

Cable run at former location of BH303 and BH202B



Cable run across north- centre of the site



Cable run across location of PRB108





Site: Former Sunninghill Gas Works, Ascot Client: Berkeley Homes

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 14<sup>th</sup> to 16<sup>th</sup> September 2021 Time: 10:00 – 16:00 Weather: Mixed, dry Inspection made by Charles Wake

INSPECTION DETAILS / NOTES

The purpose of the works undertaken between 14th and 16th September was to supervise and record the groundwater remediation works undertaken by Dunton's, with Subadra being the contractors. The project leader for Dunton is David Knapp.

Site activities on 14th September comprised a site meeting between JNP, Dunton's and Subadra, with the groundwater remediation activities undertaken on 15<sup>th</sup> and 16<sup>th</sup> September 2021.

The groundwater remediation methodology comprised injection of Regenesis Oxygen Release Compound (ORC) under pressure into the ground, to depths of approximately 11 m. on reaching maximum depth, the probe was withdrawn in 1 m lengths and the ORC pumped into the ground at 140 PSI pressure until no further 'take' of groundwater was recorded. At this point, the probe was extracted 1 m and the injection recommenced until no more fluid was taken by the ground, and the process was repeated until a depth of 3 m below ground level, when the hole was terminated above the groundwater table. The probe had a diameter of 40 mm and was driven into the round by hydraulic percussive methods from a rig mounted to the back of a 'Sprinter'-type van.

The purpose of the Regenesis ORC is to oxygenate the aquifer and promote a combination of chemical oxidation and growth of soil bacteria that will metabolise the hydrocarbons within groundwater. The remediation takes place over a period of time as the ORC slowly dissolves in groundwater, releasing oxygen over a period of up to 12 months.

The Regenesis ORC injection was undertaken within three grid arrays of medium-closely spaced injection points with injection sites approximately 5m spaced. The grid arrays were located in the regions of the site where the highest concentrations of hydrocarbon contaminants had been recorded within the groundwater, within the centre-west of the site in proximity to BH201A, BH301 and PRB104, in the north-west of the site in proximity to BH201A, BH301 and PRB104, in the north-west of the site in proximity to BH306 and in the north-west of the site in proximity to PRB108, BH303A, BH203 and PRB117. Due to the presence of higher concentrations of hydrocarbons within the north-east of the site, in addition to the ORC being used, microfine powdered activated carbon (2 um to 5 um grain size) to sorb and inactivate hydrocarbons.

Dunton's monitored the groundwater levels in adjacent monitoring boreholes during the injection works and generally recorded slight temporary increases of up to 0.5 m resulting from localised doming of the water table associated with the injection of a large volume of water.

It was also noted that the subsurface water take and permeability was quite variable, due to localised variation in the clay, sand and gravel content of the Bagshot Formation and deeper areas of Made Ground. This locally high permeability resulted in remediation fluid being recorded directly within some of the monitoring wells in proximity to the injection points, most notably within BH201A, BH306, BH307A and PRB117. Additionally, there was generally slight surfacing of the remedial fluid at each injection point.

David Knapp advised that these boreholes would still be serviceable however would likely benefit from extra purging and an extended delay before re-sampling, to achieve meaningful results.

Additionally, it was discussed that due to the loss of BH202B, BH303 and damage to BH305, it would be possible to mobilise a rig to install two new boreholes to replace BH202B/BH303 and BH305, as the van mounted rig could not penetrate to greater than 11m depth due to the density of the deeper soils, and a depth of 15 m + was required for the BH202B / BH303 replacement.

The works were completed to specification on morning of 17<sup>th</sup> September.

Within the south of the site, the piling mat was substantially complete and it was confirmed on site that piling works would commence in the south in early-mid September and would run for 4 to 6 weeks. Groundwater samples collected from MWA1 and BH304. Sample from BH304 smelled acrid. BH305 blocked by kink in the pipe.



#### Injection setup

Injection in north-west of the site



Injection near PRB117



### Injection chemicals



Injection fluid mixing



### Location of injection in centre-west of site adjacent to BH201A and BH301



Surfacing of injection fluid at completion of hole





Piling mat in south-east of the site





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 9<sup>th</sup> November 2021 Weather: Sunny Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

Purpose of site visit was to undertake general site inspection and undertake gas and groundwater monitoring.

Piling works have been completed in south and centre of the site. Pile beams and road subgrades have been constructed in these areas.

