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Hills Quarry Products Limited

Airfield Quarry

Gally Leaze, Gloucestershire

Application for Waste Recovery Permit

Environmental Setting and Site Design

Final Report
October 2022

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BCL CONSULTANT HYDROGEOLOGISTS' EXPERIENCE & QUALIFICATIONS

BCL is an independent consultancy specialising in all aspects of hydrogeology and hydrology as they relate to minerals extraction, waste disposal, water supply and related industries.

Paul Burfitt (the author of this report) holds a first degree [Geophysics (Geology)] conferred by Liverpool University, 1992 and a Master of Science Degree [Hydrogeology], Birmingham University, 1998. Paul Burfitt has worked in the Earth Sciences since 1992 and as a Hydrogeologist since 1998.

BCL has provided specialist services, advice and reporting to the extractive, waste and related industries since 2000. During this time BCL has worked on over 225 quarries/related sites throughout the British Isles, including a number of sites within the Cotswold District.

BCL's work has included:

- Installation and management of information collection systems;
- Data interpretation;
- Conceptualisation of hydrogeological systems;
- Identification of potential impacts;
- Formulation of mitigation measures;
- Management and undertaking of operational impact monitoring and impact assessment;
- Review and auditing of contingency mitigation schemes;

1 INTRODUCTION

1.1 Report Context

1.1.1 Hills Quarry Products Limited (Hills) have prepared a Planning Application seeking approval for the extraction of sand and gravel, with subsequent restoration, at a former airfield at Gally Leaze in Gloucestershire (herein referred to as Airfield Quarry and the Site). The application has been prepared in conjunction with the landowner - Farmcare Trading Limited (Farmcare).

1.1.2 The Site occupies an area of some 236 hectares (ha), with mineral extraction proposed within some 178ha. Mineral evaluation drilling has determined that working of the Site would yield some 6.5 million tonnes (mt) of saleable sand and gravel. At anticipated rates of production, this would equate to extraction over a period of some 13.5 years.

1.1.3 The proposed restoration will be facilitated through a program of inert infill placement, to create a landform incorporating areas returned to agricultural land, lowland meadow, wet woodland and ecological interest areas. The restoration plan has been prepared following extensive discussion with the Ministry of Defence, due to the relative close proximity of the strategically important Fairford RAF base, some 1.5km to the east.

1.1.4 Pre-application advice received from the Environment Agency (EA) in September 2021 (Ref: EPR/KB3507KY/A001) confirmed the areas of assessment required for the proposed Waste Recovery Operation.

1.1.5 The Recovery Operation requires application for an Environmental Permit (EP), Waste Recovery Activity, as issued by the EA, in support of which an Environmental Setting and Site Design (ESSD) is required to be submitted.

1.1.6 BCL Consultant Hydrogeologists Limited (BCL) have been appointed by Land and Mineral Management (LMM), agents of Hills, to draft an ESSD with regards to the proposed Recovery Operation.

1.1.7 BCL's wider work at the Site has included the drafting in 2020 of a Hydrological and Hydrogeological Impact Assessment (H&HIA, Ref: B/LMM/AQ_HHIA/20) and associated Flood Risk Assessment (FRA, Ref: B/LMM/AQ_FRA/20) in support of the Application, and the drafting in 2022 of a Hydrogeological Risk Assessment (HRA, Ref: B/LMM/AQ_HRA/22) as part of the EP Application with which this report should be read (and within which additional detail is available).

1.2 Site Details

1.2.1 Site Location and Access

1.2.1.1 The Site comprises a former airfield, located approximately 3 kilometres (km) northeast of Cricklade, to the north of the Cricklade – Kempsford road (Kempsford Road). The Site lies within the county of Gloucestershire, abutting the Wiltshire/Gloucestershire border, which runs immediately to the southwest.

1.2.1.2 The village of Down Ampney is situated approximately 0.75 kilometre (km) to the west-northwest of the Site at the closest approach, and similarly the village of Marston Meysey is some 0.6km to the northeast.

1.2.1.3 The National Grid Reference (NGR) for the centre of the Site is SU 114 965 and a plan depicting the Site location is provided at *figure 1*.

1.2.1.4 Access to the Site will be made on the southern boundary via a new entrance road from the Cricklade – Kempsford road.

1.2.2 Application Boundaries and Security

1.2.2.1 The Recovery Operation will encompass inert infill placement within the worked sand and gravel extraction phases as shown on *figure 2*.

1.2.2.2 The Site boundary is currently completed with a combination of agricultural fencing and hedges. The entrance to the Site from the Cricklade - Kempsford road will be secured with a locking gate.

1.2.3 Topography and Land Use

1.2.3.1 The Site is located in an area of extremely low relief within the upper reaches of the River Thames catchment. Ground elevations generally reduce from northwest to the east/southeast through the Site (from some 100 metres above ordnance datum [maOD]) to some 74maOD) and this is reflected in the regional drainage pattern for surface watercourses.

1.2.3.2 The landscape surrounding the Site comprises a rural setting under predominantly agriculture use (large fields of mixed grazing and arable), including isolated stands of trees/copse. In the southern section of the Site an area of historic mineral excavation has formed a series of shallow waterbodies known as Down Ampney Pits.

1.2.3.3 Large sections of the former concrete runways and connecting hardstanding areas remain in place, defining a triangle across the Site. The areas adjacent and in between the hardstanding areas are given over to agriculture, primarily worked as large arable fields/crop production. Limited isolated areas of tree plantation and woodland are also recorded, generally aligned with the former areas of hardstanding/site infrastructure.

1.2.3.4 Other land uses in the wider locality include areas of mineral extraction/restoration. The closest such area is located to the southeast of the Site at Whetstone Bridge (Cullimore). Further afield, extraction is also being undertaken at Eysey Manor Quarry (Tarmac) to the south and at Latton North Quarry (Hills) to the west (*figure 3*).

1.2.3.5 A recent topographic survey of the Site commissioned by the applicant (December 2016) shows ground levels to vary from some 82maOD at the western edge of the Site, reducing to some 77maOD at the southeastern boundary.

1.2.3.6 A contour plot depicting ground elevations within the Site and immediate locality, is reproduced at *figure 4*.

1.2.3.7 Although relief across the Site is low, the elevation data do record a relatively marked reduction from the central section of the Site (defined by the former runways and connecting hardstanding areas) onto lower lying areas across the southwestern

boundary of the Site (some 79maOD) and within the southeastern section of the Site (some 77maOD).

1.2.4 Site Context (0.5km radius)

Residential and Recreational

1.2.4.1 The principal areas of conurbation in the locality are at Down Ampney some 750m to the northwest and Marston Meysey some 600m to the northeast. In addition, a number of isolated properties are located close to the Site boundary along the Kempsford Road to the south of the Site and the minor road to the north of the Site.

Hydrological

1.2.4.2 The Site is located between two north – south flowing tributaries to the River Thames: the Ampney Brook to the west of the Site and the Marston Meysey Brook to the east of the Site.

1.2.4.3 In addition to the aforementioned main watercourses, the area encompassing the Site is drained by a series of minor (managed) drainage channels. The majority of these are ephemeral features, only active during periods of high groundwater levels or flood.

1.2.4.4 Local drainage is most prevalent within the lower lying area within the southern and eastern sections of the Site, where drainage is more critical to maximise land productivity. These drain to the southeast linking into the main River Thames in the area upstream of the confluence with the Marston Meysey Brook.

1.2.4.5 No surface waterbodies have been identified within the proposed infill areas at the Site. A series of ponds are located within the Site boundary to the south of the plant area. These are the Down Ampney Pits, a collection of largely ephemeral waterbodies created within an area of former sand and gravel extraction.

Ecological Designations

Statutorily Protected Sites of Ecological Importance

1.2.4.6 Details for the location of designated areas of ecological importance in the vicinity of the Site have been obtained from Natural England (NE) and are reproduced at *figure 5*.

1.2.4.7 There is one Site of Special Scientific Interest (SSSI) located within a 0.5km radius of the Site. This comprises two isolated areas of the Cotswold Water Park SSSI (CWP SSSI). The CWP SSSI comprises an extensive collection of relatively shallow open water areas, created by sand and gravel extraction, principally located to the west of the A419. The CWP SSSI has been recently extended to include the areas of extraction at Eysey Manor Quarry (south of the Site) and Whetstone Bridge/Roundhouse Farm (to the east of the Site). Details of the identified sites are provided at *table 1*.

Non-Designated Sites of Ecological Importance

1.2.4.8 Details for the location of non-designated sites of ecological importance located within a 0.5km radius of the Site have been obtained through a screening request made to the Gloucestershire Centre for Environmental Records (GCER). The location of identified sites are summarised at *table 2* and locations shown at *figure 5*.

Table 1 Statutorily Protected Sites			
Site Name	Distance* and Direction from Site	Designation	Summary Description
Cotswold Water Park SSSI	Roundhouse Farm area some 0.25km to the east of the closest area of infill within the Site and Eysey Manor Quarry (not yet fully restored) 0.25km to the south of the closest area of infill within the Site.	SSSI	Extensive system of relatively shallow, open water areas created within former sand and gravel extraction areas. Primarily focussed to the west of the A419, but with recent additional isolated areas included at Eysey Manor Quarry and Roundhouse Farm.
*-at shortest distance from the Site			

Table 2 Non-Statutorily Protected Sites			
Site Name	Distance* and Direction from the proposed development	Designation	Summary Description
Down Ampney Pits LWS	Within the Site redline area	Local Wildlife Site	Former gravel pits and wooded area, with ephemeral areas of open water
*-at shortest distance from the Site			

1.2.4.9 One non-designated site is identified in the locality. This comprises an area of shallow and largely ephemeral ponds, formed within an area of previous extraction within the southern section of the Site, but not forming part of the extraction proposals (Down Ampney Pits LWS).

1.2.4.10 The Down Ampney Pits LWS comprise a series of groundwater fed excavations of varying depth. The majority are shallow and dry out during the summer period. The largest and most central pond is slightly deeper and is normally sustained for the summer period.

Historic Landfill

1.2.4.11 Data supplied by the EA confirms that there are no operational or recorded historic landfills within the boundary of the Site.

1.2.4.12 The locations of operational and known historical landfill with a 0.5km radius of the Site, as taken from the EA's Public Register, are illustrated at *figure 3*. Summary details of these landfill sites are given below at *table 3*.

Table 3 Summary Detail for Landfill in the Vicinity of the Site				
Identification	Distance (km)*	Status	Class	Operator
Manor Farm Down	0.3	Historic	In,C&I,H	CWS. Last waste received 1953
In = Inert, H = Household, C&I = Commercial and Industrial, NI = No Information *At shortest distance from the Site boundary.				

1.2.4.13 All sites identified from the EA's Public Register are historic, with the closest being situated some 0.3km to the west of the Site at Manor Farm Down. This small area of landfill last received waste in 1953, within which inert, industrial, commercial and household waste streams are recorded as having been deposited.

1.2.4.14 To the south of the Site the restoration of Eysey Manor Quarry (EMQ) is being completed as a recovery operation and in part achieved through placement of inert fill material. The closest area of infill placement at EMQ (EMQ Phase 7) is located some 280m from the closest area of infill placement within the Site (the Plant Area).

1.2.4.15 A similar operation is being undertaken at Whetstone Bridge Farm (WBF), located to the southeast of the Site. The closest areas of working (WBF Phases 4 and 6) are located some 40m southeast of Phase 1 within the Airfield Quarry site. At the time of writing, sand and gravel from WBF Phase 4 has been extracted, with the area awaiting restoration through infill with imported inert material. WBF Phase 6 comprises the WBF Plant Area and is yet to be worked.

1.2.4.16 The restoration plans for both WBF Phases 4/6 and EMQ Phase 7, show the areas restored to pre-worked elevations with imported inert material. It is assumed that the placement of inert material within the WBF and EMQ restoration landforms has been suitably risk assessed and will therefore be conducted under appropriate Environmental Permit controls, to prevent any degradation in extant groundwater quality. It is also noteworthy that both locations are located down hydraulic gradient of the Site.

1.2.5 Site Classification

1.2.5.1 The Site is to be restored to a combination of ecological areas, lowland meadow and agricultural after use, by using the minimum required volume of imported inert waste material to achieve the desired landform, this being used in place of non-waste materials that would otherwise be needed to achieve the same outcome. On this basis, the proposed infill operation is deemed a recovery operation and a Waster Recovery Plan (WRP) has been prepared for initial review by the EA (see *section 1.1.4*) and submission alongside the EP application.

1.2.5.2 The foregoing notwithstanding, the EA consider that 'The Environment Agency's Approach to Groundwater Protection', Version 1.2, February 2018 (EAAGP) is applicable not just to landfills but also to the Deposit for Recovery schemes.

1.2.5.3 The EAAGP states that 'An inert landfill does not pose a potential hazard to groundwater (and hence it is not necessary to collect leachate and no drainage system is required), the EA will not object in principle to such a landfill on the basis of the location position statement E1, unless the Site falls within Source Protection Zone 1 [SPZ1]'.

1.2.5.4 Although the Site is defined as falling within an SPZ, the case is made within both the H&HIA and HRA that the near surface shallow sand and gravel aquifer at the Site (to be worked in this instance), is separated from the deeper Principal Aquifer from which the relevant abstraction for Public Water Supply is made. The separation is provided by lower permeability/non-aquifer strata comprising an expected minimum of some 40m thickness (combined Oxford Clay and Kellaways Formation).

1.2.5.5 UK SPZ mapping does not consider potential subsurface aquitards that would serve to isolate abstraction made at depth, from near surface geological units, as is the case at Airfield Quarry. Based on the foregoing it is apparent that although the Site is deemed to be located within the SPZ for the PWS abstraction, the geological succession underlying the Site will provide a laterally continuous and natural hydraulic barrier between the two groundwater regimes, serving to isolate the proposed development from the groundwater environment supporting the PWS abstractions.

1.2.5.6 The HRA conducted for the Site has further demonstrated that the Principal Aquifer is not at risk of negative impact based on the proposed inert infill placement.

1.2.5.7 On the above basis, it is considered that the restoration of the Site is acceptable within the EA's position statement guidance. It is further of note that similar sites within the locality have been granted permission for inert infill, which are similarly located within SPZ areas defined for isolated subsurface aquifer (Hills - Latton North Quarry).

2 SOURCE

2.1 Site Development

2.1.1 Historical Development

2.1.1.1 The current principal land use for the Site and surrounding area is agriculture. Within the central section of the Site, the area has been utilised as a airfield, with a triangular arrangement of concrete runways still remaining in place. As discussed at *section 1.2.4*, a small area to the west of the Site (Manor Farm Down) is recorded as being used for the deposition of wastes in 1953 (inert, industrial, commercial and household waste streams known to have been deposited).

2.1.2 Proposed Development

Proposed Waste Acceptance

2.1.2.1 Inert wastes are defined by the Landfill Directive (1999/31/EC), article 2(e) as: '*waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and / or groundwater*'.

2.1.2.2 Section 2.1.1 of the 2002 Council Decision, *'Establishing Criteria and Procedures for the Acceptance of Waste at Landfills Pursuant to Article 16 of and Annex II to Directive 1999/31/EC' (the Landfill Directive)*, lists a number of waste types that are considered inert without need for testing (subject to being single stream of a single waste type or combination of types).

2.1.2.3 Other waste types are also classified as inert provided that they meet the leaching limit values (determined by testing) outlined at section 2.1.2.1 of the Council Decision.

2.1.2.4 It is proposed that all wastes to be imported to the Site will meet with the above criteria, and any accepted wastes that are not listed at Section 2.1.1 of the Council decision will be tested to ensure compliance with section 2.1.2.1 of that decision.

The Recovery Operation is to accept such materials under the Waste Codes (WC) outlined below at *table 4*. The imported material will draw from waste streams established for supply to Hills nearby similar operations at Shorncote and Latton Quarries.

2.1.2.5 Acceptance of materials to the Recovery Operation will be controlled through Waste Acceptance Procedures (WAP). The WAP will require all waste producers to provide waste characterisation information prior to its delivery, with loads being subjected to Waste Transfer Note (WTN) checks and visual inspections on arrival at the Site. This information will be assessed by technically competent Site staff to ensure that accepted wastes are inert, from uncontaminated sites and within the conditions of the EP. Unsuitable materials will be declined and full records of accepted / rejected loads will be kept.

Table 4 Proposed Wastes Permitted for Recovery for Use in Quarry Restoration		
WC	Description	Comment
17 01 01	Concrete	Selected C & D waste only(*)
17 01 02	Bricks	Selected C & D waste only(*)
17 01 03	Tiles and ceramics	Selected C & D waste only(*)
17 01 07	Mixtures of concrete, bricks, tiles and ceramics	Selected C & D waste only(*)
17 05 04	Soil and stones	Excluding topsoil, peat; excluding soil and stones from contaminated sites
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of inert wastes other than those mentioned in 19 12 11+	Containing no hazardous substances
20 02 02	Soil and stones	Only from garden and parks waste; Excluding topsoil, peat
* Selected construction and demolition waste (C & D waste): with low contents of other types of materials (like metals, plastic, soil, organics, wood, rubber, etc). The origin of the waste must be known. No C & D waste from constructions, polluted with inorganic or organic dangerous substances, e.g., because of production processes in the construction, soil pollution, storage and usage of pesticides or other dangerous substances, etc., unless it is made clear that the demolished construction was not significantly polluted. No C & D waste from constructions, treated, covered or painted with materials, containing dangerous substances in significant amounts. +19 12 11 other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances. i.e. wastes specified under 19 12 12 will not include materials containing hazardous substances.		

Site Development and Phasing

2.1.2.6 The planned infill has been designed on the basis of extraction of sand and gravel to the underlying Oxford Clay. Infill material will be placed within former extraction phases as works progress across the Site. The infill area will ultimately total some 164 hectares (ha) areal extent.

2.1.2.7 Prior to placement of infill material, for each infill phase/sub-phase cell, a side wall lining will be created utilising Oxford Clay excavated from the base of the dig.

2.1.2.8 The excavated clay will be compacted to form the sidewalls for the inert infill area, providing an attenuating effect equivalent to a barrier of minimum permeability $1x10^{-7}$ metres per second (m/s) at 1m thickness[1].

2.1.2.9 The imported infill material used to facilitate the restoration landform, will comprise classified inert wastes from sources similar to the Hills operation at nearby Shorncote and Latton North Quarries. These will include wastes resultant from the Site mineral processing operation and primarily, imported waste soils and inert construction wastes, alongside some other inert waste materials, expected to be incapable of producing contaminating leachate.

2.1.2.10 The infill programme is to be undertaken as a waste Recovery Operation and is expected to be completed over a period of some 25 years.

Final Landform and Afteruse

2.1.2.11 Infilling will be made to facilitate the designed restoration landform. The restoration landform will comprise a combination of areas returned to original ground levels (returned to agriculture), alongside lower elevation areas, designed as rainfall runoff

[1] Landfill Directive (1999/31/EC) for inert waste.

attenuation features and/or areas for ecological enhancement. A copy of the proposed restoration is provided at *appendix 1*.

3 PATHWAY AND RECEPTOR

3.1 Geological Setting

3.1.1 Regional Geology

3.1.1.1 The geology of the Site and local area has been defined through consultation of the relevant 1:50,000 scale geological mapping data as published by the BGS, BGS drill records for the locality and previous assessment reports for sites in the local area. An extract of the relevant regional geological mapping data is presented at *figure 6*.

3.1.1.2 The Site is located in an area underlain by superficial sand and gravel deposits comprising the first terrace associated with the River Thames. These are present as a roughly east-west oriented band, following the route of the larger watercourses passing through the study area. Smaller deposits are also recorded along the routes of minor watercourses in the locality, generally north-south oriented, that link into the main drainage channels.

3.1.1.3 The solid strata underlying the sand and gravel comprise a series of Jurassic age units located on the northern limb of the regional London Basin. The solid strata outcrops as northeast-southwest oriented linear bands, reducing in age to the southeast.

3.1.1.4 An outline of the regional stratigraphic sequence for the area encompassing the Site is presented below at *table 5* and as a series of inferred cross sections for the locality (derived from the aforementioned BGS drill records and mapping data) at *figure 7*.

Table 5 Stratigraphic Sequence

Age	Formation		Description
Pleistocene & Recent	Alluvium		Clay, silt, sand and gravel. Variable deposition.
	River Terrace Deposits – Northmoor Sand and Gravel Member		Sands and gravels. Variable thickness on an undulating base (0.5 – 5m within Site). Pinches out to north of Site against the underlying Oxford Clay.
Jurassic	Oxford Clay Formation		Calcareous mudstone (sequence of clays and shales). Present in outcrop across extensive areas to the north of the Site and south of the River Thames at Cricklade. Present as a continuous unit of variable thickness, underlying the locality (overlain by drift deposits described above in the vicinity of the Site). Pinches out against the underlying Kellaways Formation some 2.3km to the northwest of the Site. Generally increases in thickness to southeast (full unit thickness some 150m at Swindon). Faulting of the unit results in a variable thickness, with drilling records in the vicinity indicating minimum thickness of between 11 and 30m present beneath the Site.
	Kellaways Formation	Kellaways Sand	An intermittent horizon of sandstone and siltstone. Drilling records indicate circa 10m thickness in locality.
		Kellaways Clay	Mudstone. Drill records indicate expected 4-10m vertical thickness in locality.
	Great Oolite Series	Cornbrash Formation	Limestone. Expected 4-6m thickness in locality. Present at some 40-81m below ground level at the Site.
		Forest Marble Formation	Silicate Mudstone with interbedded limestone (increased frequency of limestone units towards the base of the unit). Present at some 46-86mbgl in the vicinity of the Site.
		White Limestone Formation	Limestone – pale grey to off-white/yellowish peloidal wackestone/packstone with subordinate ooidal grainstones.

3.1.1.5 The BGS borehole data offer some contradictory information with regard to the depths/thicknesses of the geological units in the locality. The cross-sections have been drawn to shown the minimum thickness for Oxford Clay (and hence least thickness of barrier between the overlying sand and gravel and deeper aquifer units), in order to present the most sensitive case for subsequent impact assessment. The regional borehole data could equally be interpreted to show a much greater depth to the base of the Oxford Clay (and hence overall thickness).

3.1.1.6 Faulting is seen within the underlying solid geological units in the locality (*figure 6*). These are generally oriented north-south, resulting in a variable depth to individual units. The aforementioned borehole records suggest a significant thickening of Oxford Clay for the area to the southwest of the Site. Although this is not critical with regard to the proposed development, if the depth data are correct, the presence of an unmapped fault is suggested in the area to the southwest of the Site (perhaps a continuation of the mapped feature to the north).

3.1.2 Local Geology

3.1.2.1 The sand and gravel deposit underlying the Site is part of a laterally extensive deposit, encompassing the area to the east, west and south. The deposit pinches out close to the north of the Site, with the underlying Oxford Clay being recorded in outcrop.

3.1.2.2 An extensive drilling program has been undertaken at the Site to determine the nature and thickness of the superficial sand and gravel deposit. A plot depicting the base of the sand and gravel deposit (data provided by Brunel Surveys) is provided at *figure 8*.

3.1.2.3 The drilling data shows the thickness of sand and gravel to vary within the Site, the thickness being governed by the undulating upper surface of the Oxford Clay. The deepest recorded area of sand and gravel lies on the northwestern boundary of the Site, at some 5m thickness. The deposit is generally thinner to the south and within the eastern section of the Site, with areas of less than 0.5m thickness.

3.1.2.4 The drilling data indicate a generally consistent profile of 0.2-0.3m soil and 0.1-1.2m silt/clay (alluvium) overlying the sand and gravel deposit.

3.1.2.5 The solid strata of the Oxford Clay underlies the entirety of the Site. The Oxford Clay comprise calcareous mudstones as a sequence of compacted clays and shales and is present in outcrop across extensive areas to the north of the Site and south of the River Thames from Cricklade to Castle Eaton. The unit reduces in thickness generally to the northeast, eventually pinching out against the underlying Kellaways Clay strata some 1.5km from the Site boundary.

3.1.2.6 Deeper drilling in proximity to the Site indicates a minimum thickness for the Oxford Clay beneath the Site of some 11m at the west, increasing to some 30m to the east. This comprises a laterally extensive and continuous unit expected to separate the surface environment from other aquifer units at greater depth e.g., Cornbrash and White Limestone. Taking into account the Kellaways Formation underlying the Oxford Clay (sand and clay beds), this standoff increases to a minimum thickness of some 40m beneath the western section of the Site and 43m to the east.

