Mitigation Plan (EAS Ltd, September 2017)
20. Habitat Creation Strategy & Timetable (EAS Ltd, September 2017)
21. Ecological Management Plan (Ecosupport Limited, November 2017)
22. Contamination Risk Assessment – Additional Investigations (EAS Ltd, August 2018)
23. Barrier Proposal (EAS Ltd, November 2018)
24. Remediation Verification Method Statement (EAS Ltd, January 2019, revised March 2019)
25. Eelgrass Survey 2020 (John Norton Ecology, August 2020)
26. Flood Risk Assessment (EAS Ltd, October 2020)
27. Ecological Impact Assessment (EAS Ltd, October 2020)
28. Landscape and Visual Impact Assessment (EAS Ltd, October 2020)
29. Archaeological and Cultural Heritage Assessment (EAS Ltd, November 2020)
30. Air Quality and Climate Change (EAS Ltd, November 2020)
31. A Benthic Biological Survey of the Yachthaven, Mill Rythe, Hayling Island (Fathom Ecology Limited, December 2020)
32. Environmental Statement (EAS, Ltd, December 2020, Addendum August 2021)



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