Ongoing groundworks in north of the site, immediately west of PRB117 to construct a stormwater storage tank. The tank is of 'milk-crate' type construction and lined with plastic. The base is approximately 3 m below site levels. Arisings have temporarily been stored in the north-central part of the site.

Arisings were locally black and highly odorous, with some free product hydrocarbon observed.

Base of excavation appeared dry with no pooling of contaminated water or oil.

Groundwater samples collected from PRB117, MWA1, BH203, BH303A, BH304, BH305A, BH306 and BH307A.

Gas monitoring undertaken of DS101, DS102, DS103, DS104 and DS105

Pile beams in place in south of the site



Works in south of the site



Excavation for stormwater tank in north of the site



Contaminated soils being excavated from tank location



### North-east of the site showing some arisings excavated from tank location



Stored arisings from tank location



#### Approximate extents of excavation





Site: Former Sunninghill Gas Works, Ascot

Client: Berkeley Homes

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 27<sup>th</sup> September 2021 Weather: Sunny Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

The purpose of the visit was to undertake the first round of groundwater monitoring from MWA1, PRB117, BH203, BH303A, BH304, BH305A, BH306 and BH307A following the groundwater remediation works.

Sampling was not undertaken from BH306 and BH307A as pre-sampling purging indicated that the boreholes had been impacted by the white ORC fluid. These boreholes were purged to initiate inflow of fresh groundwater to enable sampling at a later date.

PRB117 and BH203 were impacted with thick black fluid (microfine activated carbon) that was not oily or odorous. Samples were collected. Example of the material on dip meter at BH203





Site: Former Sunninghill Gas Works, Ascot

Client: Berkeley Homes

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 13<sup>th</sup> October 2021 Weather: Overcast Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

Site inspection undertaken indicated that piling works had been commenced within the southern part of the site, and that construction of the piling mat was ongoing within the centre of the site.

Levels had been brought up to completion within the northern part of the site.

Sampling was undertaken from PRB117, BH203, BH303A, BH304 and BH305A.

BH203 and PRB117 still contained activated carbon and were sampled. BH306 and BH307A still contained ORC and were not sampled.

MWA 1 was not sampled as it was located within a temporary restricted works area.

Ground gas monitoring was undertaken in DS101, DS102, DS103, DS104 and DS105. <u>Piling works</u>





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 22<sup>nd</sup> October 2021 Weather: Overcast Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

JNP had been informed the day before that BH201A may be at risk of being damaged by works to install sewer line. Consequently the visit date was brought forward to ensure that samples could be collected, should the position be lost.

Piling works were ongoing within the central part of the site. New Berkeleys compound being set up in the south. No other deep groundworks or remediation ongoing. In situ-pile tops were observed in the south of the site.

Sewer being constructed within central western part of the site.

Sampling was undertaken from all serviceable boreholes, MWA1, PRB104, PRB117, BH201A, BH203, BH301, BH303A, BH304, BH305A, BH306, BH307A.

BH304 and BH305A still had acrid odour. Activated carbon was still present in BH203 and PRB117. Slight ORC presence was observed in BH201A, BH203, PRB104, BH306 and BH307A.

Due to short notice of works, gas monitoring or dip measurements within the boreholes were not undertaken.

Piling works near centre of the site



View across centre of the site from the east, piling mat and piling works



North-east of the site with piling mat



Piling works





Laying out of ramp in north-west of the site





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Date of Inspection: 9<sup>th</sup> November 2021 Weather: Sunny Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

Purpose of site visit was to undertake general site inspection and undertake gas and groundwater monitoring.

Piling works have been completed in south and centre of the site. Pile beams and road subgrades have been constructed in these areas.

Ongoing groundworks in north of the site, immediately west of PRB117 to construct a stormwater storage tank. The tank is of 'milk-crate' type construction and lined with plastic. The base is approximately 3 m below site levels. Arisings have temporarily been stored in the north-central part of the site.

Arisings were locally black and highly odorous, with some free product hydrocarbon observed.

Base of excavation appeared dry with no pooling of contaminated water or oil.

Groundwater samples collected from PRB117, MWA1, BH203, BH303A, BH304, BH305A, BH306 and BH307A.