3.1.2.7 Deposits of alluvium are recorded by BGS mapping data along the routes of the more significant drainage features in the locality. The closest area of identified deposition to the Site occurs adjacent to the Ampney Brook, some 100m to the southwest.

3.2 Hydrology

3.2.1 Hydrological Setting

Surface Watercourses

3.2.1.1 A plan depicting the surface watercourses for the area encompassing the Site is provided at *figure 9*.

3.2.1.2 The principal watercourse in the locality is the River Thames. This arises in the area some 13km to the west of the Site and flows generally eastwards through the study area.

3.2.1.3 In proximity to the Site the main river is joined by a series of relatively large watercourses – most notably (listed from upstream): River Churn, Ampney Brook, River Ray (from south), Marston Meysey Brook, Share Ditch (from south), Bydemill Brook (from south), River Coln and River Cole (from south). Of most relevance to the Site are the Ampney Brook and Marston Meysey Brook, which drain the area to the west, east and south of the Site.

3.2.1.4 Flow data is available for the Ampney Brook from the Sheepen Bridge EA gauging station located in the area downstream of the Site. The gauging station records a mean flow of some 0.739m^3/s (Q50: 0.487m^3/s, Q95: 0m^3/s). The flow data indicate that under extreme conditions the watercourse can cease to flow. This was last recorded to occur in 2011.

3.2.1.5 Flow data is available for the Marston Meysey Brook from the Whetstone Bridge EA gauging station located in the area downstream of the Site. The gauging station records a mean flow of some 0.208m3/s (Q50: 0.041m3/s, Q95: 0m3/s). As with the Ampney Brook, under extreme conditions the watercourse can cease to flow and this last occurred in the summer 2018 period.

3.2.1.6 In addition to the main watercourses draining the study area, the area encompassing the Site is drained by a series of minor (managed) drainage channels. The majority of these are ephemeral features, only active during periods of high groundwater levels or flood.

3.2.1.7 Local drainage is most prevalent within the lower lying area within the southern and eastern sections of the Site, where drainage is more critical to maximise land productivity. These drain to the southeast, linking either into the Marston Meysey Brook in the area downstream of the Whetstone Bridge gauging station, or directly to the River Thames, upstream of the confluence with the Marston Meysey Brook.

3.2.1.8 The most significant of the land drains with regard to the Site comprise managed features maintained to convey water from the central and eastern sections of the Site, connecting to the main drainage to the southeast.

3.2.1.9 Flows on the aforementioned features are assessed on a monthly basis as part of a baseline collection exercise. The flow data indicate an absence of active surface water

drainage from the western section of the Site with the exception of during more extreme flood conditions.

3.2.1.10 Surface drainage within the eastern section of the Site is focussed primarily to a drainage feature maintained to convey flow from both the catchment upstream of the Site and the area to the south of the former runway. This is to be maintained insitu throughout the life of the proposed development (located between Phases 1 and 2).

Surface Waterbodies

3.2.1.11 The presence and nature of surface waterbodies located within a 1km radius of the Site are highlighted on *figure 1 (appendix 2)*.

3.2.1.12 A total of 8 water features are recorded on OS mapping data within the survey radius. The majority were recorded as either being dry at the time of survey, waterbodies relating to the ongoing extraction operations in the locality or manmade lined tanks.

3.2.1.13 Two ponds expected to be naturally occurring were identified as present within the search radius, a large garden pond at a property south of Marston Meysey and the series of ponds at Ampney Pits LWS, located within the southern section of the Site.

Springs and Seepages

3.2.1.14 The presence and nature of springs and seepage areas located within a 1km radius of the Site are highlighted on *figure 1 (appendix 2)*.

3.2.1.15 A total of 2 wells and 1 spring are recorded on OS mapping data within the survey radius. The spring was recorded as dry at the time of survey. No access was possible to establish the status of the identified wells, but neither were visible at the points as indicated on the map and are hence expected to no longer be in existence/active.

3.2.2 Flooding

3.2.2.1 Data has been obtained from the EA (Flood Product 4) to determine the elevation and extent of areas vulnerable to surface flooding. A reproduction of the local EA fluvial flood mapping data is provided at *figure 10*. Areas are highlighted with an Annual Exceedance Probability of 1% (Return Period of 1:100-years: Flood Risk Zone [FRZ] 3) and AEP 0.1% (Return Period of 1:1,000-years [FRZ 2]).

3.2.2.2 The area encompassing the Site is of extremely low relief and as such, the area deemed at risk of fluvial flooding covers a relatively large area. The flood mapping data shows the lower lying areas to the south and east of the Site to be most vulnerable to flood risk. Flooding in this area is associated primarily with the Ampney Brook and Marston Meysey Brook.

3.2.2.3 The higher ground forming the central, northern and western sections of the Site resides outside the defined area of fluvial flood risk (designated as FRZ1). The flood mapping data indicates areas of the proposed extraction in the eastern/southeastern sections of the Site reside within both the FRZ2 and FRZ3 areas.

3.2.3 Surface Water Quality

3.2.3.1 Available surface water quality data for the for the principal watercourses located in proximity to the site have been obtained from the EA. The data are summarised as maximum, minimum and average values at *table 6*.

Table 6 Surface water quality data

	Ampney Brook at Sheepen Bridge			River Thames at Westmill GS		
	Max	Min	Ave	Max	Min	Ave
pH	8.5	6.8	8.1	8.9	7.3	8.1
Conductivity, uS/cm	621.0	331.0	568.9	547.0	427.0	509.4
Temperature,oC	21.4	2.8	10.9	23.2	1.0	11.3
Condictivity, uS/cm	686.0	317.0	583.5	610.0	269.0	498.9
BOD, mg/l	12.5	0.0	0.8	6.6	0.0	1.0
COD, mg/l				19.8	0.0	9.2
Cadmium, ug/l	0.0	0.0	0.0	2.5	0.9	1.7
Ammonia(N), mg/l	2.7	0.0	0.0	3.3	0.0	0.0
N Oxidised, mg/l	24.6	4.6	9.9	15.4	0.0	5.1
Nitrate-N, mg/l	24.6	4.5	8.3	8.4	0.0	4.8
Nitrite-N, mg/l	0.2	0.0	0.0	0.1	0.0	0.0
NH3 un-ion, mg/l	0.0	0.0	0.0	0.1	0.0	0.0
Sus Solids@105C, mg/l	81.4	0.0	6.7	180.0	0.0	9.1
Hardness, mg/l	433.0	232.0	324.5	346.0	94.0	250.8
Alkalinity pH 4_5, mg/l	312.0	126.0	234.7	316.0	79.0	186.4
Chloride Ion, mg/l	60.0	16.5	25.7	125.0	11.0	24.0
Orthophosphate, mg/l	0.7	0.0	0.1	0.9	0.0	0.0
Silica, mg/l	6.8	3.4	5.0	6.7	0.1	3.9
Magnesium, mg/l				4.6	3.3	4.1
Calcium, mg/l	159.0	101.0	122.2	110.0	61.9	93.1
Phosphorus, mg/l				0.1	0.0	0.0
Oil & Grease, visual	0.0	0.0	0.0	0.0	0.0	0.0
Chromium, ug/l	0.0	0.0	0.0	0.0	0.0	0.0
pH in-situ, PHUNITS	8.5	7.9	8.2	8.6	7.8	8.3
Copper filtered, ug/l	4.4	0.0	1.1	20.0	0.0	0.7
Copper, ug/l	14.8	0.0	1.7	12.0	0.0	1.2
Zinc, ug/l	59.0	0.0	3.0	109.0	0.0	6.0
Nickel, ug/l	0.0	0.0	0.0	0.0	0.0	0.0
Ammonia Total, mg/l	10.8	5.9	8.4	12.5	0.7	5.6
Dissolved Oxygen, %	135.0	32.0	94.0	140.0	11.8	98.6
Dissolved Oxygen, mg/l	14.8	3.6	10.4	15.7	4.1	10.8

3.2.3.2 The period of data available for each monitoring point varies with dataset, from 1973 for the Thames and 1982 for the Ampney Brook.

3.2.3.3 The data suggest the Ampney Brook and Thames to record generally elevated electrical conductivity readings, indicating abundant dissolved mineralogy to be present.

3.2.3.4 Levels of nitrate are highest within the Ampney Brook, but also remain elevated within the main river. Such elevated nitrate concentrations are commonly seen in areas dominated by arable agriculture and subject to widespread application of fertilisers.

3.2.3.5 Surface water quality data is in addition collected by Hills for the primary drainage features located down hydraulic gradient of the Site (SW1 – SW4, *appendix 1, figure 1*). Water quality samples at these locations has been collected since February 2019. The collected data are summarised as at *table 7* as maximum, minimum and average values for a selected number of representative chemical species established from the data, together with the most relevant Regulatory Water Quality Standard (RWQS). The full water quality dataset is included at *appendix 4*.

3.2.3.6 As described above, drainage away from the principal features in proximity to the Site are generally ephemeral (SW1 and SW3). As a consequence, samples from these features are only possible during winter months.

3.2.3.7 The collected data reflect similar quality to the main watercourses (*table 6*) and groundwater samples, recording elevated levels of nitrogen compounds (nitrate /ammoniacal nitrogen), as well as manganese. It is also of note that the water quality recorded within pond SW4 (Ampney Pits LWS) is identified as of poor quality, being elevated in nitrogen-based compounds, manganese, sulphate and phosphate. This is considered reflective of the offline nature of the waterbody from main drainage and manmade influence, through use as a base for feeding wildfowl and pheasants for local shoots.

3.2.4 Ecological Importance & Quality of Surface Water Features

3.2.4.1 The Site is located within the Thames Upper Catchment of the Thames River Basin District.

3.2.4.2 This catchment is the western most area within the Thames River Basin District and is drained by a series of northwest – southeast oriented watercourses, linking into the main east–west River Thames, which runs centrally through the catchment area.

3.2.4.3 Surface water quality for the Ampney Brook (located west of the Site) as recorded under the DEFRA river basin management classification system, is Moderate (ecological) to Good (chemical) – a classification of Moderate overall. The catchment data does list the Ampney Brook as recording pressures relating to groundwater resources, but no objectives are listed as being currently required.

3.2.4.4 Surface water quality for the Marston Meysey Brook is recorded as Good (ecological) and Good (chemical) – a classification of Good overall and no objectives set requiring action.

Table 7 Surface water quality data

Chemical species	RWQS (mg/l)	SW1 (Adj Roundhouse Quarry)			SW2 (Main watercourse Whetstone Bridge)			SW3 (Gally Leaze Bridge)			SW4 (Ampney Pits LWS)		
		Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
Ammonia (Free) as N	0.25-9	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.02	0.10	<0.02	0.06
Arsenic as (Dissolved)	0.01	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.005	<0.001	0.002
Cadmium as Cd (Dissolved)	0.0001	0.00003	<0.00002	<0.00002	0.00007	<0.00002	0.00004	0.00010	<0.00002	<0.00002	0.00005	<0.00002	0.00003
Copper as Cu (Dissolved)	2	0.002	<0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001	0.002	<0.001	<0.001
Lead as Pb (Dissolved)	0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.000	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese as Mn (Dissolved)	0.123	0.004	<0.002	0.004	0.009	<0.002	0.005	0.530	<0.002	0.095	0.982	<0.002	0.188
Mercury as Hg (Dissolved)	0.001	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Nickel as Ni (Dissolved)	0.02	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.001	<0.001
Zinc as Zn (Dissolved)	5	0.020	<0.002	0.010	0.040	<0.002	0.012	0.013	<0.002	<0.002	0.100	<0.002	0.016
Calcium as Ca (Dissolved)	-	158	68	134	160	72	130	205	95	139	258	87	141
Iron as Fe (Dissolved)	0.2-2	0.13	<0.01	0.06	0.20	<0.01	0.09	0.14	<0.01	0.03	0.87	<0.01	0.16
Magnesium as Mg (Dissolved)	-	5.0	2.0	3.2	5.0	3.0	4.1	6.0	3.0	3.4	9.0	2.0	4.5
Potassium as K (Dissolved)	-	9.0	<1	4.2	12.0	2.0	7.7	11.0	1.0	2.7	20.0	1.0	6.4
Sodium as Na (Dissolved)	200	49	9	21	173	9	36	25	7	12	29	4	13
Total Sulphur as SO4 (Dissolved)	250	38	5	25	35	5	27	98	4	27	395	<3	51
Fluoride as F	1.5	0.4	0.1	0.2	1.7	0.1	0.4	0.3	0.1	0.1	0.2	0.1	0.2
Ammoniacal Nitrogen as N	0.5	0.50	<0.01	0.09	0.14	<0.01	0.04	0.30	<0.01	0.06	6.00	<0.01	0.88
Chloride as Cl	250	70	14	28	174	6	41	31	4	18	54	5	23
Nitrate as N	50	22.3	<0.2	13.6	25.0	<0.2	11.8	14.9	<0.2	5.3	5.2	<0.2	2.6
Nitrite as N	0.01	0.82	<0.01	0.10	0.45	<0.01	0.07	0.12	<0.01	0.04	0.19	<0.01	0.05
Phosphate as P	0.5-0.7	0.02	<0.01	0.02	0.03	<0.01	0.03	0.07	<0.01	0.03	1.12	<0.01	0.34
Total Oxidised Nitrogen as N	-	18.0	11.9	14.7	18.2	9.6	12.7	15.0	5.2	9.7	0.7	<0.2	0.7
Total PAH (Sum of USEPA 16)	0.00001	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Phenol	0.0005	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Orthophosphate as PO4	0.5-0.7	0.11	<0.03	0.06	0.84	<0.03	0.12	1.35	<0.03	0.21	3.43	<0.03	0.82
Cyanide (Total) as CN	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH GC	0.3	0.02	<0.01	0.02	0.04	<0.01	0.03	0.04	<0.01	0.04	0.04	<0.01	0.04

	RWQS (mg/l)	SW1 (Adj Roundhouse Quarry)			SW2 (Main watercourse Whetstone Bridge)			SW3 (Gally Leaze Bridge)			SW4 (Ampney Pits LWS)		
		Max	Min	Ave	Max	Min	Ave	Max	Min	Ave	Max	Min	Ave
Chemical Oxygen Demand (Settled)	-	18	<5	10	22	<5	8	42	<5	11	55	6	24
Bicarbonate Alkalinity as CaCO3	-	296	165	233	305	138	257	489	197	283	453	157	263
Carbonate Alkalinity as CaCO3	-	22	0	5	20	0	6	13	0	3	11	0	2
Total Alkalinity as CaCO3	-	296	165	236	305	0	250	489	197	285	453	0	237
Total Organic Carbon	-	7.4	1.1	2.9	7.4	1.3	2.5	16.0	2.1	4.0	20.0	1.4	8.7
Total Acidity as CaCO3	-	2	2	2	255	255	255	0	0	#DIV/0!	297	274	286
Conductivity uS/cm @ 25C	1	844	459	679	1190	449	745	936	466	650	1160	429	680
Biochemical Oxygen Demand	2.5-15	23.0	<1.0	7.0	2.0	<1.0	1.4	4.3	<1.0	2.4	16.3	<1.0	5.4
pH units	n/a	8.1	7.2	7.7	8.2	7.3	7.8	8.1	7.5	7.8	8.1	7.1	7.7

3.3 Hydrogeology

3.3.1 Aquifer characteristics

Aquifer classification

3.3.1.1 The superficial sand and gravel deposits (underlying and encompassing the Site) are designated by the EA as a 'Secondary A Aquifer' (formerly referred to as 'minor aquifers'). These are defined as permeable layers capable of supporting local abstraction and in some cases providing a component of baseflow to local watercourses.

3.3.1.2 The underlying solid strata of the Oxford Clay is regarded as non-aquifer ("unproductive strata" under the EA classification scheme), possessing low permeability and negligible potential for water supply or river base flow.

3.3.1.3 The Oxford Clay overlies an intermittent layer of the Kellaways Sand. In the vicinity of the Site this is seen as isolated outcrop area some 2km to the northwest of the Site, pinching out against outcrop of the underlying Kellaways Clay. The Kellaways Clay comprises mudstone and is classified as non-aquifer.

3.3.1.4 The limestone Cornbrash underlies the Kellaways Clay and comprises a further Secondary A Aquifer, which overlies the Forest Marble Formation. The upper section of the Forest Marble is dominated by mudstone with subordinate limestone beds and is regarded as non-aquifer. The prevalence of limestone increases with depth, with the lower levels having some minor potential for abstraction but largely in combination with other underlying limestone units. The Forest Marble is underlain by the White Limestone Formation and subsequent Taynton Limestone Formation. These are both classified as a Principal Aquifer, being locally exploited for public water supply abstraction.

3.3.1.5 The presence of the combined continuous surface of low permeability Oxford Clay and subsequent Kellaways Clay, serves to isolate the shallow superficial sand and gravel aquifer from the deeper Cornbrash and Principal Aquifers in the locality and resulting in confined groundwater conditions within the underlying Principal Aquifer.

3.3.1.6 Groundwater levels recorded within the Principal Aquifer in proximity to the Site (EA Down Ampney OBH monitoring point) indicate a strong upward gradient from the confined aquifer, with levels varying from some 30m below ground, to occasional artesian conditions. This compares with groundwater levels recorded within the shallow sand and gravel aquifer in close proximity to the aforementioned location (BH2) of between 2 – 3 metres below ground, with variation recorded as largely independent of changes within the Principal Aquifer.

Groundwater Flow Mechanism

3.3.1.7 The near surface superficial deposits principally comprise sands and gravels. Groundwater movement through the deposit occurs within the interconnected system

of pore-spaces as intergranular groundwater flow (which can be approximated mathematically using the idealised model as described by Darcy[2]).

3.3.1.8 The rate of transfer for groundwater through the superficial aquifer will depend on the gradient on the watertable, the cross-sectional area and the hydraulic conductivity of the deposit. These are defined from the Site piezometer network and hydraulic testing conducted as part of this assessment and are discussed in greater detail below.

3.3.1.9 In areas where alluvium and terrace deposits of differing age and composition are overlain, there is a possibility that vertical differentiation (or layering) of aquifer properties exists.

3.3.1.10 Where layering exists, this may be associated with the development of "perched" groundwater lenses and vertical impedance of groundwater flow. However, such features are anticipated to be of significance only at a very localised scale.

3.3.1.11 At Site scale, the superficial deposits are considered to be in hydraulic continuity, thus forming a single groundwater body.

3.3.1.12 Areas of older, isolated terrace deposits located on outcrops of Oxford Clay are present outside the Site. Such deposits are considered to be hydraulically isolated from the lower terrace deposits (including those of the Site) and thus not in continuity with the bulk of the sand and gravel aquifer.

3.3.1.13 The unproductive strata of the Oxford Clay (and underlying Kellaways Clay) will not support groundwater flow but will act as an impermeable aquiclude to groundwater movement and provide confined groundwater conditions within the underlying Principal Aquifer.

Aquifer Distribution and Boundaries

3.3.1.14 Within the Site, the sand and gravel aquifer is present immediately below thin soil cover. The upper surface of the aquifer thus forms an unconfined recharge boundary for downward percolation of rainfall.

3.3.1.15 The sand and gravel aquifer of the Site and surrounding area directly overlies Oxford Clay, which forms the lower boundary of the superficial aquifer.

3.3.1.16 The lateral boundaries of the sand and gravel aquifer to the north, east and south are determined by the limit of distribution, defined as where the sand and gravel pinches out against the underlying Oxford Clay outcrop area. At the closest approach, this occurs immediately adjacent to the northern boundary of the Site, some 1km to the northeast of the Site and 750m to the south.

3.3.1.17 The lateral boundary to the west is effectively unlimited at the scale of interest for assessment, extending into the large area of sand and gravel deposition around which the Cotswold Water Park has been formed.

3.3.1.18 On a local scale, the sand and gravel aquifer is expected to be in hydraulic continuity with the major local watercourses passing through the area (Ampney Brook, Marston

2 "Les Fontaines Publiques de la Ville de Dijon" (The Public Fountains of the City of Dijon), Darcy, H.,1856, Dalmont, Paris

Meysey Brook and River Thames). The watercourses are thus expected to form both terminal and interior boundaries to the local aquifer system.

3.3.1.19 The Ampney Brook to the west of the Site, and the Marston Meysey Brook to the east, both locally flow from north to south, linking into the main River Thames in the southern section of the study area. These are significant watercourses draining relatively large areas to the north and the local sand and gravel aquifer where this is in contact. Local to the Site, the watercourses form the respective western and eastern boundaries of the local sand and gravel aquifer.

Aquifer Recharge

3.3.1.20 The sand and gravel deposit encompassing the Site comprises an unconfined aquifer fed primarily from incident rainfall (autogenic recharge).

3.3.1.21 Examination of the local topography indicates that recharge to the aquifer within the Site, from runoff falling on areas of adjacent Oxford Clay outcrop (allogenic recharge) is unlikely to provide a significant contribution to the local aquifer resource.

Aquifer Properties

3.3.1.22 Aquifer properties describe the rate at which groundwater may be transmitted through a rock body (hydraulic conductivity / transmissivity) and the water storage potential of the system (storage).

3.3.1.23 On the basis of the analysis conducted for the deposit within the Site, a representative value for aquifer hydraulic conductivity has been defined as 67m/d. This is equivalent to the maximum value derived from testing – as presented with the HRA and H&HIA.

3.3.1.24 In order to provide a robust assessment with regard to the calculations for potential rates of groundwater ingress, radius of influence and drawdown for the proposed development, an additional 'maximum' value of some 156m/d has been used for subsequent impact assessment. This is equivalent to the maximum value specified within other assessment reports produced in the locality (Whetstone and Eysey Manor Quarry reports). The 'maximum value' is more than an order of magnitude greater than the average value calculated for the Site sand and gravel deposit.

3.3.1.25 A review of published data to establish the potential range in hydraulic conductivity values for the various solid strata units underlying the Site has also been undertaken. The available data indicate a representative value for hydraulic conductivity of the Oxford Clay of less than $1x10^{-9}$ m/s, but recorded ranges between $5x10^{-11}$ and $1.2x10^{-5}$m/s. For the Kellaways Clay the available data suggests a range between $1.2x10^{-9}$ and $4.7x10^{-9}$ m/s, and for the Kellaways Sand between $1x10^{-6}$ and $1x10^{-8}$ m/s.

3.3.1.26 Reported Transmissivity values for the Principal Aquifer range from 5,900 m^2/d to 4m^2/d, around a representative geometric mean of some 212m^2/d.

3.3.2 Water Abstractions

Licenced Abstractions

3.3.2.1 Information concerning licensed groundwater abstractions for the locality has been obtained from the EA licence database. Details of licensed abstractions within the

survey area (extending 2km from the Site boundary) are shown at *table 8*. The locations of all abstractions are shown in *figure 11*.

Table 8 Licensed Abstractions

Map Code	Licence Number	Licence Holder	Source	Purpose
AB1	28/39/05/0039	Thames Water Utilities Limited	Meysey Hampton Boreholes GW - Inferior Oolite	Public water supply
AB2 & AB3	28/39/05/0045/R01	Thames Water Utilities Limited	Meysey Hampton Boreholes GW – Greater Oolite	Public water supply
AB4 – AB7	28/39/02/0010	Thames Water Utilities Limited	Manor Farm Boreholes GW - Inferior Oolite	Public water supply

GW: Groundwater, SW: Surface Water

3.3.2.2 Abstraction AB1, AB2 and AB3 relates to Thames Water Utilities Limited (TWUL) Meysey Hampton groundwater sources, located between Down Ampney and Meysey Hampton (some 1.7km north of the Site).

3.3.2.3 The aquifers supporting the abstractions is stated as the Inferior Oolite and Greater Oolite. The Inferior Oolite is located below both the Kellaways Formation and Great Oolite Series (Cornbrash, Forest Marble and Fullers Earth) at the Site. Local borehole records indicate the Greater Oolite is located some 7m below ground level in the vicinity of the abstraction and the Inferior Oolite some 90m below ground level (Meysey Hampton OBH borehole). The abstraction is made in an area underlain by the Kellaways Clay Formation, immediately to the north of the Oxford Clay outcrop area that underlies the Airfield Quarry Site.

3.3.2.4 Abstractions AB4 – AB7 relates to further TWUL abstraction made from the groundwater sources at Manor Farm, Latton (2.5km east of the Site). The aquifer supporting the abstractions is again stated as the Inferior Oolite. Geological logs for abstraction boreholes at the Site show a similar setting to the Meysey Hampton abstractions (separated from the Site by the underlying Oxford Clay/Kellaways Formation), with borehole depths ranging from 60 to 82m and abstraction made from the lower beds.

3.3.2.5 Both the aforementioned abstractions have Source Protection Zones defined and these are discussed further below.

De-regulated Abstractions

3.3.2.6 Data has been obtained from Cotswold District Council (CDC) and Wiltshire Council (WC), summarising deregulated abstractions located within the study area (extending 2km from the Site boundary). The location of these abstractions are shown at *figure 11* with outline details presented below at *table 9*. All identified abstractions have been contacted as part of this assessment to obtain up to date status with regard to use.

Table 9 De-regulated Abstractions				
Map Code	Licence Ref.	Licence Holder	Source	Purpose
PWS1	P125215	The Kennels, Meysey Hampton	Borehole (74m deep – cased to some 25mbgl). Abstraction from Forest Marble.	Private domestic and watering animals/wash-down etc
PWS2	P125250	Peasburge Barn, Down Ampney	Borehole (59m deep – cased to some 11mbgl). Abstraction from Forest Marble.	Private domestic
PWS3	P125029	Poulton Hill Farmhouse, Down Ampney	Borehole abstraction (64m deep - cased to some 50mbgl). Abstraction from Forest Marble.	Not used
GW: Groundwater, SW: Surface Water				

3.3.2.7 There are no Private Water Supply abstractions made from the sand and gravel aquifer located within a 2km radius of the Site boundary. All identified abstractions (that remain in operation) are made from boreholes installed into the Great Oolite Series or underlying strata and are hence separated from the Site by the presence of the overlying Oxford Clay.

Source Protection Zones

3.3.2.8 EA designated groundwater Source Protection Zones (SPZs) in the vicinity of the Site are illustrated at *figure 12*.

3.3.2.9 The Site lies within the defined catchment for the Meysey Hampton public water supply boreholes (AB1-AB3 on *figure 11*). Zone boundaries cross the Site in a roughly east/west direction, such that the southern third of the Site lies within the SPZ3 (Total Catchment, the central section falls within SPZ 2 (Outer Zone) and the northern section within SPZ1 (Inner Zone).

Vertical boundaries & treatment of aquitard units by SPZ mapping

3.3.2.10 UK SPZ mapping does not consider potential subsurface aquitards that may serve to isolate abstraction made at depth, from near surface permeable geological units. Consideration is made for areas where non-aquifer is identified in outcrop and these areas are omitted from SPZ, accepting that hydraulic separation exists between the surface and any underlying aquifers.

3.3.2.11 If an aquifer is identified at the ground surface falling within an SPZ, it is assumed this is in continuity with groundwater abstraction, ignoring the presence of any subsurface aquitard units separating the exploited aquifer.

3.3.2.12 In the vicinity of the Site, the geological units underlying the near surface sand and gravel (an expected minimum of some 40m thickness of combined Oxford Clay and Kellaways Formation) are expected to provide a strong degree of separation between the PWS abstraction made from the Inferior Oolite and the near surface shallow aquifer (*sections 3.1.2/3.3.1* above)

3.3.2.13 Based on the foregoing it is apparent that although the Site is deemed to be located within the SPZ for the PWS abstraction, the geological succession underlying the Site will provide a laterally continuous and natural hydraulic barrier between the two groundwater regimes, serving to isolate the proposed development from the groundwater environment supporting the PWS abstractions.

3.3.3 Groundwater Levels, Flow and Surface Water Interaction

Groundwater Levels

3.3.3.1 Groundwater levels within the sand and gravel aquifer encompassing the Site are recorded at total of 19-no. piezometers. Twelve piezometers are installed within the Site boundary and a further seven are installed within the surrounding area. All piezometer locations have been accurately surveyed to facilitate reduction of collected groundwater data to Ordnance Datum. The locations for the installed monitoring points are shown on *figure 13*.

3.3.3.2 Monitoring has been undertaken at the Site since 2006. Groundwater levels were initially recorded at twelve piezometers (P1 - P7, P9 - P12) for the period 2006 – 2015 before being suspended. Monitoring was recommenced in 2017 by the applicant and the scheme was extended in September 2018, to include a further nine piezometers installed around the Site perimeter. These were located to monitor groundwater levels up and down hydraulic gradient of the Site and to enable collection of baseline water quality data for future Environmental Permitting requirements (P1_18 – P9_18).

3.3.3.3 Under maximum groundwater elevation conditions, groundwater levels vary from a peak of some 80.75maOD along the northwestern section of the Site, reducing to some 76.9maOD at the southwestern boundary.

3.3.3.4 Under minimum groundwater elevation conditions, groundwater levels vary from a peak of some 79.5maOD along the northwestern section of the Site, reducing to some 75.5maOD at the southwestern boundary.

Groundwater Flow

3.3.3.5 The collected groundwater data has been used to prepare a series of contour plots for groundwater levels through the Site. Interpolated contour plots illustrating representative minimum (data recorded on 28th August 2021) and maximum (data recorded on 31st October 2019) groundwater elevations through the Site are shown at *figures 14* and *15*. These indicate a general southeasterly direction of groundwater flow under both maximum and minimum conditions.

3.3.3.6 The groundwater flow directions described above, accord with the local surface water drainage patterns draining primarily towards the southeast and tributary drainage associated with the River Thames/Marston Meysey Brook.

3.3.3.7 The groundwater contour plots indicate an overall head gradient through the Site of some 0.003 for both maximum and minimum groundwater elevation conditions.

Groundwater flow rate

3.3.3.8 The rate of groundwater flow through the Site has been estimated using Darcy's fundamental groundwater flow equation.

3.3.3.9 Adopting the representative hydraulic conductivity of 67m/d, a groundwater gradient of 0.003, a length for the extraction area perpendicular to flow direction some 1,450m and an average saturated thickness of 1.9m (Phases 3, 4, 5 and 6), yields a groundwater flow rate through the Site of some 554m^3/d (equivalent to some 6l/s).

Local groundwater and surface water interaction

3.3.3.10 The groundwater and other Site-specific assessment data indicates the local drainage network to be gaining from groundwater discharge to the surface water environment during the winter period. During summer periods this transfer drops significantly, with the saturated thickness of the aquifer naturally reducing and the majority of local drainage features and ponds drying out (ephemeral features). Under extreme dry hydrometric conditions, this can extend to the larger watercourses (the Ampney and Marston Meysey Brooks).

3.3.3.11 Assessment of flows up and downstream of the Site, on the drainage feature 6:S – 37:S (*figure 1 – appendix 2*), records a general gain in flow from the eastern section of the Site of some 30 litres/second (l/s) during the winter period (non-flood periods), reducing to some 5l/s during summer periods.

3.3.4 Groundwater Elevations Relative to the Recovery Operation

3.3.4.1 The sand and gravel extraction operation at the Site is to be worked to the full depth of the deposit and will therefore require sub-watertable working facilitated by a program of dewatering. The Recovery Operation will therefore place material below the watertable to the full saturated thickness of the extant aquifer, to ensure a dry restoration landform.

3.3.4.2 Comparison of maximum and minimum groundwater elevation levels recorded within the collected dataset, with the base of deposit information derived from the Site drilling data, indicates that saturated thickness to vary from zero at points where the underlying Oxford Clay rises across the central section of the Site, to a maximum of more than 3.5m in the northern section, on the northwestern boundary and within the lower lying area in the southern section of the Site.

3.4 Man Made Sub-Surface Pathways

3.4.1 There are no known man-made sub-surface pathways within or in proximity to the Site.

3.5 Receptors and Compliance Points

3.5.1 Groundwater

3.5.1.1 Groundwater within the sand and gravel (Secondary A Aquifer) encompassing the Site is identified as the primary receptor for any contaminant release from the Recovery Operation, with the Point of Compliance (POC) selected as being piezometers P2_18 and P3_18 (*figure 16*), which are located immediately upon the down gradient (southern) boundary of the Site.

3.5.2 Surface Water

3.5.2.1 As described above any movement of contaminant from the Recovery Operation will pass into the encompassing sand and gravel aquifer, prior to any release into the surface water environment. This notwithstanding, in order to provide a robust monitoring programme, Control and Compliance Levels are also proposed for surface water monitoring point 37:S (from here referred to as WC1 – *figure 16*). This is the closest surface water drainage feature located downstream of the proposed infill area.

3.5.3 Amenity (Nuisance and Health)

Receptors

3.5.3.1 There are a number of potentially sensitive receptors in proximity to Airfield Quarry, including Controlled Waters, a variety of woodland habitats, Fairford Airbase and isolated residential properties.

3.5.3.2 These have each been assessed within the Environmental Statement submitted as part of planning application. The various specialist assessments have demonstrated that, with appropriate controls and mitigation measures specified within the ES to manage various aspects of the development, the risk to receptors from the proposed Recovery Operation is low.

Safeguarded Aerodromes

3.5.3.3 The Site is located within the 13km bird strike safeguarding zone associated with Fairford Airbase. Due to the proximity of the airbase and perceived risk of birdlife to the operation of aircraft from the base, the proposed development has included a Wildlife Hazard Management Plan (WHMP).

3.5.3.4 The WHMP has been developed to ensure no additional birdlife is attached to the Site during extraction and infilling operations and to reduce the presence of bird species with the potential to threaten operations at the airbase. The WHMP will be operated under a Section 106 Agreement for the Site, throughout the duration of the proposed development, through to restoration (and in perpetuity if it is proved necessary).

3.5.3.5 It is of note that the restoration for the Site has been designed to comprise a dry landform (requiring the inert infill element of the development), to prevent attraction of any additional birdlife to open water areas.

Habitats

3.5.3.6 An Ecological Assessment (EAss) has been completed as part of the planning application prepared for the Site[3]. This has demonstrated that adverse ecological impacts have been effectively removed or adequately reduced, by the proposed Site design, layout and operation.

3.5.3.7 Furthermore, the EAss finds that for the restoration of the Site (facilitated by the proposed Recovery Operation), the landform '*will serve to enhance the habitat for a variety of notable/priority species in the medium to long term*'.

[3] Airfield Quarry, Galley Leaze – Environmental Statement Chapter 8: Ecology, 6th May 2020, AD Ecology Limited.

4 POLLUTION CONTROL MEASURES

4.1 Site Engineering

4.1.1 Basal and Side Slope Engineering

4.1.1 The Recovery Operation is to be constructed upon the basis of engineered containment, and thus requires an EBS with an attenuating effect equivalent to $1x10^{-7}$ m/s at 1m thickness, with liner thickness being determined by the permeability of the available lining materials (The Design Standard), upon the base and sidewalls of the Recovery Operation.

4.1.2 It is proposed that the sidewall lining of the Recovery Operation be formed using the basal clays native to the Site (Oxford Clay).

4.1.3 Given the range in permeability observed for the Oxford Clay (*section 3.3.1* - ranges between $5x10^{-11}$ and $1.2x10^{-5}$m/s), it is considered that through careful selection of liner material from the base of works, and through its compaction, the attainment of a sidewall liner of significantly lower permeability than the Design Standard can be readily achieved.

4.1.4 Due to the practical limitations of liner creation, it is however considered that a liner of a thickness of at least 1m is required to ensure initial stability and correct function.

4.1.5 The basal lining of the Recovery Operation will be formed by the in-situ Oxford Clay present within the base of works, which will be compacted prior to the deposition of infill materials.

4.1.6 With the intended compaction of the upper surface of the basal clay and expected low vertical permeability, it is considered that the basal liner will achieve an attenuating capacity in excess of that for the sidewall liner (due to the significantly greater thickness).

4.1.2 Capping

4.1.2.1 The Site is to be completed without use of engineered capping. The waste mass is to be topped with soils native to the Site only.

4.1.2.2 The Site is to receive solely inert waste materials which are expected to be of low permeability/non-degradable and hence will not require landfill gas or leachate management.

4.2 Restoration

4.2.1 Pollution control measures further to those described above are not considered to be required as part of the restoration of the Site.

4.2.2 The land surrounding the proposed infill areas is extremely flat and there is to be no raising of land above surrounding ground levels. It is therefore apparent that placed material and capping soils will be contained by the adjacent land, with no side slopes that could give rise to potential for subsidence.

4.2.3 Additionally, the nature of quarry restoration using inert materials does not usually give rise to differential settlement to such a degree that any more than routine works are

required to address. Topographical surveys on closure of the Site or surrender of the EP will confirm this.

4.3 Surface Water Management

4.3.1 Current Surface Water Management

4.3.1.1 Rainfall incident within the current Site is either infiltrated to the underlying sand and gravel aquifer, or conveyed as runoff via a series of managed drainage channels, which transfer any accumulating water to the west and south of the Site.

4.3.2 Proposed Surface Water Management

4.3.2.1 A surface water management scheme has been set out within the planning application for the Site. This includes for both the active phase of operations (extraction and infilling) and restoration of the Site. A summary of the proposed scheme is provided below.

Active phase of operations

4.3.2.2 A dewatering operation will be maintained within the active sections of the Site to facilitate dry working conditions for the extraction of mineral and subsequent infill placement.

4.3.2.3 Dewatering will be undertaken on a phased basis. Following completion of extraction and restoration within each phase, dewatering within that phase will cease.

4.3.2.4 Groundwater ingress to the excavations will be directed via a network of shallow drainage grips, excavated into the underlying Oxford Clay, to collector sumps located within each phase.

4.3.2.5 Water accumulating within the collector sumps will be pumped via water treatment areas for removal of suspended solids content, to the local surface water drainage network. Any such off-site discharge will require Environment Agency Consent (Environmental Permit for a Water Discharge Activity) and will need to comply with any related conditions stipulated for water quality. A schematic water management plan for the active phase of working is provided at *figure 17*.

4.3.2.6 The proposed development includes for selected areas of clay lining along phase boundaries to be installed, prior to the commencement of dewatering operations. These are specified to ameliorate drawdown associated with the dewatering operation, extending towards identified local receptors.

4.3.2.7 As extractive works progress, the clay lining will be extended to form the lateral lining for infill placement. Each phase will be subdivided by a low clay bund (or excavated drainage) formed to ensure runoff from the infill placement area is not allowed to drain to unlined phases during mineral extraction.

4.3.2.8 Rainfall runoff from the infill placement area will be collected and pumped to the Site settlement and attenuation lagoons, located adjacent to the Plant Area. Water within these lagoons will be circulated to the Site mineral washing plant, with any excess discharged offsite to existing drainage to the south (and ultimately to the River Thames).

Restoration

4.3.2.9 The surface water management scheme for the restored Site includes a variety of elements, included to ensure continued movement of surface water and groundwater through the locality and management of runoff rates from within the Site to ensure no increase in prevailing Greenfield Runoff Rates.

4.3.2.10 The Site restoration includes retention of existing drainage passing through the Site, inclusion of additional perimeter an internal surface drainage, connection of gravel pathways and provision of temporary runoff attenuation areas. A summary plan presenting the surface water drainage scheme for the restored Site is presented at *figure 18*.

4.4 Post-Closure Controls

4.4.1 Monitoring and Maintenance

4.4.1.1 The Recovery Operation is to be completed without need for any long-term active management systems including leachate or gas control measures. Associated monitoring and maintenance is thus not required.

4.4.1.2 The HRA specifies requirements for control and compliance monitoring to be undertaken, in conjunction with wider surveillance monitoring, with regard to groundwater / surface water, levels and quality.

4.4.1.3 The full set of the baseline groundwater quality data collected at the Site are included at *appendix 4*. The baseline data have been used to define suitable Control and Compliance levels for selected monitoring points at the Site.

4.4.1.4 HRA requirements for continued water quality monitoring are presented at *table 10*, with control levels / compliance limits being specified for the selected relevant monitoring points/locations at *table 11*.

Table 10 Proposed Monitoring

Location (*figure 8*)	Purpose	Monitoring Requirements	Frequency
P1_18, P2_18*, P3_18*, P4_18 and WC1*.	Control and compliance monitoring. Surveillance monitoring, down hydraulic gradient groundwater and surface water.	<u>Field Determinands:</u> Water elevation, pH, temperature and electrical conductivity. <u>Laboratory Determinands:</u> Ammoniacal Nitrogen, Arsenic, Lead, Mercury and Sulphate.	Quarterly sampling Monthly water level measurement
		<u>Additional Laboratory Determinands:</u> Antimony, Barium, Cadmium, Calcium, Chloride, Chromium, Copper, Dissolved Organic Carbon, Fluoride, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Phenols, Nitrate, Nitrite, Selenium, Sodium, Total Dissolved Solids, Total Alkalinity, Total Petroleum Hydrocarbons.	Annual
P5_18 – P9_18 and P1 – P10	Surveillance monitoring,	Water elevation	Monthly
*Control and Compliance monitoring point subject to associated limits described at *table 11*			

Table 11 Control Levels and Compliance Limits						
Chemical	Control Level			Compliance Limit		
	P2_18	P3_18	WC1	P2_18	P3_18	WC1
Arsenic	0.005	0.005	0.005	0.005	0.005	0.005
Ammoniacal nitrogen	0.12	0.17	0.11	0.46	0.8	0.20
Sulphate	24	64	35	26	77	40
Lead	0.005	0.005	0.005	0.005	0.005	0.005
Mercury	0.00001	0.00001	0.005	0.00001	0.00001	0.00001
All units in mg/l						

4.4.1.5 Monitoring and maintenance of the surface water management system and related infrastructure will be required to ensure the ongoing movement of water through the Site and efficient operation of the runoff attenuation areas. This notwithstanding, the level of maintenance is considered no greater than usual landowner requirements for good ditch/culvert maintenance. In this regard, an annual program of maintenance is specified within the surface water drainage scheme.

4.4.2 Post Closure Management

4.4.2.1 The Site will be restored as set out within the planning permission as submitted (*appendix 1*). This will include a restoration and aftercare period. Beyond the aftercare period, the EP will be surrendered in accordance with the prevailing legislation (see current requirements below).

4.4.3 Likelihood of Subsidence /Differential Settlement

4.4.3.1 Waste types to be imported at the Site will be inert, primarily derived from construction waste. Imported material will be placed within the relatively shallow restoration landform and compacted using best practice techniques. The saturated thickness within the surrounding aquifer is generally low, hence groundwater pressures on the placed liner material would be expected to be similarly low. On this basis, the Site is not expected to be subject to any significant settlement/instability and a stability risk assessment has therefore not been provided at this stage.

4.4.4 Conditions Where Permit Surrender is Acceptable

4.4.4.1 The protocol for surrender of an EP for a Recovery Operation is set out on the DEFRA website – Section 8[4]. Any application for surrender of the EP will need to satisfy that necessary measures have been taken to: *(a) avoid the risk of pollution from the activity and (b) return the site to a satisfactory state*.

4.4.4.2 Groundwater and surface water data will be collected throughout the life of the Recovery Operation. Monitoring requirements will be reviewed annually, as set out in the submitted Hydrogeological Risk Assessment. Hills will ensure that sufficient data is collected to demonstrate that there are no unacceptable releases from the Site that have the potential to cause damage to, or deterioration of, the environment and risk to human health.

4 https://www.gov.uk/government/publications/landfill-epr-502-and-other-permanent-deposits-of-waste-how-to-surrender-your-environmental-permit/landfill-and-deposit-for-recovery-aftercare-and-permit-surrender#apply-to-surrender-your-permit

5 MONITORING

5.1 Weather

5.1.1 Data Sources and Availability

5.1.1.1 Local rainfall data has been obtained from the EA for the Kempsford Rain Gauge. This represents the closest active gauge to the Site, being located at NGR: 41480 19720 some 2.5km east of the Site, at an elevation of circa 75maOD. The relative close proximity and similar elevation of the station, indicate that the data can be considered representative of rainfall expected at the Site.

5.1.2 Precipitation

5.1.2.1 For comparison with the Kempsford Rain Gauge data, the Standard Average Annual Rainfall (SAAR) for the area encompassing the Site, for the period 1961 to 1990 (SAAR6190) as obtained from the CEH FEH online rainfall model, is 687mm.

5.1.2.2 The Kempsford Rain Gauge has been in operation since 1961. The long-term average monthly data for period 1961 – 2018 are presented at *table 12*. The full monthly total data are presented in tabular form at *appendix 3*.

Table 12 Area Long Term Average Monthly Rainfall and Potential Transpiration

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Area Average Rainfall	64.2	47.9	51.4	48.1	55.1	51.1	47.3	59.3	54.5	62.8	67.8	73.9	683.2
Potential Evaporation	1	10	30	55	80	91	92	75	44	20	5	0	503

5.1.2.3 Potential transpiration data for the locality has been obtained from MAFF Technical Bulletin 34 (Area 26)[5] and these are also given below at *table 12,* alongside the potential long-term average monthly rainfall data for the Site.

5.1.2.4 The available rainfall data has been utilised to derive estimates for monthly effective rainfall for vegetated surfaces, bare ground and open water, using the methods of Grindley[6] and EA R&D Handbook W6-043/HBRef.13[7] as presented below at *table 13*.

5.1.2.5 The effective rainfall figures presented at *table 13* for "permanent grassland" are considered reflective of the prevailing situation for the majority of the Site and for the restored landform (some 196mm annual rainfall available for recharge). This compares to the "bare earth" scenario, which is expected to be more representative of periods of mineral extraction at the Site (some 259mm annual rainfall available for recharge).

5 "Climate & Drainage", Technical Bulletin No.34, Ministry of Agriculture Fisheries & Food (MAFF), September 1976.

6 "The Calculation of Actual Evaporation and Soil Moisture Deficit over Specified Catchment Areas", Grindley J, November 1969, Hydrological Memorandum 38, Meteorological Office, Bracknell, UK.

7 "Estimation of Open Water Evaporation, Guidance for Environment Agency Practitioners", R&D Handbook W6-043/HB, Finch JW and Hall RL, October 2001.

Table 13 Derivation of Effective Rainfall for various land use types													
Bare Earth (rc = 0mm)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rf	64	48	51	48	55	51	47	59	55	63	68	74	683
Pe	1	10	30	55	80	91	92	75	44	20	5	0	503
rf-Pe	63	38	21	-7	-25	-40	-45	-16	11	43	63	74	180
dPsmd	0	0	0	7	25	40	45	16	-11	-43	-63	-16	
dAsmd	0	0	0	7	20	13	3	1	-1	-43	0	0	
Asmd	0	0	0	7	32	72	116	132	122	79	16	0	575
Psmd	0	0	0	7	27	40	43	44	43	0	0	0	204
Ae	1	10	30	55	75	64	50	60	54	20	5	0	424
ERF	63	38	21	0	0	0	0	0	0	0	63	74	259
Permanent Grassland (rc = 75mm)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rf	64	48	51	48	55	51	47	59	55	63	68	74	683
Pe	1	10	30	55	80	91	92	75	44	20	5	0	503
rf-Pe	63	38	21	-7	-25	-40	-45	-16	11	43	63	74	180
dPsmd	0	0	0	7	25	40	45	16	-11	-43	-63	-16	
dAsmd	0	0	0	7	25	40	35	4	-3	-29	-79	0	
Asmd	0	0	0	7	32	72	116	132	122	79	16	0	575
Psmd	0	0	0	7	32	72	107	111	108	79	0	0	516
Ae	1	10	30	55	80	91	82	63	52	34	5	0	503
ERF	63	38	21	0	0	0	0	0	0	0	0	74	196
Open Water													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Correction Constants	1.4	1.1	0.9	1.0	0.9	1.0	1.2	1.4	1.5	2.0	2.3	2.0	
Ae	1.4	11.4	27.6	52.3	72.8	92.8	114.1	102.8	64.7	39.8	11.5	0.0	591.1
ERF	62.8	36.5	23.8	-4.2	-17.7	-41.7	-66.8	-43.5	-10.2	23.0	56.4	73.9	92.3
rc: Root Constant, Rf: Rainfall, Pe: Potential Evaporation, Psmd: Potential Soil Moisture Deficit. Asmd: Actual Soil Moisture Deficit, Ae: Actual Evaporation, ERF: Effective Rainfall. All units other than correction constants are millimetres.													

5.2 Gas Monitoring & Infrastructure

5.2.1.1 In-waste gas wells will not be installed and a programme of monitoring is not deemed necessary since the Waste Acceptance Procedures in place will prevent the acceptance of non-inert/degradable waste at the Site. Inert waste has a negligible risk of creating landfill gas. Should any biodegradable material be contained in the loads when they have been tipped on site, the on-site checks will pick that up and it can be removed. The waste acceptance procedures and site procedures are adopted to ensure that the waste used for restoration is inert.