Gas monitoring undertaken of DS101, DS102, DS103, DS104 and DS105



Works in south of the site



Excavation for stormwater tank in north of the site



Contaminated soils being excavated from tank location



### North-east of the site showing some arisings excavated from tank location



### Stored arisings from tank location



#### Approximate extents of excavation





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

### www.jnpgroup.co.uk

Date of Inspection: 24<sup>th</sup> November 2021 Weather: Cold, Overcast Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

Purpose of site visit was to undertake general site inspection and undertake gas and groundwater monitoring.

Piling works ongoing in north-east of the site for block adjacent to PRB117, BH203 and BH303A. Piling undertaken with a minirig, using rotary auger.

Stormwater storage tank has been finished and covered over with soil.

Piling mat has been laid for northern-central block.

An open trench approximately 3 m in depth, with battered-back sides has been excavated to the west of the northern-central block, for the installation of a sewer outfall. Soils to a depth of 1 m to 1.5 m were generally black and ashy, however no odour was noted, nor free product observed. Soils at the base of the trench comprised yellow brown sand. The base of the trench was dry.

Groundworkers were using the area constructed as a piling mat as a works storage and plant access area to the sewer installation. As a result of this, BH306 has been lost, presumed crushed and buried.

MWA1 on the west of the trench is intact, however the existing kink in the pipe appears to have been made worse by the recent groundworks and it was not possible to draw sample even with a minibailer.

Groundwater samples collected from PRB117, BH203, BH303A, BH304, BH305A and BH307A. Gas monitoring undertaken of DS01, DS101, DS102, DS103, DS104 and DS105.

Strip of land at south-east of the site has been cleared of vegetation and stripped. Levels have been reduced by approximately 500 mm from previous. Soils exposed at surface are black to dark grey and ashy, with some brick and clinker.



Levels reduction in south-east of the site adjacent to BH305A





Piling mat and works area in north centre of the site, BH306 should be beneath the tracking area or small stockpile.



Sewer Excavation





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 9<sup>th</sup> December 2021 Weather: Sunny Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

The site visit indicated that no further remedial excavations had been undertaken since the previous visit. However it was noted that excavated soils relating to the previous reduction of levels in the south-east of the site were no longer present.

No piling activities were ongoing, however it was confirmed that piling works for the final block (the northcentral block) will commence near the end of December and continue to mid January 2022, using a piling minirig.

The deep excavation previously noted in the north of the site to install a new sewer had been largely backfilled with site -won material. The material appeared as brown silty sand. Works to complete this excavation resulted in the loss of borehole MWA1.

Groundworks to install the new site road have resulted in the loss of borehole BH201A. BH306 was confirmed as lost and PRB104 was not located, assumed lost due to groundworks progress.

Samples collected from PRB117, BH203, BH303A, BH304, BH305 and BH307A.

Backfilling of sewer trench, north of the site



Location of BH201A and BH301





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 14<sup>th</sup> January 2022 Weather: Sunny Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

The site visit indicated that no further remedial excavations had been undertaken since the previous visit. However it was noted that excavated soils relating to the previous reduction of levels in the south-east of the site were no longer present.

Piling works were ongoing with a mini-rig in the north of the site and are anticipated to run for two weeks before completion.

The deep excavation previously noted in the north of the site to install a new sewer had been completely backfilled with site -won material. The material appeared as brown silty sand. Works to complete this excavation resulted in the additional loss of boreholes DS02 and BH307A.

Temporary re-use of site-won made ground was noted in the south-west of the site to allow access to the rear of the buildings under construction for machinery, telehandlers etc. It was confirmed that this material would be removed later on.

DS103 was not observed on site, however a sewer manhole was noted at the approximate location. It was confirmed with Neville that the borehole had been removed to install the sewer pipe.

Groundworks to prepare levels for construction have results in the loss of BH304, BH305A and DS105. It should be noted that the location of BH305A was agreed with the groundworkers / client at the time, that the borehole would remain functional and not be in the way of future works.

Samples collected from PRB117, BH203, BH303A.



Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 25<sup>th</sup> January 2022 Weather: Overcast Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

The site visit was intended to undertake sampling from the remaining three boreholes present at the site and to undertake ground gas monitoring. However, it was noted on arrival to the site, that the three boreholes in the north-east of the site, BH303A, PRB117 and BH203 had been demolished, in order to construct a site parking area. The area had been surfaced with a brown clayey hardcore and vehicles were parked in the area. The cut-off remains of the pipework were discarded at the site of the site.

Piling works had been almost completed for the northern-central block.