6 SUMMARY AND CONCLUSIONS

6.1 An Environmental Setting and Site Design (ESSD) has been undertaken with respect of the proposed deposition of inert materials at Airfield Quarry, Gally Leaze, Gloucestershire, under waste recovery permit, to restore mineral workings to a combination of agricultural, amenity and nature conservation afteruses.

6.2 Available data regarding the history and current environmental setting has been presented to provide an understanding of the Recovery Operation in the context of the prevailing hydrological and hydrogeological setting.

6.3 The report concludes that, subject to the adoption of mitigation measures and controls proposed to be undertaken at the Site, the Recovery Operation is appropriate in the context of the surrounding environment.

Paul Burfitt, BSc(HONS), MSc, FGS.
Principal Hydrogeologist

BCL Consultant Hydrogeologists Limited
October 2022

B/LMM/AQ_ESSD/22

Hills Quarry Products Limited

Airfield Quarry

Gally Leaze, Gloucestershire

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Figures

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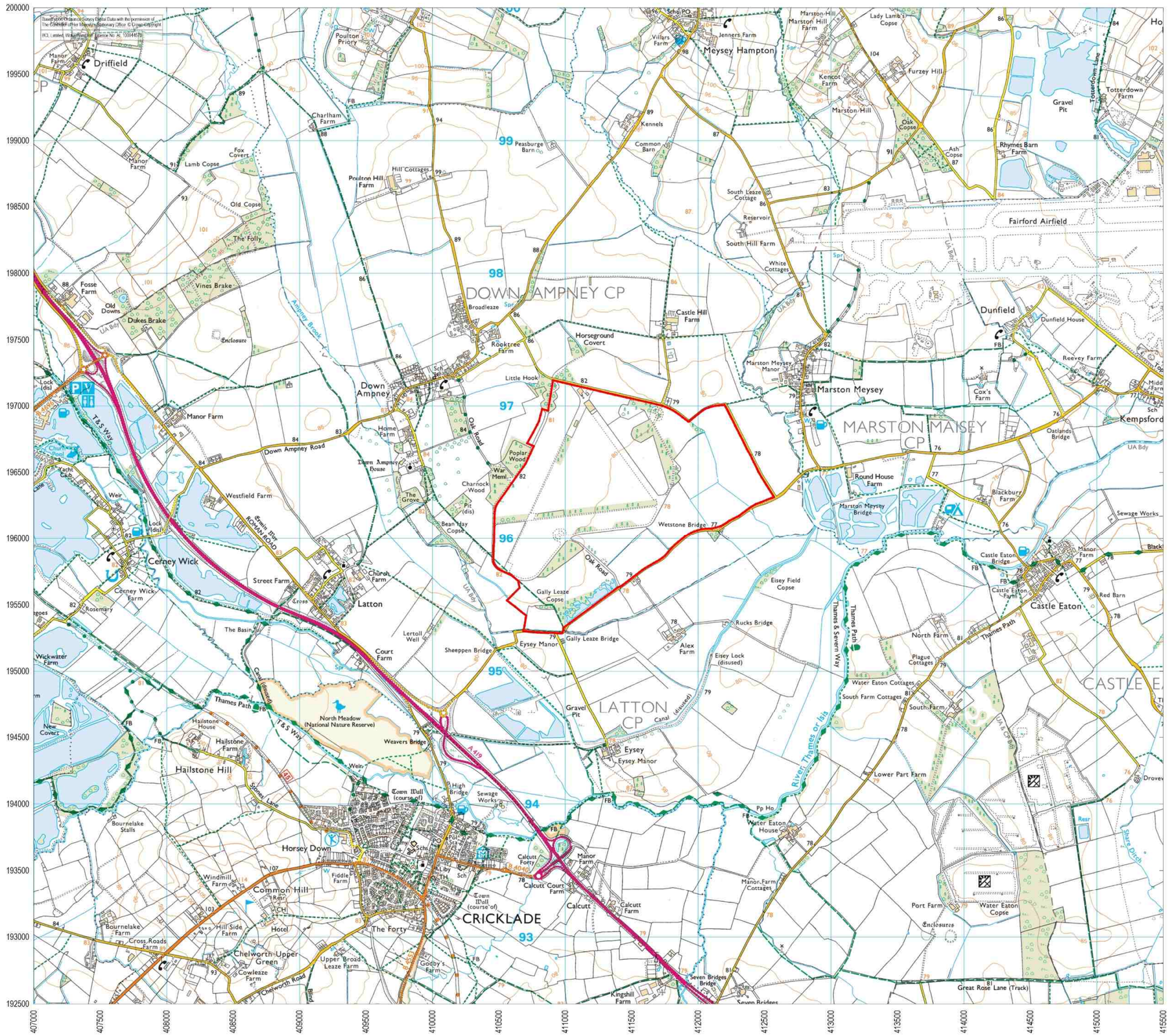
email: info@bclhydro.co.uk, web: http://www.bclhydro.co.uk
Registered Office: 33, Wolverhampton Road, Cannock, West Midlands, WV11 1AP
Registered in England & Wales. Company Registration Number: 4043373



Key

Airfield Quarry site boundary

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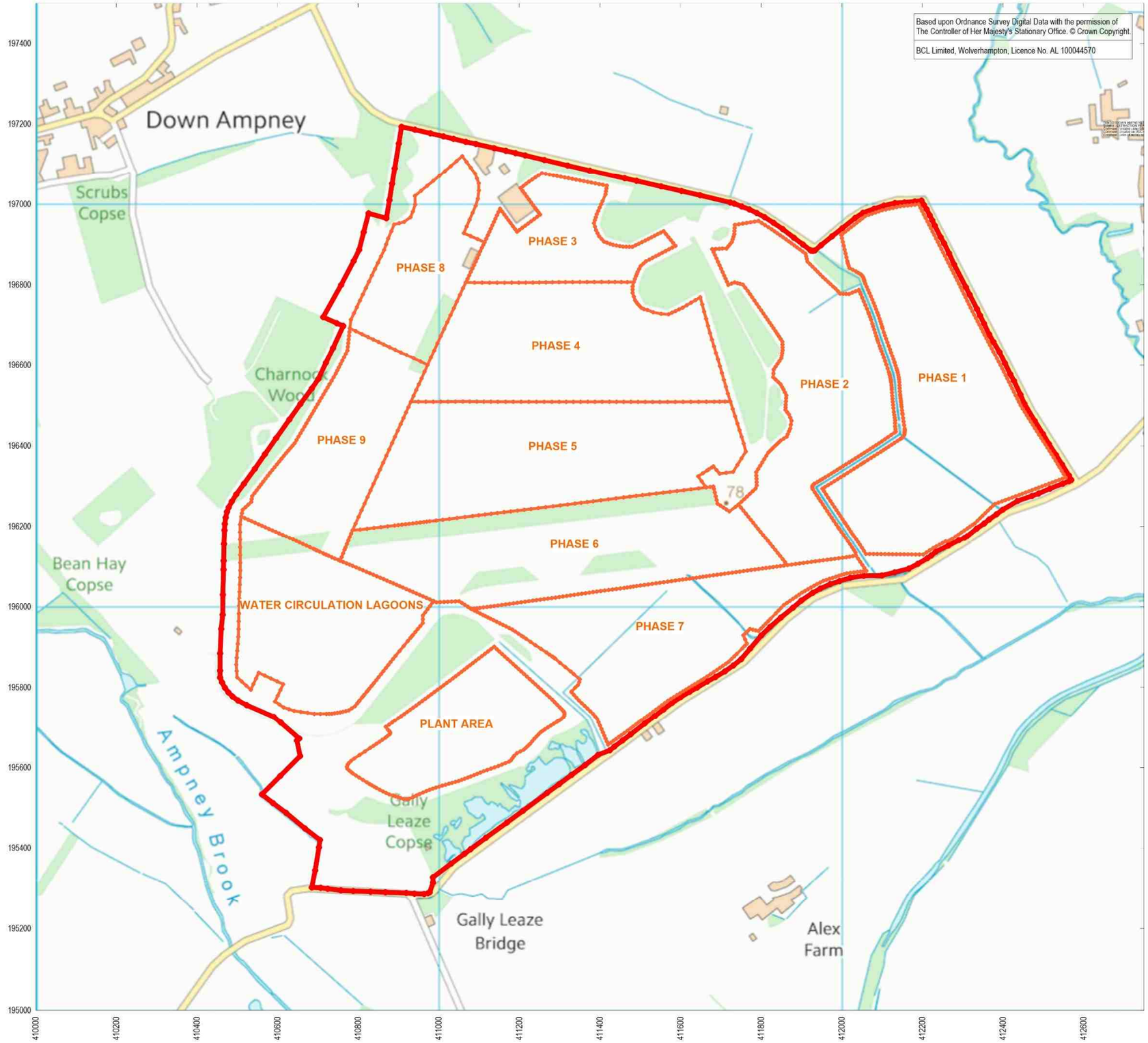
Figure 1: Site location

Drawn By: PB	**Scale: 1:30,000**
Date: Sep 22	**Format: A3L**



Key

Airfield Quarry site boundary

Extraction area and phase boundary

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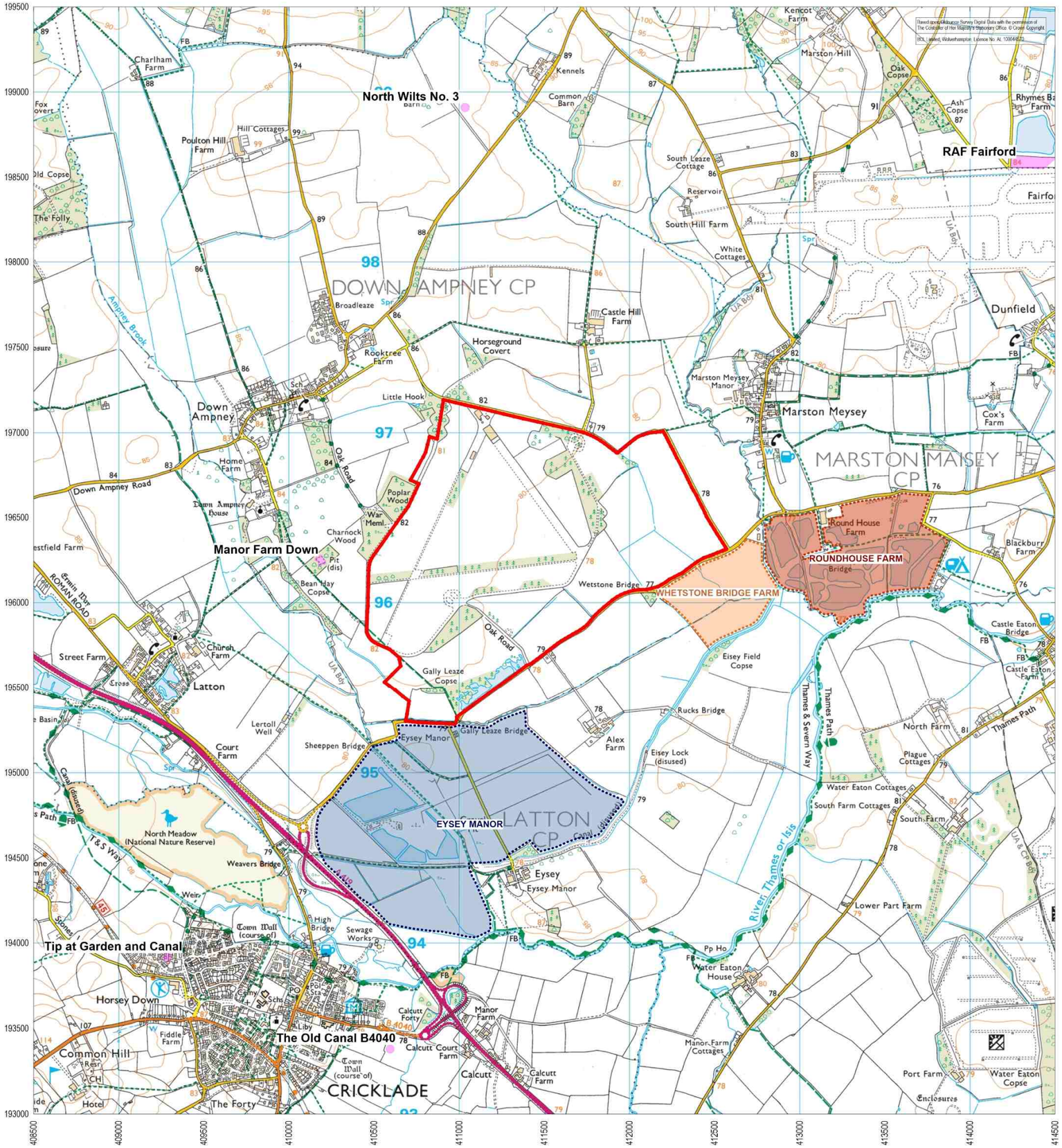
Figure 2: Infill areas and phasing

Drawn By: PB	**Scale: 1:10,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- EA registered landfill and ID (table 12)

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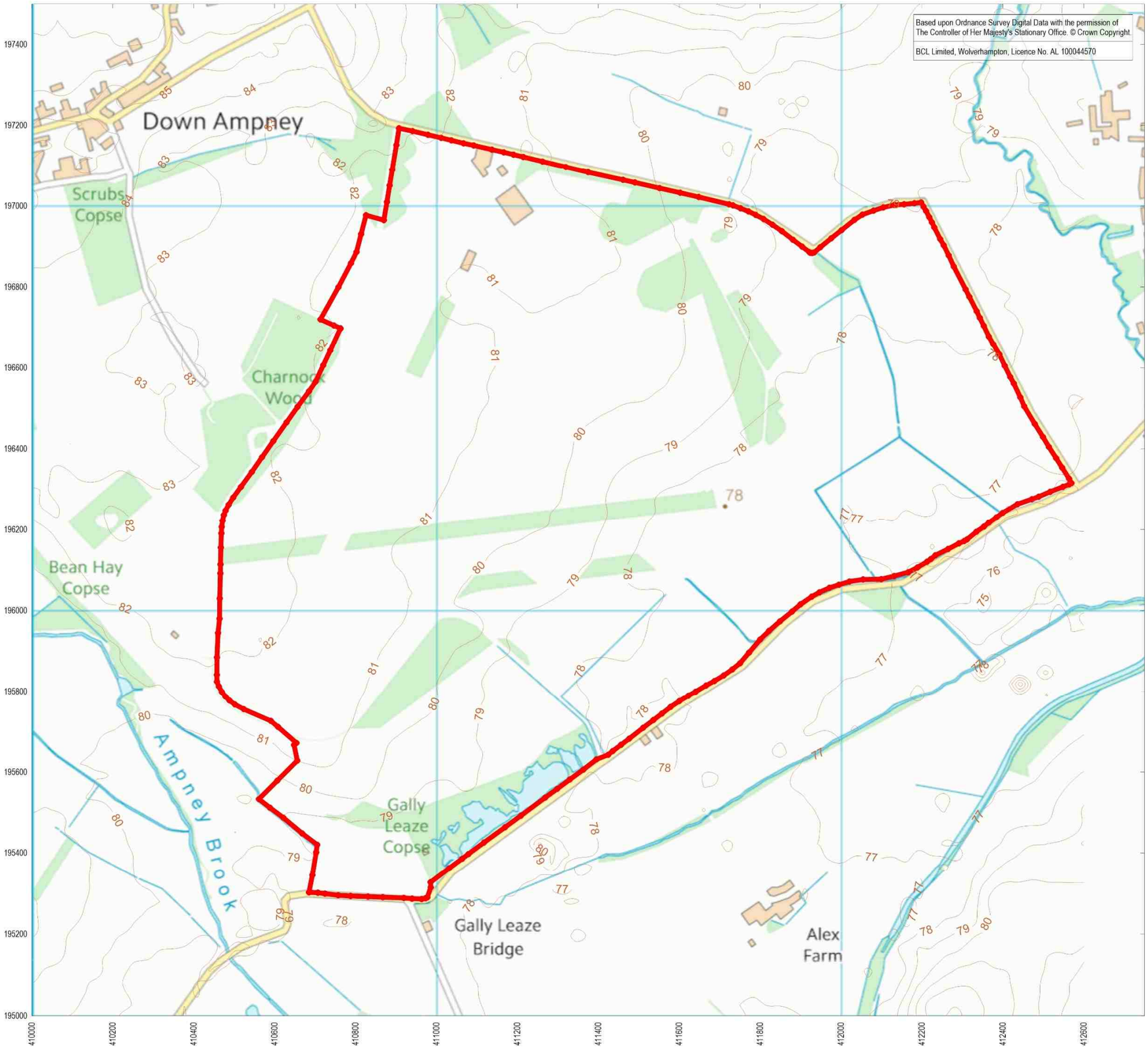
Figure 3: Existing operations in the locality

Drawn By: PB	**Scale: 1:30,000**
Date: Sep 22	**Format: A3L**



Key

Airfield Quarry site boundary

Elevation contour (maOD)

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Figure 4: Site survey (maOD)

Drawn By: PB	**Scale: 1:10,000**
Date: Sep 22	**Format: A3L**

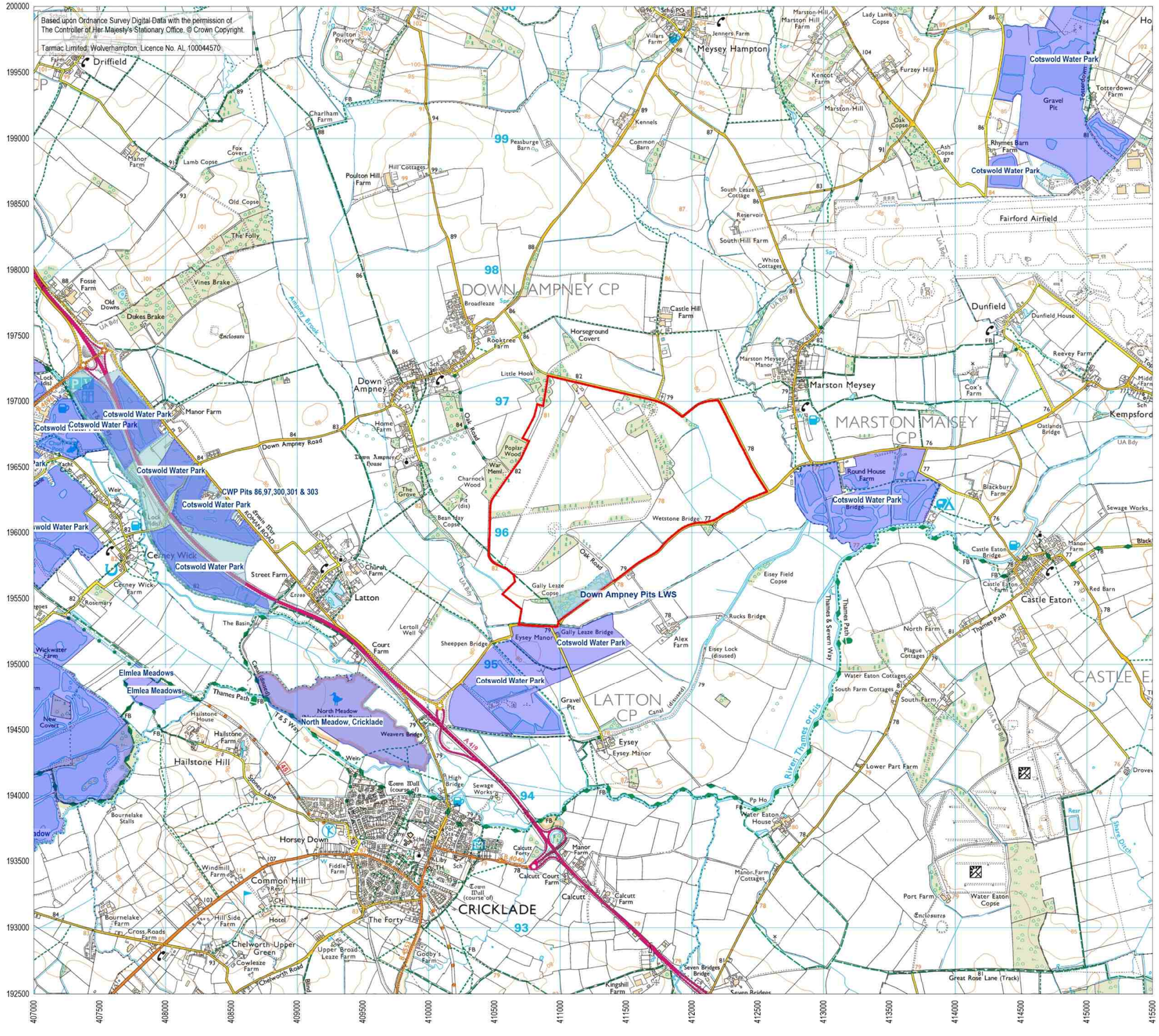

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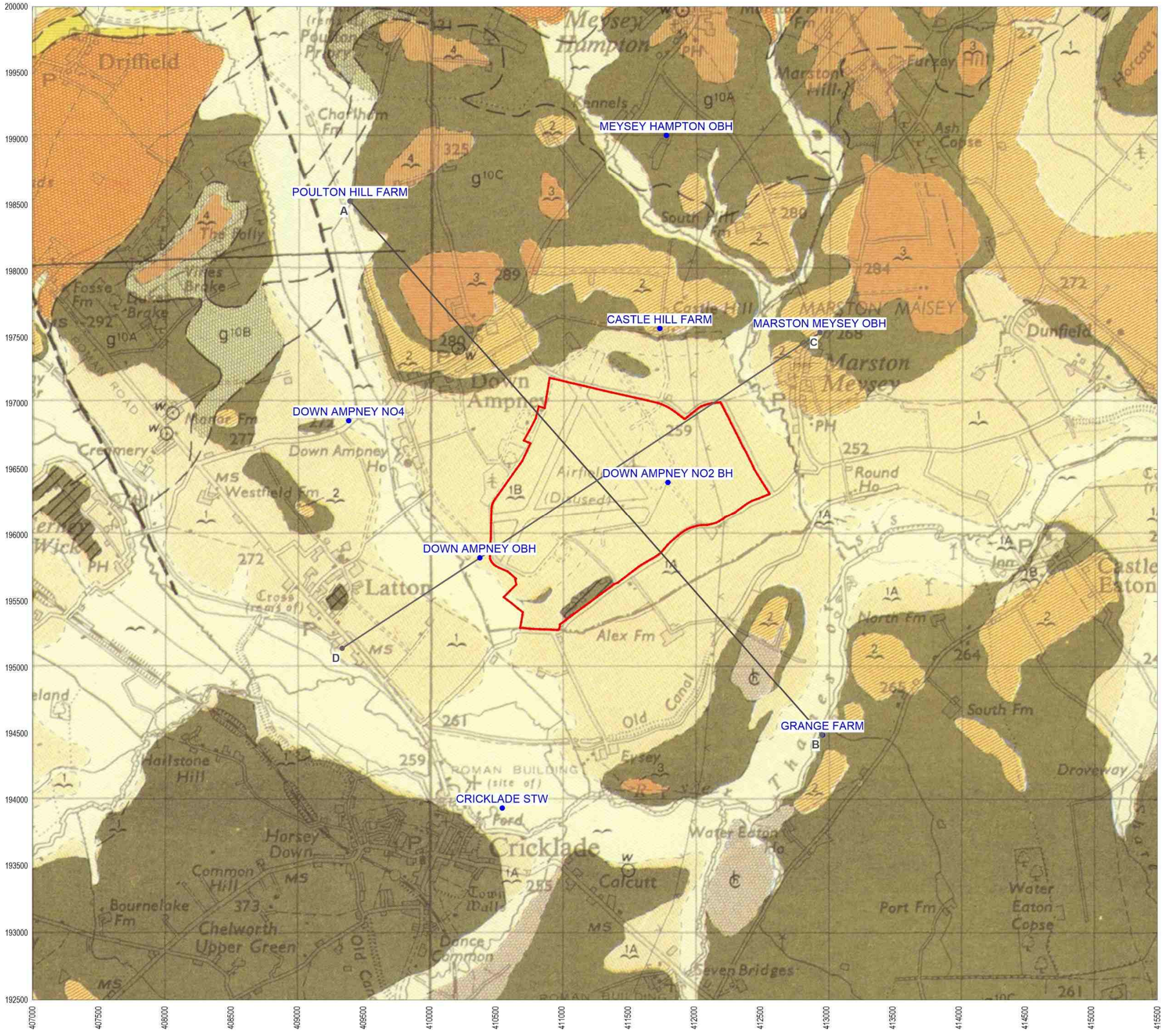
Figure 5: Statutorily and Non-statutorily protected sites