It was understood from the site manager, Neville Golding, that the loss of BH307A was related to the groundworker having to reduce levels on the eastern side of the service trench prior to backfilling the trench, due to safety concern with operating heavy plant above a deep, unshored excavation. Hence the side was battered back, removing BH307A.

A large pile of reclaimed materials for use as subsoil was present in the north-central part of the site, with the sub layers of some garden areas having been placed around some of the blocks in the centre and south of the site.

Gas monitoring was undertaken from the three remaining standpipes, DS101, DS102 and DS104.

No samples collected.

Site markup notes – northern half of the site



Site markup notes - southern half of the site



Document No: QD016 Issue: C

North-east corner and loss of BH203 and BH303A



Stockpile of subsoil awaiting re-use in gardens



Central blocks subsoiled, with stockpile beyond





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

### www.jnpgroup.co.uk

Date of Inspection: 26<sup>th</sup> April 2022 Weather: Sunny Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

The site visit was undertaken to install borehole BH305B to enable further monitoring of groundwater quality in the south-east of the site.

The borehole was drilled with a Comacchio 205 rotary rig using open holing techniques, with logging of drilling returns. Soil samples were not collected.

The borehole installation was provided with a 2 m upstand, and marked with red and white tape and Chapter-8 type barriers to prevent it being damaged by groundworks.

A wider inspection of the site was not undertaken, however general construction works were ongoing, with ground beams being created for the most proximal properties.





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

### www.jnpgroup.co.uk

Date of Inspection: 5<sup>th</sup> May 2022 Weather: Overcast Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

The site visit was undertaken for the purposed of obtaining the first of six groundwater samples from BH305B.

Groundwater was recorded at 4.38 m depth and the base of the borehole was dipped at 8.00.m.

The borehole was purged to 3 x well volume before being allowed to recharge and sample taken.

The sample was taken directly to i2 Laboratories in Watford and scheduled on the day.



Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

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Date of Inspection: 24<sup>th</sup> May 2022 Weather: Sunny Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

The site visit was undertaken for the purposed of obtaining the second of six groundwater samples from BH305B.

Groundwater was recorded at 4.25 m depth and the base of the borehole was dipped at 8.00.m.

The borehole was purged to 3 x well volume before being allowed to recharge and sample taken.

The sample was taken directly to i2 Laboratories in Watford and scheduled on the day.

A general inspection of the site indicated that construction was ongoing however landscaping had not been commenced, except for a small area adjacent to the sales office in the south-western corner of the site.





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

### www.jnpgroup.co.uk

Date of Inspection: 7<sup>th</sup> June 2022 Weather: Sunny Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

The site visit was undertaken for the purposed of obtaining the third of six groundwater samples from BH305B.

Groundwater was recorded at 4.32 m depth and the base of the borehole was dipped at 8.00.m.

The borehole was purged to 3 x well volume before being allowed to recharge and sample taken.

The sample was taken directly to i2 Laboratories in Watford and scheduled on the day.

General construction works were ongoing, however no new groundworks were visible.



Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

### www.jnpgroup.co.uk

Date of Inspection: 20<sup>th</sup> June 2022 Weather: Sunny Inspection made by Charles Wake

#### **INSPECTION DETAILS / NOTES**

The site visit was undertaken for the purposed of obtaining the fourth of six groundwater samples from BH305B.

Groundwater was recorded at 4.32 m depth and the base of the borehole was dipped at 8.00.m.

The borehole was purged to 3 x well volume before being allowed to recharge and sample taken.

The sample was taken directly to i2 Laboratories in Watford and scheduled on the day.

Construction was ongoing and no new groundworks were observed. Most plots were at floor slab level or higher.





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

### www.jnpgroup.co.uk

Date of Inspection: 13<sup>th</sup> July 2022 Weather: Sunny Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

The site visit was undertaken for the purposed of obtaining the fifth of six groundwater samples from BH305B.

Groundwater was recorded at 5.01 m depth and the base of the borehole was dipped at 8.00.m.

The borehole was purged to 3 x well volume before being allowed to recharge and sample taken.

The sample was taken directly to i2 Laboratories in Watford and scheduled on the day.

General construction was ongoing, however no significant groundworks were observed, with all construction at above-ground level.



Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

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Date of Inspection: 26<sup>th</sup> July 2022 Weather: Overcast Inspection made by Charles Wake

### **INSPECTION DETAILS / NOTES**

The site visit was undertaken for the purposed of obtaining the sixth of six groundwater samples from BH305B.