Drawn By: PB	**Scale: 1:30,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- Borehole (BGS Well Records)
- Line of cross-section (*figure 7*)

Key to geological units
(Extract from BGS sheet 252)

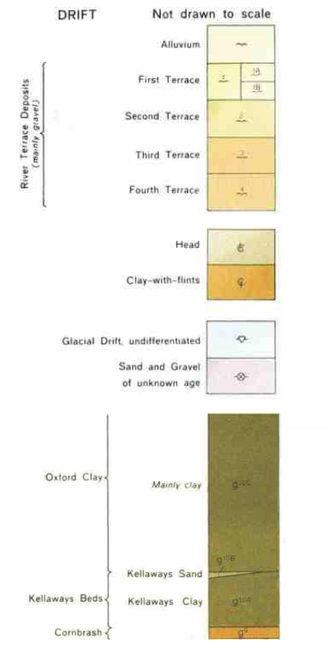


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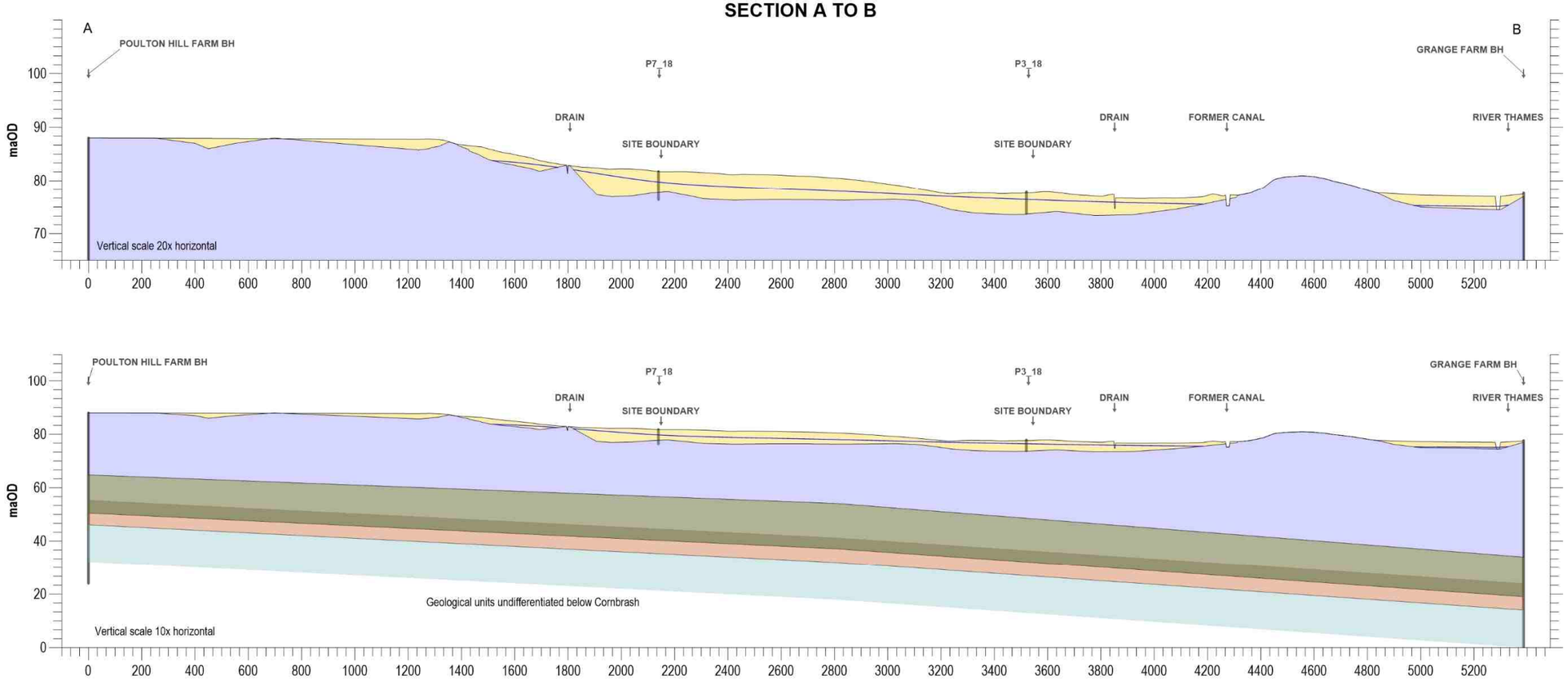
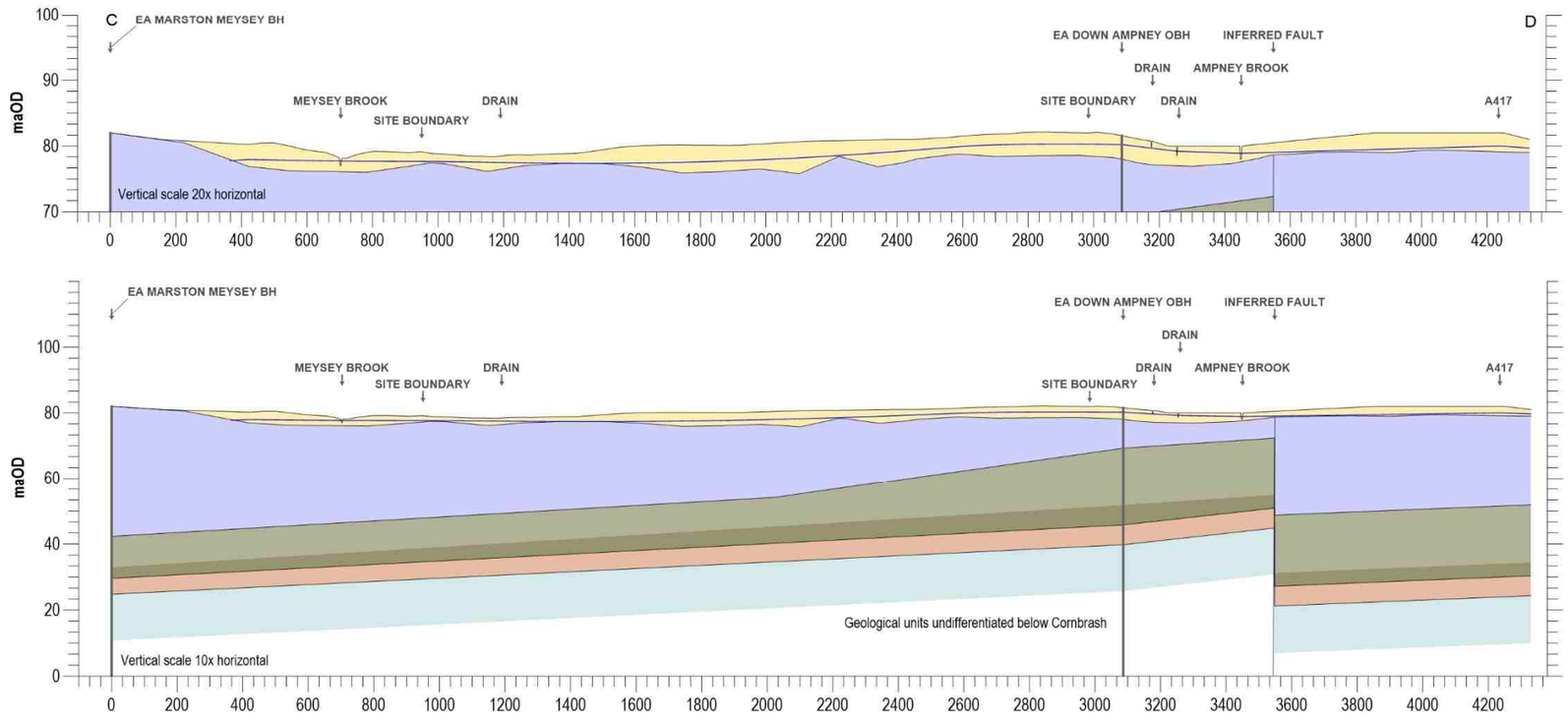
Figure 6: Regional geology – extract from BGS sheet 252

Drawn By: PB	**Scale: 1:30,000**
Date: Sep 22	**Format: A3L**

SECTION A TO B



SECTION C TO D



Key

- Sand and gravel
- Oxford Clay
- Kellaways Sand
- Kellaways Clay
- Cornbrash
- Forest Wood Marble and other units (undifferentiated)
- Watertable recorded with sand and gravel
- Site piezometer
- Geological fault (inferred)

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Airfield Quarry, Gally Leaze, Gloucestershire

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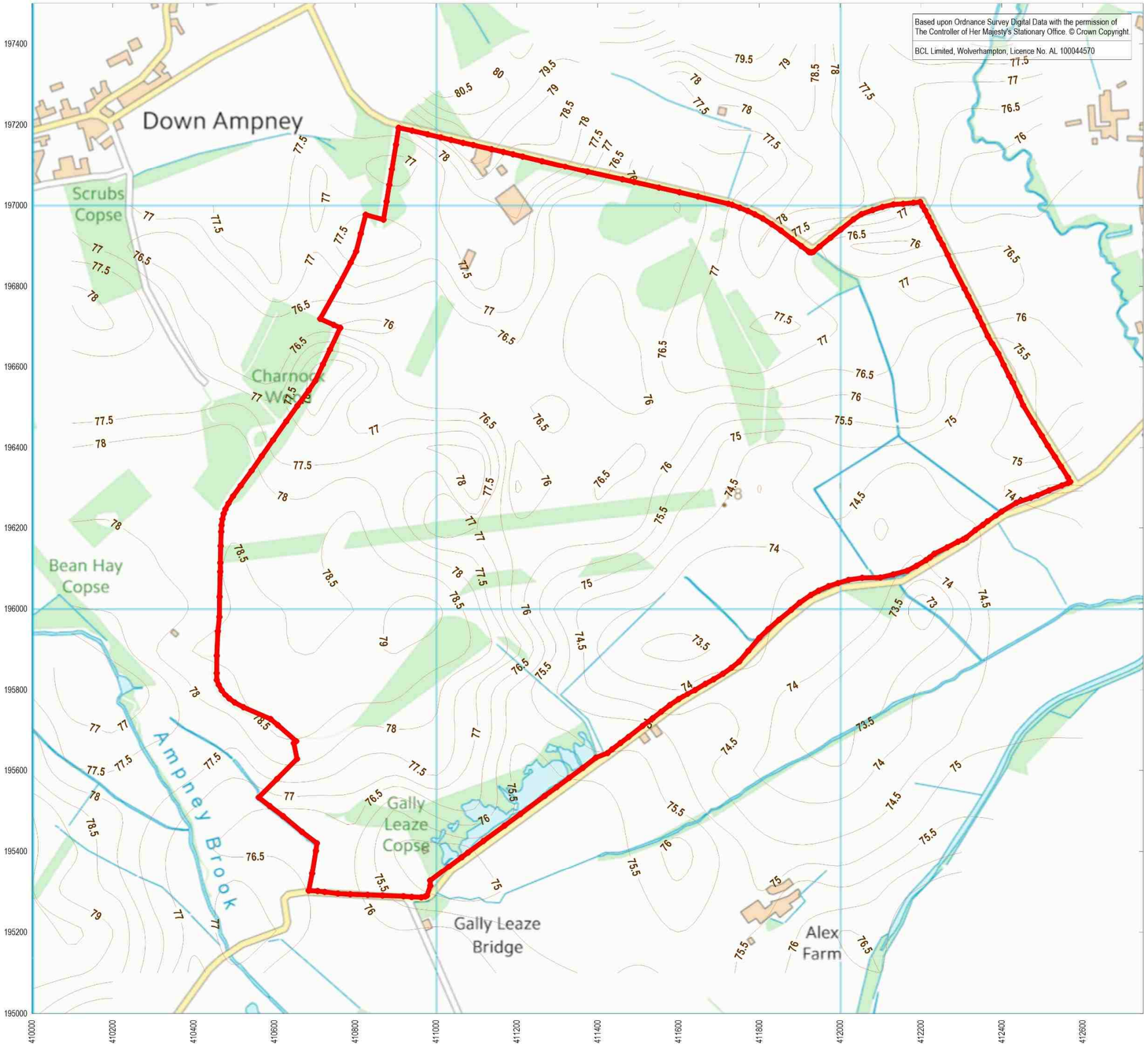
Figure 7: Geological cross-sections (figure 6)

Drawn By: PB	**Scale: as shown**
Date: Sep 22	**Format: A3L**



Key

Airfield Quarry site boundary

Base of deposit contour (maOD)

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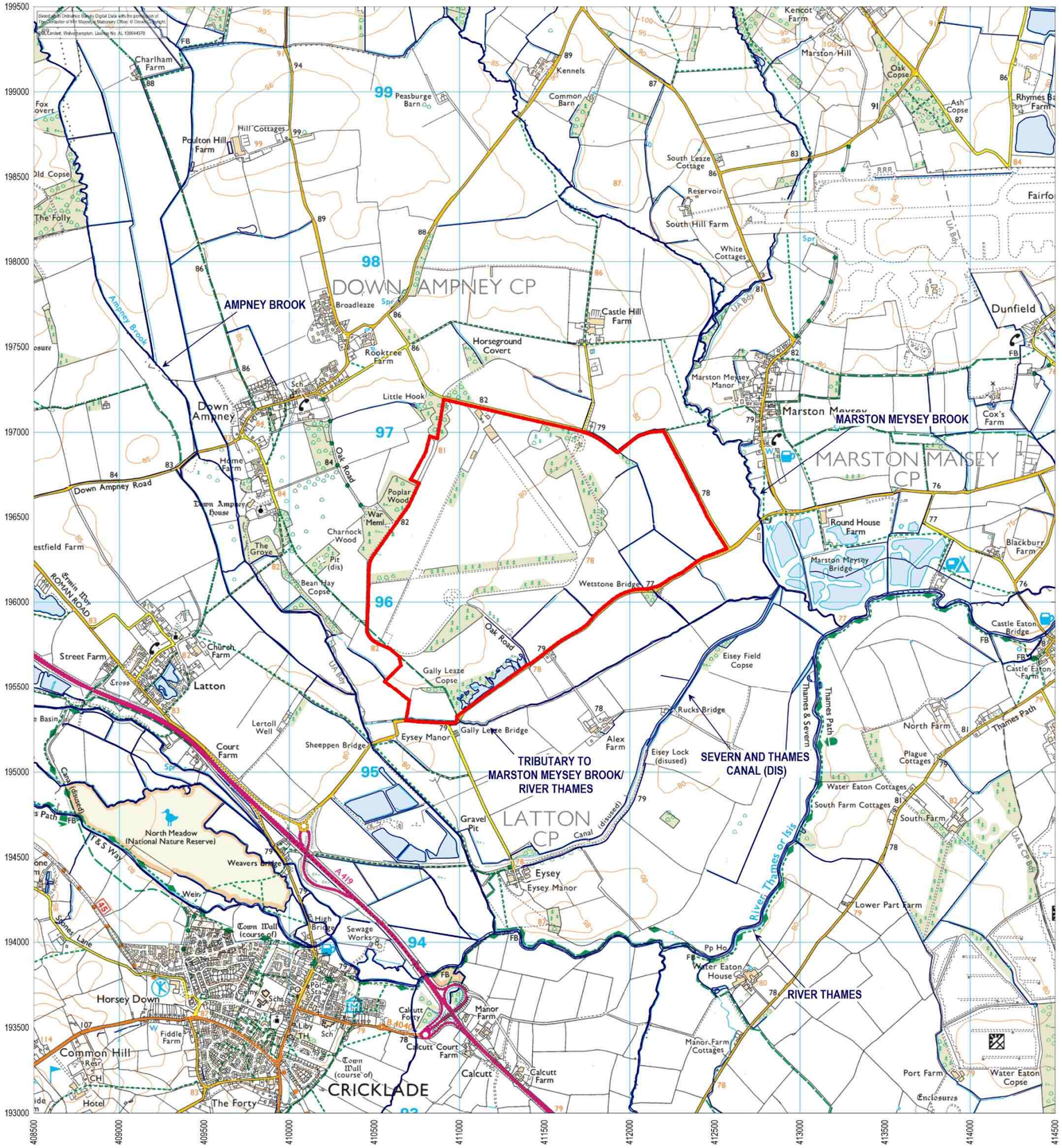
Figure 8: Base of sand and gravel (maOD)

Drawn By: PB	**Scale: 1:10,000**
Date: Sep 22	**Format: A3L**



Key

Airfield Quarry site boundary

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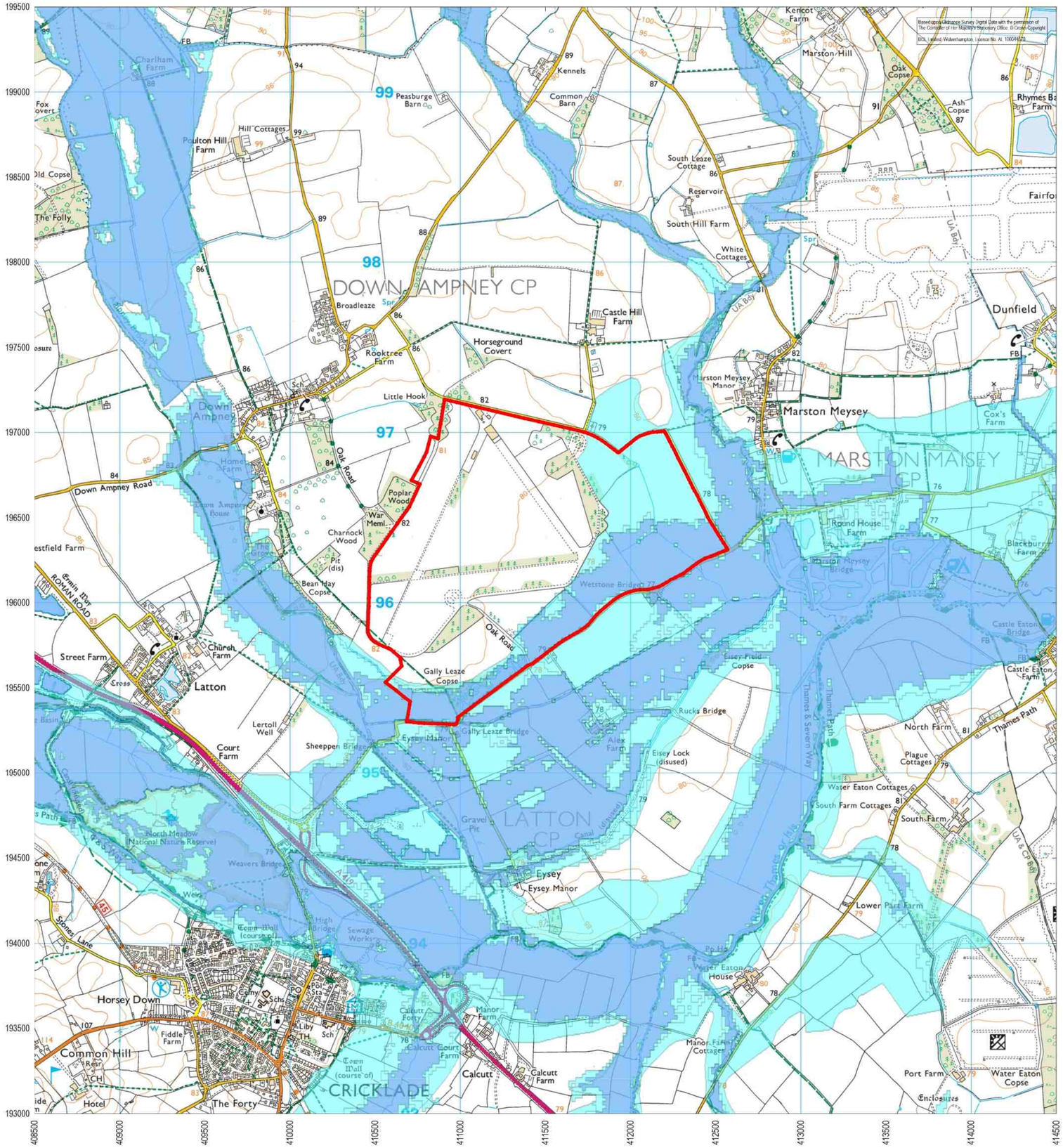
Figure 9: Watercourses

Drawn By: PB	**Scale: 1:25,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- Flood Risk Zone 2 (0.1% AEP)
- Flood Risk Zone 3 (1% AEP)

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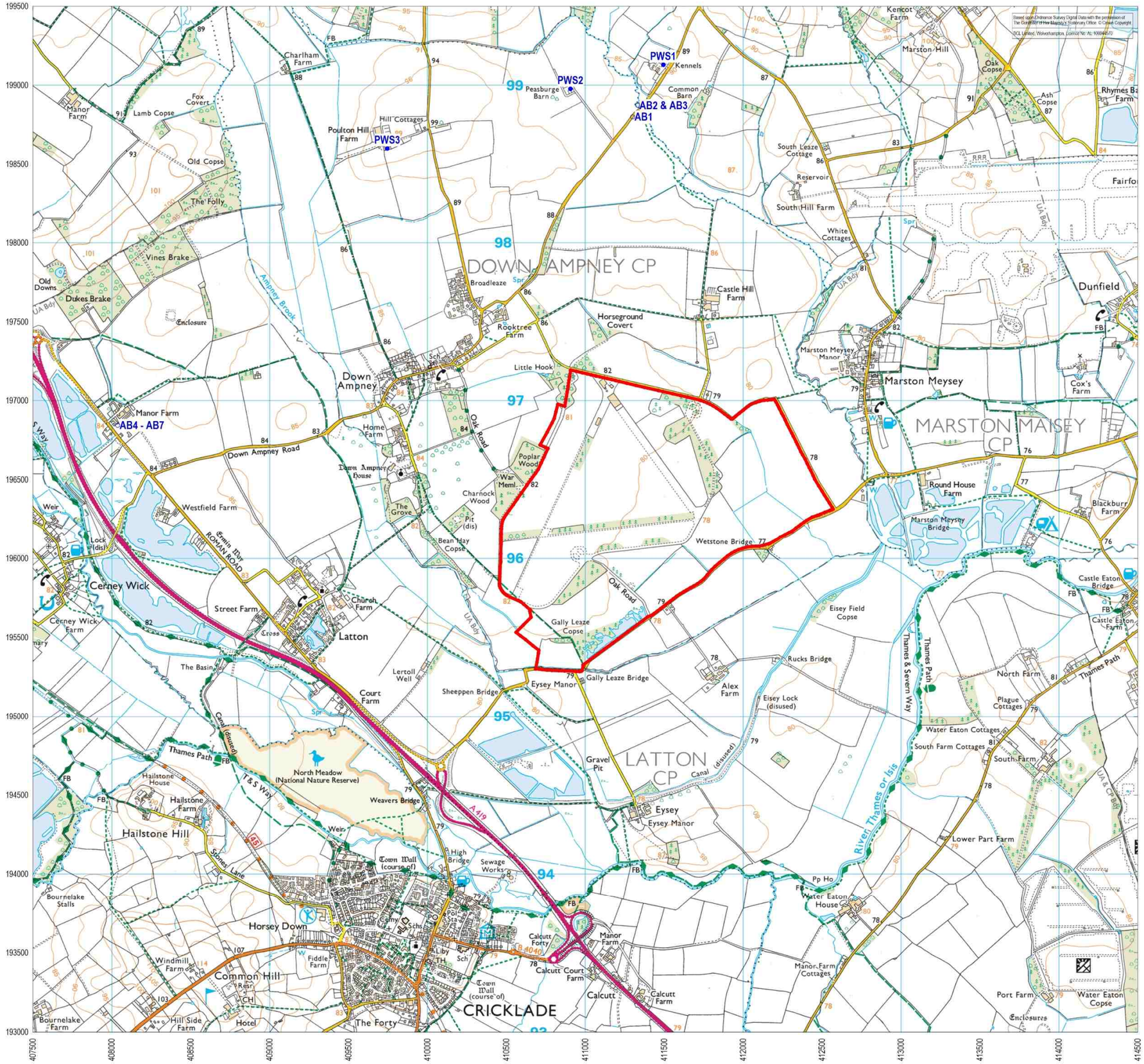
Figure 10: Extract of Environment Agency Flood Map data

Drawn By: PB	**Scale: 1:25,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- EA Licenced abstraction and ID (table 8)
- Private water supply abstraction and ID (table 9)

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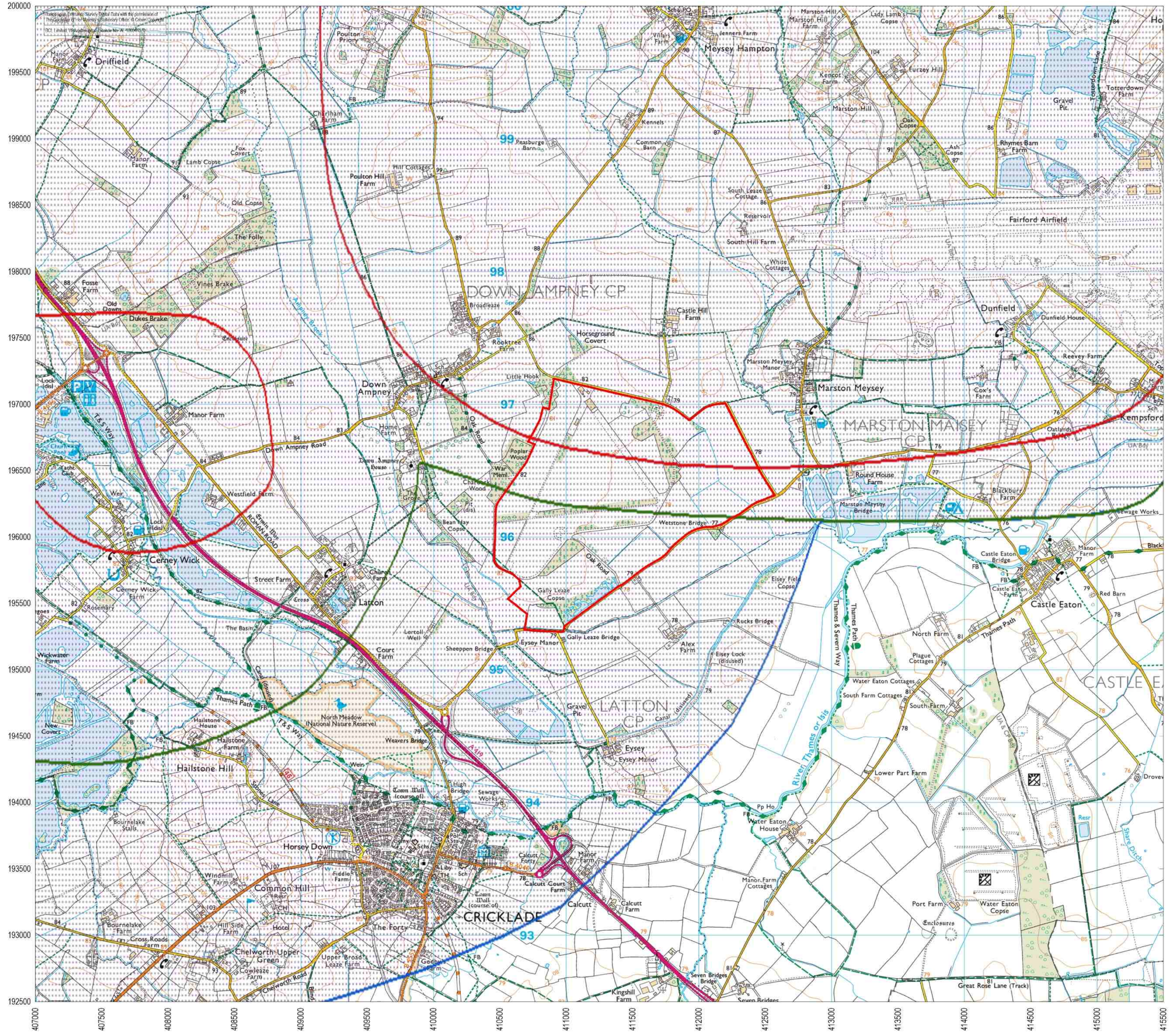
Figure 11: Licensed abstractions and Private Water Supplies

Drawn By: PB	**Scale: 1:25,000**
Date: Sep 22	**Format: A3L**



Key

	Airfield Quarry site boundary
	EA Source Protection Zone 1 (SPZ1)
	EA Source Protection Zone 2 (SPZ2)
	EA Source Protection Zone - Catchment

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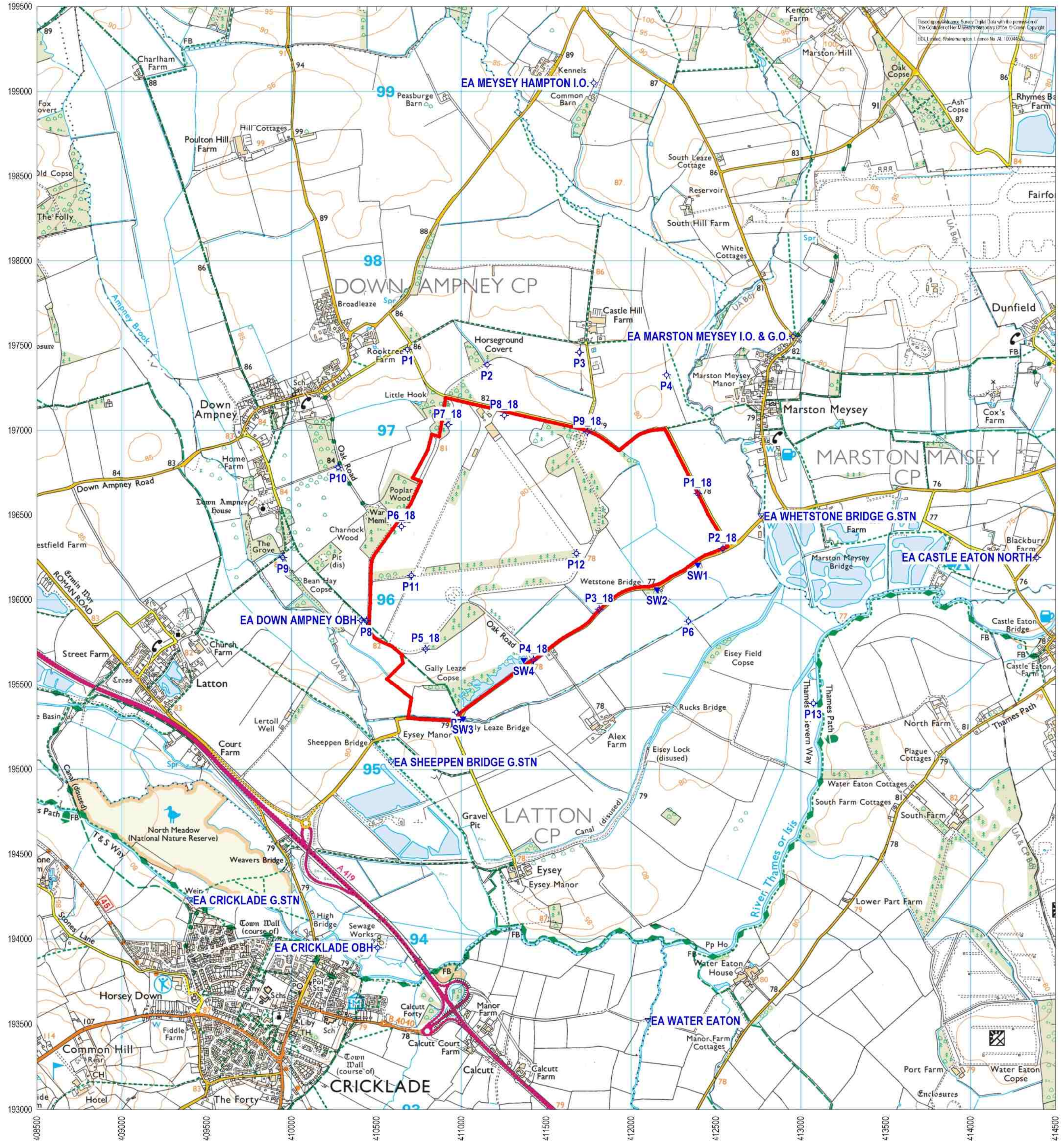
Figure 12: Environment Agency Source Protection Zones

Drawn By: PB	**Scale: 1:30,000**
Date: Sep 22	**Format: A3L**



Key

Airfield Quarry site boundary

Groundwater monitoring point and ID

Surface water monitoring point and ID

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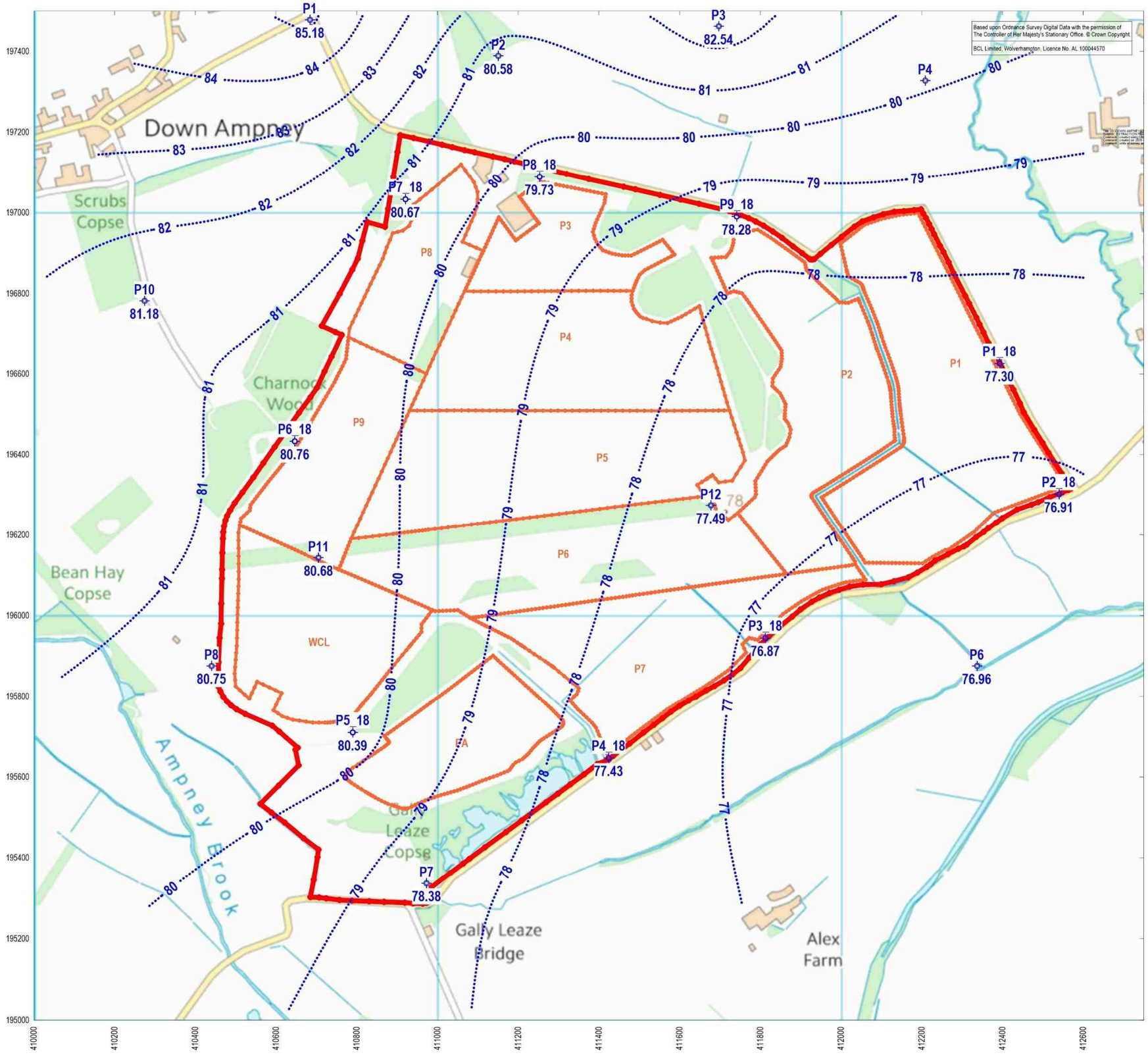
Figure 13: Monitoring point location plan

Drawn By: PB	Scale: 1:25,000
Date: Sep 22	Format: A3L



Key

- Airfield Quarry site boundary
- Groundwater monitoring point and measured elevation – sand and gravel aquifer (maOD)
- Piezometric contour – sand and gravel aquifer (maOD)

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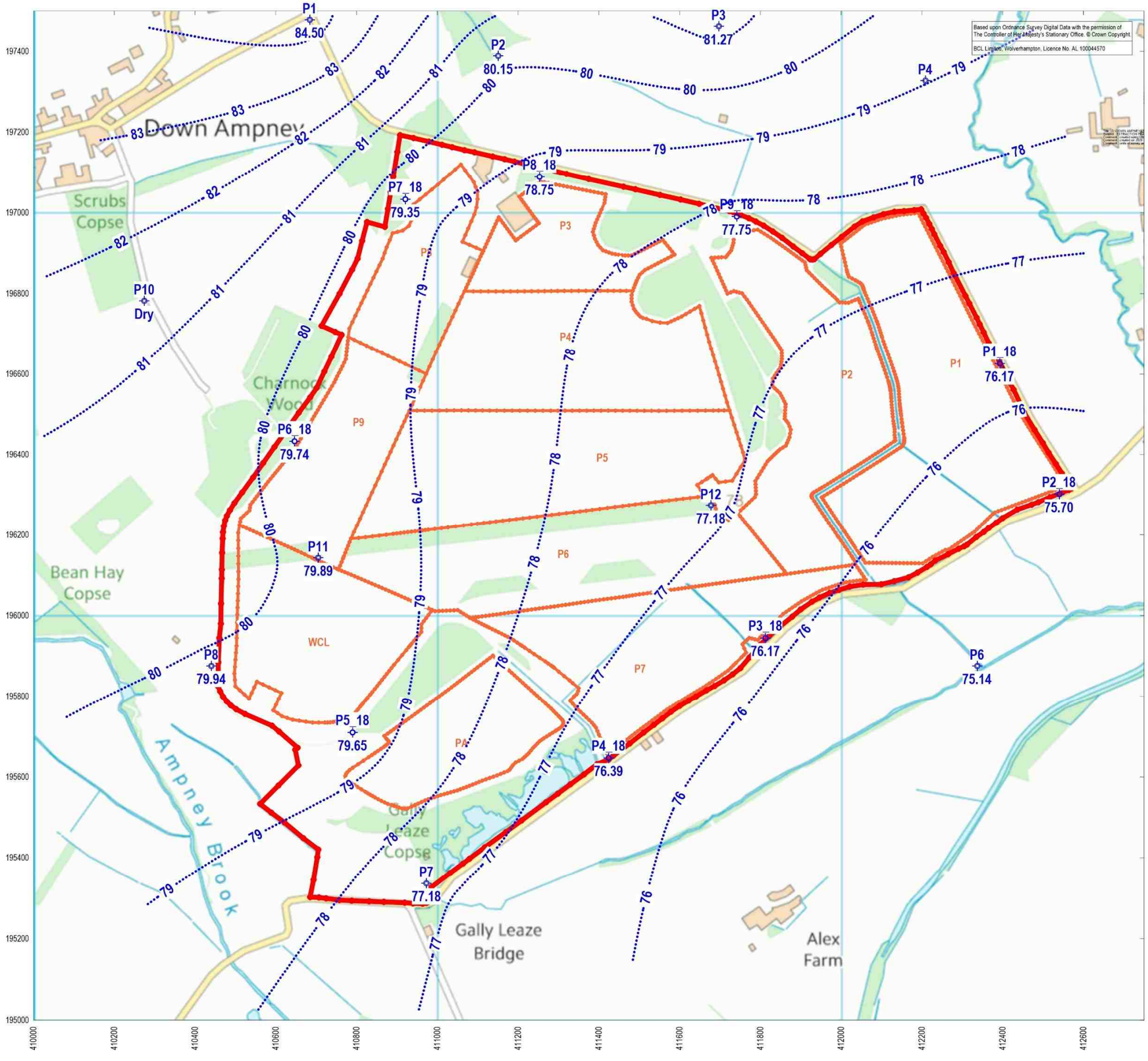
Figure 14: Piezometric contour plot – Representative maximum elevation conditions (maOD): 31st October 2019

Drawn By: PB	**Scale: 1:10,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- Groundwater monitoring point and measured elevation – sand and gravel aquifer (maOD)
- Piezometric contour – sand and gravel aquifer (maOD)

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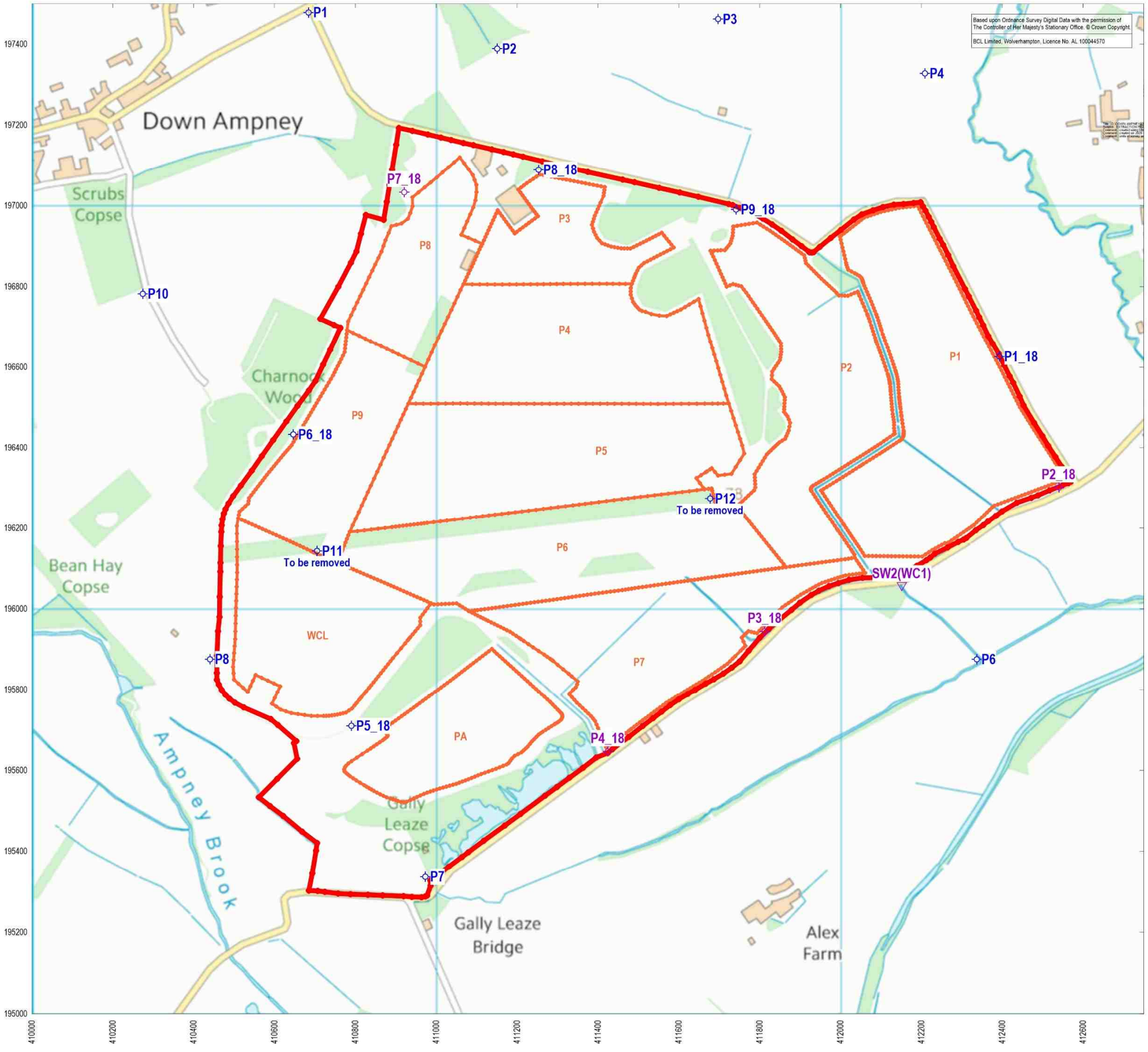
Figure 15: Piezometric contour plot – Representative minimum elevation conditions (maOD): 28th August 2020

Drawn By: PB	**Scale: 1:25,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- Groundwater monitoring point and ID (blue denotes general location, purple – control/compliance location)
- Surface water sampling point and ID

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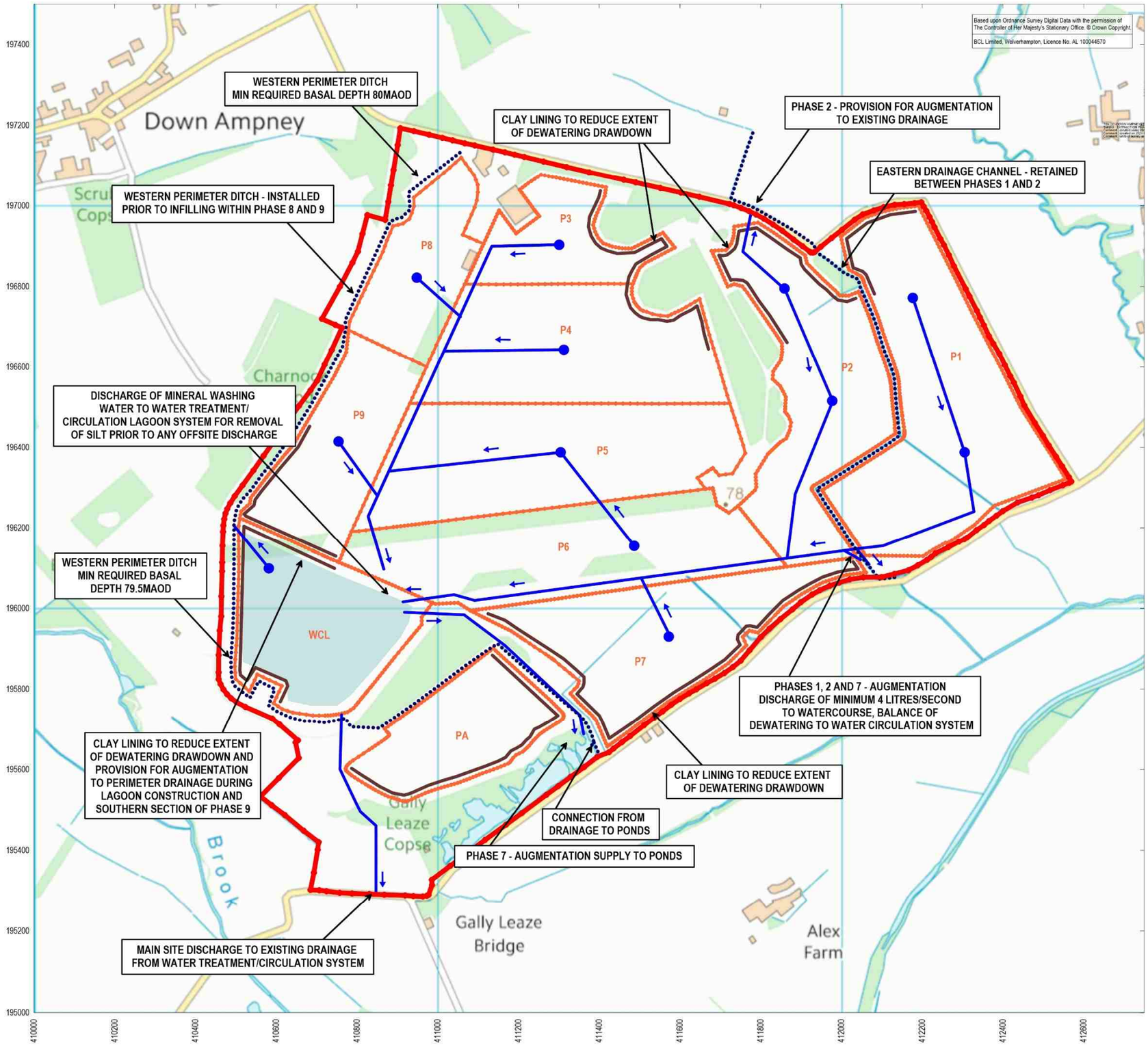
Figure 16: Compliance points

Drawn By: PB	**Scale: 1:25,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- Sump and pumped movement of water
- Drainage channel
- Clay filled trench (buffer)