Groundwater was recorded at 4.75 m depth and the base of the borehole was dipped at 8.00.m.

The borehole was purged to 3 x well volume before being allowed to recharge and sample taken.

The sample was taken directly to i2 Laboratories in Watford and scheduled on the day.

Gas membranes were being installed to plots adjacent to BH305 and granular base for patio and path areas had been installed.





Site: Former Sunninghill Gas Works, Ascot

**Client: Berkeley Homes** 

Job No: M41977

www.jnpgroup.co.uk

Date of Inspection: 6th May 2021

Time: 11:20 – 13:20 PM

Weather: Cloudy with sunny spells/Light Rain towards end. 9°C. Inspection made by Hilary Ilsley

**INSPECTION DETAILS / NOTES** 

Arrival on-site: 11:20am

<u>Site Walkover</u> Shown around site by Duntons' site foreman.

Remediation Work has progressed in the southern half to central part of the site. A grid system has been applied across the whole site for ease of reference for testing.

All the trees / shrubs have been removed from northern and south-east corner (some of this was previously done by St William.

In accordance with JNP Group Remediation Strategy, the spent oxide scrape has been undertaken and material stockpiled. Dunton informed JNP Group that in some areas the depth of scrape was deeper, with an average of 175 mm, extending deeper in places. Upon removal of the areas the excavation bases have been tested. Dunton have the validation testing and the results are to be provided to JNP Group in due course.

Visible ACM on the surface and within the soil was encountered in the south-western area when the surface scrape was done. This material has been either bagged where visible or included as part of the spent oxide stockpile for off-site disposal.

The following hot spots in the southern part of the site have been excavated: 6,7, 8, 9, 10. Hotspot 11 has not been excavated as this is located in the tree protection corridor. Dunton informed HI that hot spots 7 and 8 merged and subsequently were larger than expected. This material was taken to the treatment area for bioremediation.

The treatment area for "windrow turning" is located in the south-west of the site. Dunton's are aerating and testing the windrows on a regulator basis. No additional nutrients have been added to the windrow. Validation testing has indicated that the material is suitable for re-use under the capping layer.

#### **INSPECTION DETAILS / NOTES Continued**

Some site won natural ground has also been re-used on site . This has been tested by Dunton and found to be acceptable for re-use.

All site-won material is being tested to demonstrate suitability for use.

A covered stockpile located adjacent to the entrance, this contains a mix of soil contaminated with spent oxide and ACM from the spent oxide scrape areas as located in the south of the site. This stockpile is awaiting off-site disposal as hazardous waste.

In the central part of the site there was an extensive foundation that required breaking out, this extended further than anticipated.

Stockpiles of broken out concrete and bricks are present on site as well as stockpiles of Made Ground in central and northern parts of the site that require further testing. There was some evidence of blue billy staining on some of this material.

The HV electricity corridor in the central eastern part of the site has been uncovered. This is located next to the spent oxide impacted area, however, visible spent oxide is present in the Made Ground exposed, this will require excavation and remediation.

Odour suppression modules were on site and operational during the walkover. Environmental monitoring stations (dust, odour, noise) are positioned at five locations on site.

#### On-Site Meeting with Berkeley Homes and Dave Watkins (Dunton)

In the south-west of the site, BH wish to extend the garden areas into the root protection zone. No further remediation can be done in the tree root area, limit of 1500mm, but BH have said on other sites they have used covenants in the deeds to let the owners know they cannot dig down further in this area. HI said this can be addressed as a variation to the strategy in the Verification Report to avoid producing another version of the OARS Report, but we would need to let the council know. BH asked if JNP can let RBWMC know of this proposed change.

Monitoring borehole re-positioning: HI mentioned that track procession could be an option to ensure boreholes remain along north-eastern corner but this has time and cost implications and would d be night work. BH did not want to pursue this option, hence the only option JNP consider is the movement of the deep BH303 to the north-east location by the bunds adjacent to the substation. Shallow BH 302 will not be required as we will continued to use BH203 and BH202B for monitoring.

HI asked that Dave Watts send across the method statement for the bioremediation and groundwater treatment as this is outstanding.

HI also requested copy of plan detailing areas and depth of excavation currently completed, copies of all validation testing.

It was agreed that JNP group visits would be every two weeks, probably on a Wednesday.

Left site 13:20 pm.