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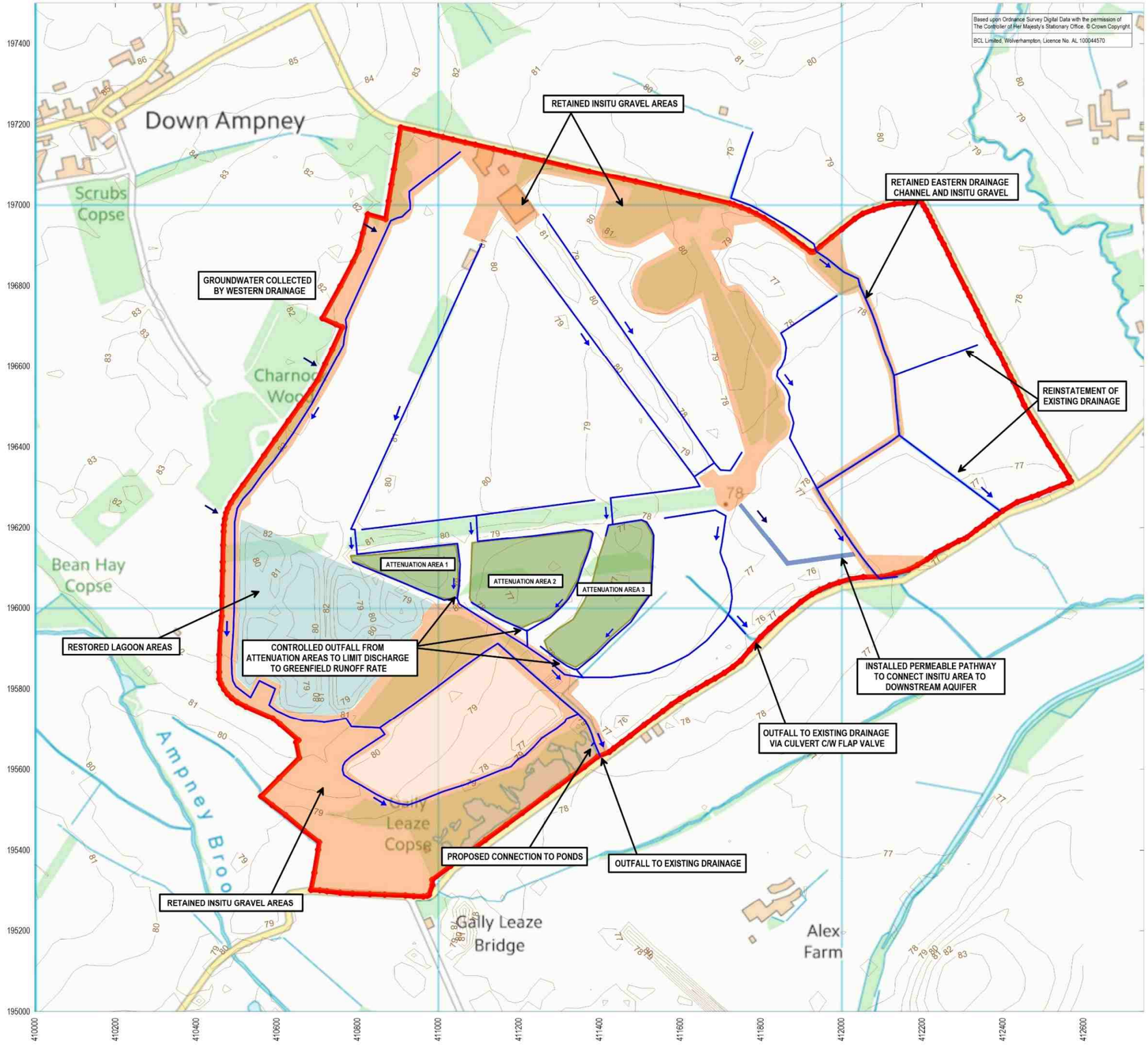
Figure 17: Working Phase – Water Management Schematic

Drawn By: PB	**Scale: 1:10,000**
Date: Sep 22	**Format: A3L**



Key

- Airfield Quarry site boundary
- Retained insitu sand and gravel areas
- General groundwater flow direction
- Installed permeable pathways
- Drainage channels
- Temporary runoff attenuation areas

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Figure 18: Restoration landform – Schematic drainage features and temporary runoff attenuation areas

Drawn By: PB	**Scale: 1:10,000**
Date: Sep 22	**Format: A3L**

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Airfield Quarry

Gally Leaze, Gloucestershire

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Appendix 1 Appendix 6 Restoration figure (ESP Drawing no. D10_LAN_215)

BCL HYDRO
BCL Consultant Hydrogeologists Limited

Technology Centre, Wolverhampton Science Park, Glashier Drive, Wolverhampton
West Midlands, WV10 9RU. Tel: 01902 824111, Fax: 01902 824112
email: info@bclhydro.co.uk, web: http://www.bclhydro.co.uk
Registered Office: 33, Wolverhampton Road, Cannock, West Midlands, WV11 1AP
Registered in England & Wales. Company Registration Number: 4043373

Main western drainage ditch

New permissive path links to airfield memorial

Wet woodland forming full canopy

Main eastern drainage ditch

Avenue of trees define former airfield runways

Low causeways constructed to attenuate winter flood flows

Ends of all 3 airfield runways retained

Lowland meadows managed for floristic diversity

Vehicle entrance retained

LEGEND

- Contours
- Existing tree, shrub, hedge and woodland
- Restored tree, shrub, hedge and woodland
- Restored wet woodland
- Restored reed marsh progressing to wet woodland
- Restored agricultural land
- Restored lowland meadow
- Restored permanent pasture
- Restored marginal grassland
- Existing pond, river, drain and wetland
- Public Right of Way
- Permissive Path
- Retained access track
- Retained sections of runway and perimeter airfield road
- Open ditches, ditches within woodland and culverts
- Potential outfall into existing drainage system to south

INFORMATION

CLIENT

Hills

ESP

Chartered Surveyors
Chartered Landscape Architects
Environmental Consultants
Health and Safety Consultants

The Creative Industries Centre
Glaisher Drive
Wolverhampton
WV10 9TG

Tel: 01902 771881

PROJECT

Airfield Quarry

TITLE

Restoration Proposals

SCALE	DRAWN BY	DATE
1:5,000 @A1 1:10,000 @A3	KH/KB	Oct 2020

DRAWING NUMBER	REV
D10_LAN_215	v1.0

B/LMM/AQ_ESSD/22

Hills Quarry Products Limited

Airfield Quarry

Gally Leaze, Gloucestershire

Application for Waste Recovery Permit

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Appendix 2 Water features survey details

BCL HYDRO
BCL Consultant Hydrogeologists Limited

Technology Centre, Wolverhampton Science Park, Glashier Drive, Wolverhampton
West Midlands, WV10 9RU. Tel: 01902 824111, Fax: 01902 824112
email: info@bclhydro.co.uk, web: http://www.bclhydro.co.uk
Registered Office: 33, Wolverhampton Road, Cannock, West Midlands, WV11 1AP
Registered in England & Wales. Company Registration Number: 4043373

AIRFIELD QUARRY - WATER FEATURES SURVEY

Conducted by P Burfitt and G Meetca. 24th/25th September 2018.

X	Y	Point	Description
410939	195306	1:D	Ditch: 2 m wide and 1 m deep on northern side of road (main drainage channel under road). Dry.
411203	195531	2:P	Pond: Ampney Pits LWS. Main pond 30 m x 70 m at eastern end of site, surrounded by woodland. Water is very cloudy green and stagnant. All ponds SE are dry (no standing water).
410266	195692	3:S	Ampney Brook (main channel): 4 m wide, water is around 10 cm deep, 1 m/sec surface flow velocity.
409656	196044	4:S	Footpath at Church Farm. Stream is 3 m wide, mostly dry - some small puddles but no flow.
409803	196158	5:S	Ampney Brook (main channel): 6 m wide, water is 0.3 m deep in standing section, 0.15 m deep in flowing section. Flow of up to 1 m/sec.
412033	196799	6:S	Drainage: no flow of water, some small puddles, 1.5 m deep.
412148	196473	7:D	Ditch: no flow of water, some small puddles, 1.5 m deep.
408982	195319	8:S	Former Canal route: 2 m wide, water up to 20 cm deep, GB reading = 0.16 m. Flow estimated at 5 l/s.
408926	195183	9:S	Stream: 1 m wide, water up to 15 cm deep. Flow estimated at 0.5 l/s flowing south.
408780	195371	10:S	Stream: 1 m wide, water up to 15 cm deep, <0.1 l/s flow at bridge crossing
408674	194927	11:S	River Churn (note - flow split between former canal [8:S] and this channel): 5 m wide, water up to 40 cm deep. Flowing east at approx 10 l/s
409735	194779	12:P	Pooled water: Under bridge, 10 m wide, water around 0.5m deep, unable to view full extent.
409448	197305	13:S	Stream: 2 m wide, water up to 20 cm deep, 0.5 l/s.
409307	197308	14:S	Stream: 3 m wide, water is 25 cm deep, little to no flow.
409639	197584	15:S	Ampney Brook: 4-5 m wide, water is 40-50 cm deep, Approx 5 l/s flow towards the south.
409469	198098	16:D	Ditch: 1.5 m deep, 0.5-1 m wide. Water is 5-10 cm deep and covered with vegetation along course. Very low flow (<0.1 l/s). Ditch becomes dry 50m north on eastern side of bridleway.
409367	198435	17:S	Channel: 1.5 m wide, 1.5 - 2 m deep. Completely dry and bed is not boggy
410244	197077	18:S	Channel: 3-5 m wide, 2 m deep compared to GL. Mostly dry with some small (<50cm) puddles with <5 cm of water in them. Some vegetation has begun growing in the bed.
410952	197650	19:D	Ditch: 0.5 m deep, 0.5 m wide. Dry on southern side of Duke's Field and also dry on eastern side of road next to culvert.
413221	197037	20:S	Stream: 0.5 -1 m wide, 2 m below GL, 5-15 cm of water, 0.2l/s flow. Drainage ditch alongside bridleway is dry (50 cm wide, 1 m deep).
413768	197006	21:P	Pond: 50 m x 50 m. Dry - ground is very boggy with no standing water.
412716	196691	22:D	Ditch: 1 m deep, 1 m wide. Dry on both sides of bridleway.
412212	196001	23:S	Stream: 2 m wide. Water is 10-15 cm deep, low flow of around 4 l/s
411330	198950	24:S	Stream: 1.5 m - 2 m wide. Water is around 10-15 cm deep. Very low flow (<0.1 l/s)
411718	198686	25:D	Ditch: 1 m wide, 50 cm deep. Dry. Ditch alongside field boundary also dry
411712	198406	26:D	Ditch: 1 m wide, 50 cm deep. Dry.
411594	198382	27:S	Stream: Joining main channel from west. 1.5 m wide, 0.4 m deep. Dry. Bed is not boggy and is filled with dead leaves.
410716	194813	28:P	Lagoon: Manmade and lined water circulation lagoons - Eysey Manor Quarry.
410085	194342	29:S	River Churn: 5 m wide, water around 0.5m deep. Flowing southeast at approx 10 l/s.
411059	194469	30:S	Ampney Brook: Approx. 5m wide, water is 0.5m deep, Approx 10l/s flow towards the south.
411210	194055	31:S	River Thames: Approx. 8m wide, water around 1m depth(around 1m below adjacent bank level). V slow movement to the east.
411478	194526	32:S	Former canal: Dry in base of feature and in drainage running adjacent to north and south (approx 1.5mbgl).
412227	195350	33:S	Former canal: standing water present in base of canal at bridge. No visible flow and around 0.25m deep.
412358	195872	34:S	Channel: Maintained drainage channel some 2m deep and 3m wide. Water level around 0.25m in base. No visible flow.
413087	195515	35:S	River Thames: Approx. 8m wide, water around 1m depth(around 2m below adjacent bank level). No visible movement. Pond shown adjacent to river on OS - dry.
412386	196214	36:S	Drainage: Approx. 2m wide running past Whetstone Quarry - standing water in base of feature.
412087	196065	37:S	Channel: Approx 4m wide and 1.5m deep. Water level around 0.25m and flow around 4l/s. Main channel conveying water south from eastern section of Airfield site.
411414	195637	38:S	Drainage: Approx. 1m and 1m deep, wide running southeast from main road. Dry.
412748	197885	39:S	Marston Meysey Brook: Approx 3m wide and 1.5m deep. Water level around 0.15m and flow around 8l/s. Eastern channel of upstream Marston Meysey Brook.
412479	197103	40:S	Marston Meysey Brook: Approx 3m wide and 1m deep. Water level around 0.15m and flow around 12.5l/s.
410499	197488	41:P	Pond: Shown on OS but no longer visible/in existence on ground.
410473	197608	42:P	Pond: Approx 10x20m. Water level around 1mbgl.
410645	197771	43:S	Spring: Shown on OS. No visible flow at time of survey. Dry.
411786	197486	44:P	Pond: Concrete lined reservoir. Looks to be lined but no access.
412697	196927	45:P	Pond: Approx. 5mx30m. Water level around 1m below ground level, formed on flat area adjacent to Marston Meysey Brook.
412879	196405	46:P	Pond: Series of ponds restored within Roundhouse Quarry. No access but water level around 2m below adjacent ground level.
412796	196464	47:W	Well: shown on OS. No access at time of survey but also not visible at point marked on map. Property located immediately adjacent to Roundhouse and expected to have been affected by that if still in existence.
411070	195178	48:P	Pond: Waterbody formed within part restored area at Eysey Manor Quarry. Water level around 2m below adjacent ground level, 1m above base of deposit.
410754	197158	49:D	Drainage: Manmade deep channel (around 2m), draining towards Down Ampney village. 0.15m water in base and no visible flow.
409278	195577	50:P	Pond: Waterbodies in Latton village. Houses built around flanks. Waterlevel estimated as 1.5m below adjacent ground level.

X	Y	Point	Description
413000	196250	Roundhouse Farm	Roundhouse Farm Quarry – former quarry restored to a series of groundwater fed ponds. Water level around 1.5m below surrounding ground level.
412500	196000	Whetstone Quarry	Whetstone Quarry – Current quarry operations. Most northwestern are has been worked and is currently left as an unlined flooded void. Water level around 1.5m below surrounding ground level.
411000	195000	Eysey Manor Quarry	Eysey Manor Quarry – Current quarry operations. Northeastern area closest to Airfield Quarry has been worked and currently left as openwaterbody. Water level around 1.5mbgl. Some clay lining along the northern flank of waterbody. Area to west of causeway road is being infilled (back to agriculture), using inert infill.

Spot flow gauge exercise (Ampney and Marston Meysey Brooks): 8th May 2019. P Burfitt and G Meetca.

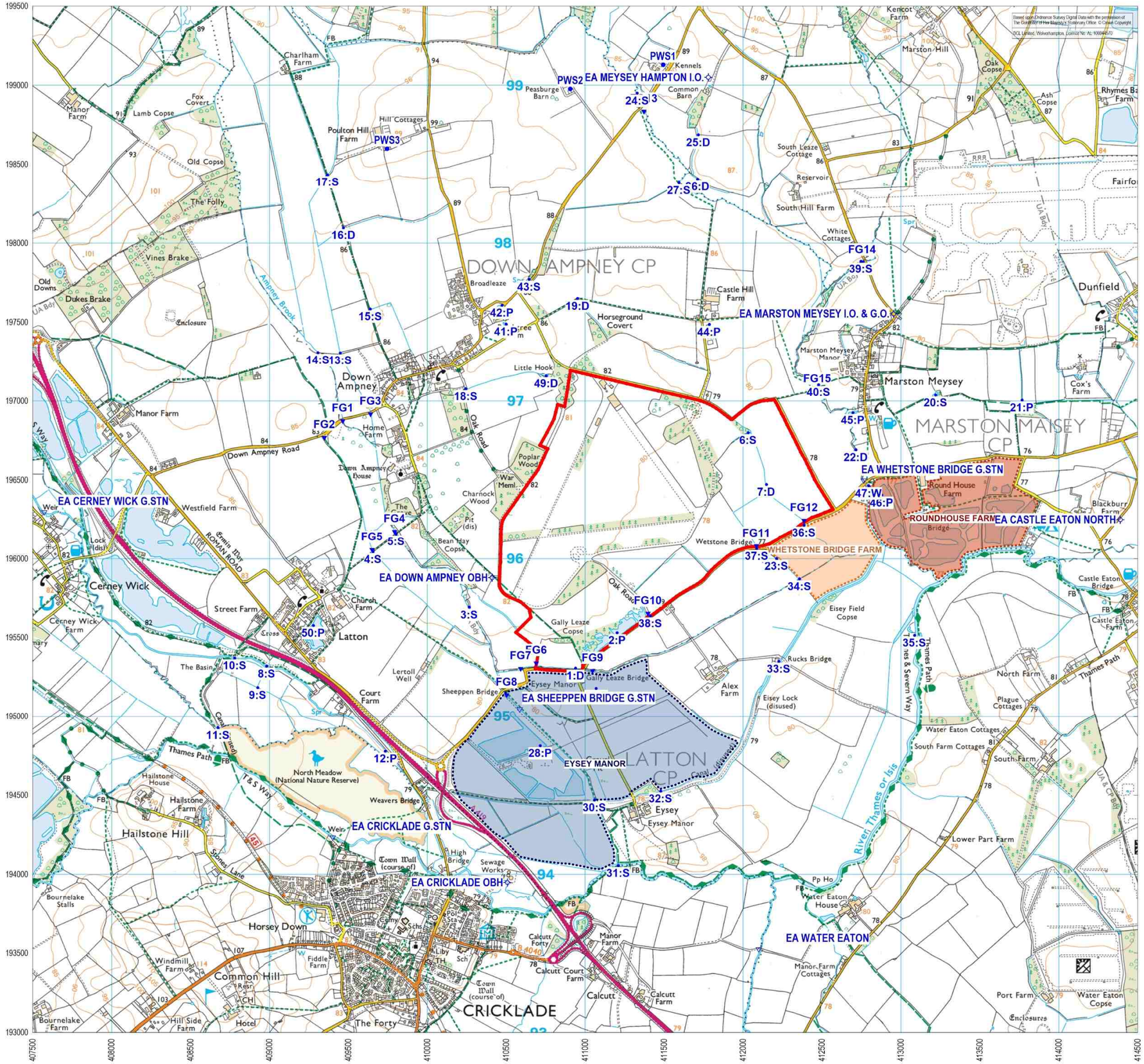
X	Y	Point	Calculated flow (litres/second)
409465	196868	FG1	239.2
409348	196764	FG2	0.5
409641	196912	FG3	15.7
409793	196169	FG4	478.2 - Not ideal gauge location (likely overestimate).
409650	196053	FG5	2
410691	195334	FG6	Dry
410592	195299	FG7	Dry
410503	195131	FG8	324
411047	195285	FG9	Dry
411398	195647	FG10	Damp
412086	196077	FG11	15
412387	196239	FG12	Dry
411372	198829	FG13	6
412755	197872	FG14	8
412471	197054	FG15	12.5

Other flow observations

Date	Location	Flow observation (litres/sec)	Date	Location	Flow observation (litres/sec)
15/08/2019	6:S	Dry	07/04/2021	6:S	4
	36:S	Dry		36:S	Damp - no flow
	37:S	7		37:S	17
	38:S	Dry		37a:S	6
	Gain	7		38:S	Damp - no flow
02/09/2019	6:S	No vis flow		Gain	13
	36:S	Dry	10/05/2021	6:S	6
	37:S	5		36:S	4
	38:S	Dry		37:S	40
	Gain	5		37a:S	24
05/11/2019	6:S	15		38:S	Dry
	36:S	Floodwater backing up to watercourse		Gain	34
	37:S	Floodwater backing up to watercourse	09/06/2021	6:S	1
	38:S	Floodwater backing up to watercourse		36:S	Damp - no flow
	Gain	Floodwater backing up to watercourse		37:S	11
03/12/2019	6:S	10		37a:S	7
	36:S	Floodwater backing up to watercourse		38:S	Dry
	37:S	Floodwater backing up to watercourse		Gain	10
	38:S	3	12/07/2021	6:S	1
	Gain	Floodwater backing up to watercourse		36:S	Damp - no flow
06/01/2020	6:S	11		37:S	11
	36:S	0.5		37a:S	5
	37:S	200		38:S	Dry
	38:S	0.5m deep - no vis flow		Gain	11

Date	Location	Flow observation (litres/sec)	Date	Location	Flow observation (litres/sec)
	Gain	189	11/08/2021	6:S	0.25
04/02/2020	6:S	12.5		36:S	Dry
	36:S	1		37:S	7
	37:S	375		37a:S	5
	38:S	0.5m deep - no vis flow		38:S	Dry
	Gain	363		Gain	7
05/03/2020	6:S	25	06/09/2021	6:S	Damp - no flow
	36:S	5		36:S	Dry
	37:S	Floodwater backing up to watercourse		37:S	4
	38:S	Floodwater backing up to watercourse		37a:S	3
	Gain	Floodwater backing up to watercourse		38:S	Dry
22/06/2020	6:S	5		Gain	4
	36:S	0.25	07/10/2021	6:S	1
	37:S	15		36:S	Damp - no flow
	38:S	Dry		37:S	11
	Gain	10		37a:S	7
06/07/2020	6:S	0.25		38:S	Dry
	36:S	Dry		Gain	10
	37:S	11	04/11/2021	6:S	6
	37a:S	9		36:S	2
	38:S	Dry		37:S	30
	Gain	11		37a:S	18
04/08/2020	6:S	Damp - no flow		38:S	Dry
	36:S	Dry		Gain	24
	37:S	4	03/12/2021	6:S	1
	37a:S	1		36:S	Damp - no flow
	38:S	Dry		37:S	17
	Gain	4		37a:S	6
07/09/2020	6:S	3		38:S	Dry
	36:S	Damp - no flow		Gain	16
	37:S	18	06/01/2022	6:S	26
	37a:S	12		36:S	5
	38:S	Dry		37:S	75
	Gain	15		37a:S	36
08/10/2020	6:S	22		38:S	Dry
	36:S	16		Gain	49
	37:S	63	08/02/2022	6:S	8
	37a:S	13		36:S	No flow
	38:S	Dry		37:S	38
	Gain	41		37a:S	18
05/11/2020	6:S	47		38:S	Damp - no flow
	36:S	19		Gain	30
	37:S	113	09/03/2022	6:S	9
	37a:S	19		36:S	0.25
	38:S	Dry		37:S	38
	Gain	66		37a:S	30
01/12/2020	6:S	11		38:S	Damp - no flow
	36:S	2		Gain	29
	37:S	90	06/04/2022	6:S	4

Date	Location	Flow observation (litres/sec)	Date	Location	Flow observation (litres/sec)
	37a:S	36		36:S	No flow
	38:S	Dry		37:S	34
	Gain	79		37a:S	18
06/01/2021	6:S	38		38:S	Dry
	36:S	6		Gain	30
	37:S	Floodwater backing up to watercourse			
	37a:S	54			
	38:S	Floodwater backing up to watercourse			
	Gain	Floodwater backing up to watercourse			
08/02/2021	6:S	28			
	36:S	4			
	37:S	Floodwater backing up to watercourse			
	37a:S	48			
	38:S	Floodwater backing up to watercourse			
	Gain	Floodwater backing up to watercourse			
09/03/2021	6:S	6			
	36:S	2			
	37:S	30			
	37a:S	18			
	38:S	Damp - no flow			
	Gain	24			



Key

Airfield Quarry site boundary

B/LMM/AQ_ESSD/22

Hills Quarry Products Limited

Airfield Quarry, Gally Leaze, Gloucestershire

Environmental Setting and Site Design

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Figure 1: Water features survey – location plan

Drawn By: PB	**Scale: 1:20,000**
Date: Sep 22	**Format: A3L**

Hills Quarry Products Limited

Airfield Quarry

Gally Leaze, Gloucestershire

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Appendix 3 Kempsford Raingauge – Monthly totals

BCL HYDRO
BCL Consultant Hydrogeologists Limited

Technology Centre, Wolverhampton Science Park, Glashier Drive, Wolverhampton
West Midlands, WV10 9RU. Tel: 01902 824111, Fax: 01902 824112
email: info@bclhydro.co.uk, web: http://www.bclhydro.co.uk
Registered Office: 33, Wolverhampton Road, Cannock, West Midlands, WV11 1AP
Registered in England & Wales. Company Registration Number: 4043373

Environment Agency Kempsford Raingauge - Monthly totals

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1961	87.9	64.5	6.6	103.6	26.7	36.1	62.1	52.2	59.7	79	30.9	111.8	721.1
1962	107.5	11.7	31.2	60.2	58.2	5	31.3	118.2	77.9	28	51.5	64.4	645.1
1963	0	9.5	95.2	53.5	39.7	76.8	47.1	63.3	43.5	45.8	130.6	21	626
1964	19.7	23.8	72.7	52.9	58.7	50	23.6	19.5	22.6	25.7	50.6	63.4	483.2
1965	68.9	7.2	56.7	50.5	70.4	75.3	71.9	34.1	96.2	12.9	66.9	130	741
1966	38.5	101.3	15.3	84.4	57.7	41.8	57.2	85.6	39.8	120.9	38.7	74.9	756.1
1967	40.2	95.5	42.4	25.9	134.9	34	34.1	39.4	70.8	148.7	31.1	62.4	759.4
1968	58	28.7	31.6	56.2	63.7	132.5	117.9	67.4	117.1	71.3	56.9	87.9	889.2
1969	58.3	47.2	54.9	34.4	106.7	19.9	45.4	98.4	24.9	10.7	71.2	68	640
1970	66.8	46.5	44.3	67.9	28.5	36.3	64.5	71.1	47.2	27.7	136.8	27.1	664.7
1971	123.1	23.3	57.3	64	55.4	120.5	14.5	86.6	16.2	109.8	59.8	35.1	765.6
1972	63.2	61.6	56.9	59.4	77.7	35.6	29.9	17.2	31	24.2	51.1	103.2	611
1973	28.9	17.4	13.3	56.2	59.1	76.6	108.3	38.8	47	27.1	31	32.8	536.5
1974	83.2	90.2	26.5	7.7	20.5	47.3	33.1	86.3	127.4	45.8	76.2	48.2	692.4
1975	93.8	40.6	73.9	33.2	27.3	7.5	55.3	19.6	98	14.5	44.1	32.8	540.6
1976	20.2	22.3	29.5	10.4	33.3	25.8	23.2	25.1	109.7	99.1	54.1	92.6	545.3
1977	0	120.1	62.6	38.3	41.1	105.3	7.2	131	15.4	38.7	64.5	68.1	692.3
1978	77.8	39.2	47.6	45.9	26.2	39.7	87.7	30	20.5	2.6	25.1	112.2	554.5
1979	49.1	50.2	115	37.4	104.4	29.2	14.1	62.3	16.4	54	52.2	117.4	701.7
1980	45.3	49.7	85.5	15.1	22.4	93.4	54.2	62.5	58.6	71.5	45.5	33.5	637.2
1981	29	25.6	130.2	31	87.5	21.6	38.2	28.5	123.1	81.9	48.8	88.4	733.8
1982	48.1	36	94.7	25.9	14.6	85.2	28	28.4	98.5	75.2	92	83.8	710.4
1983	64.4	14.2	50.8	74.7	97.8	11.5	49.1	20.4	66.8	45.1	38.1	55.1	588
1984	102.7	38.1	37.7	0.4	68.1	25.3	10.5	29.3	92.2	60.9	153	50.4	668.6
1985	50.8	46.9	55.2	28.3	77.4	93.2	41.9	94.6	15.1	40.1	46.9	107.6	698
1986	80.3	3.7	61.2	58.4	74.6	18.6	30.3	81.4	28.1	69.7	98.8	70.2	675.3
1987	4.2	47.5	62.2	57.2	34.7	102.8	64.3	22.3	32.7	137.9	69.5	31.1	666.4
1988	95.4	46.7	58.5	25.4	37	34.3	105.4	66.7	50.7	61.3	27.1	15.6	624.1
1989	36.8	67.7	48.3	63.2	10.8	38.1	26	44.5	39.6	82.6	38.8	143.5	639.9
1990	75.7	95.9	15.6	29	3.8	43.2	25.9	25	39.4	50.7	26.8	66.8	497.8
1991	78.9	22.6	57.4	62.2	8	94.8	63.8	8	53	40.5	74.1	16.6	579.9
1992	44.3	24	45.7	53.5	46.5	45.6	79.9	141	68.4	65.5	140.8	58.1	813.3
1993	98	6.8	33.3	65.7	87.6	48.2	66.2	27.9	83.3	76.9	43.2	120.1	757.2
1994	89	69.6	50.5	42.4	88.3	21.8	42.6	41.6	74	63.3	57.4	114.5	755
1995	132.3	86.5	44.3	16.9	47.4	8.7	9.1	1.4	123.8	57.5	70.5	102.5	700.9
1996	36.3	60.3	41.5	57.5	31.3	17.6	36.8	65	28.1	54.3	74.6	29.7	533
1997	8.8	94.3	13.3	25.9	59.2	69.1	26.8	133.7	13	54.3	89.9	72.1	660.4
1998	79	13.5	75	98	58	114.5	25.8	36.6	97.5	132.8	63.3	82.7	876.7
1999	123.3	35.4	38.3	69.7	64.3	67.4	2.7	114.7	84.4	63.1	48.3	106	817.6
2000	23.6	81.9	20.5	151.9	87.7	40.8	30.4	54.3	96.9	128.6	111.6	121.7	949.9

2001	54.2	68	78.7	88.1	26.7	37.2	47.5	68.9	32.1	104.1	40.4	25.1	671
2002	85.6	102.3	39.2	47	68.7	66.3	100.5	62.6	17.4	135.2	126.8	99.8	951.4
2003	77.1	23.1	35	44.5	59.5	43.3	75.3	9.3	16.6	30.5	86.5	82.9	583.6
2004	91.1	31.2	47	69.6	39.8	37.7	55.8	126.4	36.4	127.4	32.7	53.8	748.9
2005	29.5	20.1	60.4	49.8	41	52.1	52.6	43.3	34.1	77.6	61	64.4	585.9
2006	19.9	34.9	72.4	27.7	82.1	10.4	0	68	ndr	ndr	ndr	ndr	315.4
2007	ndr	ndr	ndr	ndr	ndr	ndr	ndr	ndr	ndr	ndr	ndr	ndr	
2008	ndr	ndr	74.7	30.3	106.8	77.7	121.4	78.2	93.6	36.5	81.3	50.5	751
2009	59.5	62.3	24.9	35.7	33.6	58.3	80.2	69.4	10	58.9	125.4	76.1	694.3
2010	77.1	54.8	49.2	18.1	26.7	35.3	27.9	113.4	33.2	47.7	53.7	30.6	567.7
2011	63	54.6	12.5	2.3	36.6	47.4	36.5	38.3	38.9	36.2	42.5	94.9	503.7
2012	55.8	---	22	120.3	47.9	137.8	80.5	104.1	58.6	79.4	124.2	128.8	959.4
2013	81.8	35.5	70.6	23.7	58.5	22	46.6	17.2	49.4	103.4	52.7	143	704.4
2014	175.8	118.3	35.4	57.7	73.9	35.4	19.2	80.7	11.6	69.1	85.4	56.8	819.3
2015	78.8	40.1	22.2	14.4	60.5	18.5	57.4	56.4	34.9	48.1	82.7	91.9	605.9
2016	79.3	67.6	84	48.1	42.5	103.1	12	71.7	49	20.2	103	26.7	707.2
2017	67.8	27.8	42	8.2	69.4	31.3	81.3	54.2	54	28.1	44.4	104.7	613.2
2018	66.1	25.5	104.4	62	66.8	6.6	13.2	45.8	31.8	15	71.4	84	592.6
2019	30.7	40.4	49.4										

LTA (1961- 2018)	64.2	47.9	51.4	48.1	55.1	51.1	47.3	59.3	54.5	62.8	67.8	73.9	683.2

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Hills Quarry Products Limited

Airfield Quarry

Gally Leaze, Gloucestershire

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Appendix 4 Airfield Quarry water quality data

BCL HYDRO
BCL Consultant Hydrogeologists Limited

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West Midlands, WV10 9RU. Tel: 01902 824111, Fax: 01902 824112
email: info@bclhydro.co.uk, web: http://www.bclhydro.co.uk
Registered Office: 33, Wolverhampton Road, Cannock, West Midlands, WV11 1AP
Registered in England & Wales. Company Registration Number: 4043373

Airfield Quarry	Analyte:	2,3,6-TBA	2,4,5-T	2,4-D	2,4-DB	Benazolin	Bentazon	Bromoxynil	Clopyralid	Dicamba	Dichloroprop	Fluroxypyr	Ioxynil	MCPA	MCPB	Mecoprop	Pentachlorophenol	Picloram	Silvex	Triclopyr	Benzene	Ethyl Benzene	m/p Xylenes	o Xylene	Toluene	Xylenes	Ammoniacal Nitrogen as NH3	Ammonia (Free) as N calc a	GRO-HSA o	Antimony as Sb (Dissolved)	Arsenic as (Dissolved)	Cadmium as Cd (Dissolved)	Chromium as Cr (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Manganese as Mn (Dissolved)	Mercury as Hg (Dissolved)	Molybdenum as Mo (Dissolved)	Nickel as Ni (Dissolved)	Selenium as Se (Dissolved)	Zinc as Zn (Dissolved)	Barium as Ba (Dissolved) a	Boron as B (Dissolved) a	Calcium as Ca (Dissolved) a	Iron as Fe (Dissolved) a	Magnesium as Mg (Dissolved) a	Potassium as K (Dissolved) a	Sodium as Na (Dissolved) a	Total Sulphur as SO4 (Dissolved) a	Fluoride as F a	Ammoniacal Nitrogen as N	Chloride as Cl w	Nitrate as N	Nitrite as N	Phosphate as P
Water quality data	Units:	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Location ID	Sample date																																																						
SW1	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 5.0	< 5.0	< 10.0	< 5.0	< 5.0	<15	0.01	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	0.003	<0.002	0.02	0.03	126	0.13	2	1	46	37	0.1	0.01	70	18	<0.01	0.02
SW2	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 5.0	< 5.0	< 10.0	< 5.0	< 5.0	<15	0.06	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02	0.14	125	0.12	4	8	50	30	0.4	0.05	58	18.1	0.06	0.03
SW3	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 5.0	< 5.0	< 10.0	< 5.0	< 5.0	<15	0.04	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.002	0.02	0.03	142	0.14	3	2	11	27	0.1	0.03	14	14.9	0.02	0.03
SW4	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 5.0	< 5.0	< 10.0	< 5.0	< 5.0	<15	0.15	<0.01	< 0.100	<0.001	0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03	0.03	174	0.17	6	6	15	103	0.1	0.12	28	0.6	0.02	0.03
P1-18	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 5.0	< 5.0	< 10.0	< 5.0	< 5.0	<15	0.02	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02	0.04	123	0.12	4	1	10	21	0.1	0.02	19	16	<0.01	0.02
P4-18 1.19	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.04	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	0.003	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03	0.09	157	0.15	4	2	106	26	0.1	0.03	223	2.4	<0.01	0.02
P5-18 1.04	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	<0.01	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02	0.05	128	0.2	3	4	10	14	0.2	<0.01	9	28.5	<0.01	0.02
P6-18 1.99	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.01	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03	0.04	136	0.2	5	11	9	56	<0.1	0.01	16	3.2	<0.01	0.02
P2-18	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 5.0	< 5.0	< 10.0	< 5.0	< 5.0	<15	<0.01	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02	0.03	115	0.18	3	<1	10	22	<0.1	<0.01	14	12.9	<0.01	<0.01
P3-18	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 5.0	< 5.0	< 10.0	< 5.0	< 5.0	<15	<0.01	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.04	0.06	154	0.21	3	3	18	60	0.1	<0.01	16	5.5	<0.01	<0.01
P9-18	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.05	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	0.002	<0.002	0.04	0.06	167	0.21	4	7	107	45	0.2	0.04	162	4.8	<0.01	<0.01
P7-18	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	<0.01	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.002	<0.001	<0.002	<0.0001	<0.001	<0.001	0.003	<0.002	0.09	0.02	106	0.18	5	2	10	16	0.2	<0.01	12	1.5	<0.01	<0.01
P8-18	21/02/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	<0.01	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	0.001	0.011	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03	0.1	122	0.18	5	6	92	34	0.1	<0.01	105	7.3	<0.01	<0.01
SW2	08/05/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.06	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02		109	0.17	4	12	64	28	0.6	0.05	64	11.2	<0.01	<0.01
SW4	08/05/2019	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<1	<1	<1	<1	<1	<2	1.09	0.02		<0.001	0.002	<0.0001	<0.001	0.001	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	0.002	0.02		125	0.21	5	9	16	26	0.2	0.9	29	<0.2	<0.01	0.42
P1-18	08/05/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02		135	0.18	3	1	10	22	0.1	0.02	12	13.7	<0.01	<0.01
P2-18	08/05/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.01		127	0.17	3	<1	11	24	0.2	0.01	15	11.9	<0.01	<0.01
P3-18	08/05/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.04		163	0.19	3	4	17	58	0.2	0.02	14	4.7	<0.01	<0.01
P7-18	08/05/2019	< 0.04	< 0.06	< 0.04	< 0.05	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	<1	<1	<1	<1	<1	<2	0.12	<0.01		<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.06		130	0.18	10	4	21	55	0.4	0.1	30	3	<0.01	0.4
P8-18	08/05/2019	< 0.04	< 0.06	< 0.04	< 0.05	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.002	0.03		99	0.15	4	5	105	22	0.2	0.02	56	4.3	<0.01	<0.01
P9-18	08/05/2019	< 0.04	< 0.06	< 0.04	< 0.05	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	<1	<1	<1	<1	<1	<2	0.1	<0.01		<0.001	<0.001	<0.0001	<0.001	0.002	<0.001	0.008	<0.0001	<0.001	0.001	0.002	0.016	0.03		165	0.2	4	8	123	48	0.2	0.08	144	13.2	0.02	<0.01
SW2	28/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02		< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.05	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02		160	0.2	5	11	16	27	0.1	0.04	20	25	0.03	0.02
SW4	28/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02		< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.36	<0.01		<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	0.078	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02		135	0.28	5	11	14	23	0.1	0.3	27	<0.2	<0.01	0.19
P9 - 18	27/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.07	<0.01		<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	0.002	<0.0001	<0.001	<0.001	0.001	<0.002	0.03		152	0.19	3	8	87	35	0.2	0.06	108	15.8	0.01	0.01
P1 - 18	27/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.003	0.01		130	0.17	3	1	10	20	0.1	0.01	11	15	<0.01	<0.01
P2 - 18	27/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.01		134	0.17	3	1	12	19	0.1	0.01	36	12.2	<0.01	<0.01
P3 - 18	27/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.07	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	0.024	<0.0001	<0.001						161	0.2	3	4	14	47	0.1	0.06	14	6.9	<0.01	0.02
P4 - 18	27/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.05	<0.01		<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	0.005	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03		156	0.2	4	3	115	29	0.2	0.04	172	4.6	<0.01	0.01
P5 -18	27/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.06	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	0.001	<0.001	<0.001	<0.002	0.03		110	0.14	2	2	5	20	0.2	0.05	2	4.6	<0.01	<0.01
P6 - 18 2.56	28/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	0.001	<0.002	0.03		128	0.17	3	26	8	15	<0.1	0.02	14	2.5	<0.01	<0.01
P7 - 18 2.43	28/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03		145	0.18	4	11	22	31	<0.1	0.02	30	19.4	<0.01	<0.01
P8 - 18 2.43	28/06/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	0.004	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02		104	0.16	4	6	108	23	0.2	0.02	66	4.4	<0.01	<0.01
SW4	31/07/2019															< 0.04					<1	<1	<1	<1	<1	<2	7.28	0.1		<0.001	0.004	<0.0001	<0.001	<0.001	<0.001	0.388	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03		117	0.87	4	8	12	4	0.1	6	26	<0.2	<0.01	1.12
P1-18 2.17	29/07/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	<0.01	<0.01		<0.001	<0.001	0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.01		139	0.24	3	1	10	22	0.1	<0.01	14	16.2	<0.01	<0.01
P2-18 1.48	29/07/2019	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.02		165	0.25	4	1	22	19	0.1	0.02	109	11.6	<0.01	<0.01
P3-18 1.76	29/07/2019	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.04		161	0.25	3	2	11	34	0.1	0.01	14	10.3	<0.01	<0.01
P4-18 1.87	29/07/2019	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	<1	<1	<1	<1	<1	<2	<0.01	<0.01		<0.001	<0.001	0.0001	<0.001	<0.001	<0.001	0.112	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03		157	0.23	4	3	36	36	0.2	<0.01	74	1.1	0.09	<0.01
P5-18 1.42	31/07/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.05	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.003	0.02		123	0.2	2	2	5	16	0.2	0.04	4	7.3	<0.01	<0.01
P6-18 2.68	31/07/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.002	0.03		125	0.21	3	20	9	15	<0.1	0.01	13	2.8	<0.01	<0.01
P7-18 2.65	31/07/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	<0.002	0.03		137	0.21	4	8	17	30		0.01	23	22.9	<0.01	<0.01
P8-18 2.54	31/07/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.007	0.02		91	0.17	3	6	98	18		0.02	65	4.5	<0.01	<0.01
P9-18 1.94	31/07/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.11	<0.01		<0.001	<0.001	<0.0001	<0.001	0.002	<0.001	0.019	<0.0001	<0.001	0.001	<0.001	0.007	0.03		160	0.23	4	6	65	36	0.2	0.09	91	19.9	0.09	<0.01
P1-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.91	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.004	0.03	0.03	157	1.29	3	1	38	20		0.75	138	10.8	<0.01	0.01
P2-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.56	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.119	0.32	0.08	136	1.23	3	<1	10	24		0.46	12	16.5	<0.01	0.01
P3-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.97	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	0.007	<0.0001	<0.001	<0.001	<0.001	0.182	0.16	0.07	140	1.29	2	2	13	51		0.8	17	5.2	<0.01	<0.01
P4-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.68	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.002	<0.001	0.031	<0.0001	<0.001	0.001	<0.001	0.184	0.16	0.05	182	1.34	4	4	106	35		0.56	261	3	<0.01	0.01
P5-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.44	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	<0.002	<0.0001	<0.001	0.001	0.001	0.168	0.44	0.12	121	1.19	2	<1	8	20		0.36	5	10.5	<0.01	0.01
P6-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.29	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.16	0.18	0.06	131	1.22	3	15	9	19		0.24	16	3.1	<0.01	0.01
P7-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.19	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	<0.002	<0.0001	<0.001	<0.001	<0.001	0.171	0.33	0.09	131	1.22	4	6	16	30		0.16	23	21.7	<0.01	0.01
P8-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.79	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.002	<0.001	0.015	<0.0001	<0.001	0.001	<0.001	0.181	0.16	0.38	91	1.09	3	6	94	18		0.65	70	4	<0.01	<0.01
P9-18	27/08/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.5	<0.01	< 0.100	<0.001	<0.001	<0.0001	<0.001	0.001	<0.001	0.098	<0.0001	<0.001	0.001	<0.001	0.19	0.16	0.13	149	1.27	4	5	58	32		0.41	99	13.1	0.11	<0.01
SW1	26/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.05	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.011	0.03		152	0.03	4	8	22	30	0.2	0.04	30	17.7	0.04	<0.01
SW2	26/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.05	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.004	0.03		153	0.03	4	9	23	30	0.2	0.04	30	17.3	0.09	<0.01
SW4	25/09/2019															0.26					<1	<1	<1	<1	<1	<2	0.27	<0.01		<0.001	0.001	<0.00002	<0.001	<0.001	<0.001	0.026	<0.00003	0.002	<0.001	<0.001	0.009	0.04		258	0.09	7	11	18	395	0.1	0.22	22	2.8	<0.01	<0.01
P1	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.08	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.007	0.02		137	0.03	2	<1	11	21	0.1	0.07	12	18.3	<0.01	<0.01
P2	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.02		149	0.03	3	1	48	21	0.1	0.02	114	11.7	<0.01	<0.01
P3	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.06	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	0.011	<0.00003	<0.001	0.001	<0.001	0.009	0.04		159	0.04	3	3	15	56	0.1	0.05	17	6.1	0.01	<0.01
P4	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.04	<0.01	<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	0.016	<0.00003	<0.001	<0.001	0.001	0.005		0.05		218	0.05	5	5	151	33	0.2	0.03	358	4	<0.01	<0.01
P5-18	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.04	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	0.001	0.007	0.02		131	0.03	2	1	7	12	0.2	0.03	4	14	<0.01	<0.01
P6-18	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.05	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	0.001	0.017	0.03		135	0.03	3	15	12	23	<0.1	0.04	17	4.3	<0.01	<0.01
P7-18	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.004	0.04		138	0.03	3	8	16	29	0.1	0.02	16	21.3	<0.01	<0.01
P8-18	26/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.005	0.03		109	0.03	3	8	90	25	0.2	0.02	67	5.1	<0.01	<0.01
P9-18	25/09/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.1	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	0.177	<0.00003	<0.001	0.001	<0.001	0.011	0.04		159	0.03	4	5	60	34	0.2	0.08	94	12.5	0.04	<0.01
SW1	31/10/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	0.00003	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		158	<0.01	5	5	17	22	0.2	0.02	20	14.7	<0.01	<0.01
SW2	31/10/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		153	<0.01	5	4	16	23	0.2	0.01	20	14.6	<0.01	<0.01
SW3	31/10/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.01	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.01		139	<0.01	4	2	10	19	0.1	0.01	13	5.9	0.01	<0.01
SW4	31/10/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.06	<0.01		<0.001	<0.001	0.00003	<0.001	0.002	<0.001	0.007	<0.00003	<0.001	<0.001	<0.001	0.004	0.04		168	<0.01	5	10	14	26	0.2	0.05	21	2.2	0.19	0.03
P1-18	30/10/2019															0.03					<1	<1	<1	<1	<1	<2	<0.01	<0.01		<0.001	<0.001	<0.00002	0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		155	<0.01	3	1	14	21	0.1	<0.01	15	16.1	<0.01	<0.01
P2-18	30/10/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.002	0.02		154	<0.01	3	1	22	19	0.1	0.02	21	20.6	<0.01	<0.01
P3-18	30/10/2019															< 0.02					<1	<1	<1	<1	<1	<2	0.04	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.04		183	<0.01	3	4	16	49	0.1	0.03	16	6.3	0.02	<0.01

Airfield Quarry	Analyte:	2,3,6-TBA	2,4,5-T	2,4-D	2,4-DB	Benazolin	Bentazon	Bromoxynil	Clopyralid	Dicamba	Dichloroprop	Fluroxypyr	Ioxynil	MCPA	MCPB	Mecoprop	Pentachlorophenol	Picloram	Silvex	Triclopyr	Benzene	Ethyl Benzene	m/p Xylenes	o Xylene	Toluene	Xylenes
P4-18	30/10/2019															< 0.04					<1	<1	<1	<1	<1	<2
P5-18	30/10/2019															< 0.02					<1	<1	<1	<1	<1	<2
P6-18	30/10/2019															< 0.02					<1	<1	<1	<1	<1	<2
P7-18	30/10/2019															< 0.02					<1	<1	<1	<1	<1	<2
P8-18	30/10/2019															< 0.02					<1	<1	<1	<1	<1	<2
P9-18	30/10/2019															< 0.02					<1	<1	<1	<1	<1	<2
SW1	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW2	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW3	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW4	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P1-18 1.34	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P2-18 0.65	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P3-18 1.29	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P4-18 0.90	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P5-18 1.04	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P6-18 1.64	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P7-18 1.50	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P8-18 1.78	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P9-18 1.60	28/11/2019		<0.03	<0.04						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW1	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW2	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW3	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW4	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P1-18 1.49	05/12/2019		<0.01	<0.03						<0.03	<0.04			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P2-18 0.82	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P3-18 1.53	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P4-18 0.96	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P5-18 1.13	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P6-18 1.82	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P7-18 1.61	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P8-18 1.88	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P9-18 1.86	05/12/2019		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW1	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW2	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW3	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW4	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P1-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P2-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P3-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P4-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P5-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P6-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P7-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P8-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P9-18	07/01/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW1	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW2	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW3	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW4	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P1-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P2-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P3-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P4-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P5-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P6-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P7-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P8-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P9-18	06/02/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW1	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW2	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
SW3	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P1-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P2-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P3-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P4-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P5-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P6-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P7-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P8-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2
P9-18	06/03/2020		<0.03	<0.03						<0.04	<0.02			<0.02	<0.02	<0.02					<1	<1	<1	<1	<1	<2

Airfield Quarry	Analyte:	Ammoniacal Nitrogen as NH3	Ammonia (Free) as N calc a	GRO-HSA o	Antimony as Sb (Dissolved)	Arsenic as (Dissolved)	Cadmium as Cd (Dissolved)	Chromium as Cr (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Manganese as Mn (Dissolved)	Mercury as Hg (Dissolved)	Molybdenum as Mo (Dissolved)	Nickel as Ni (Dissolved)	Selenium as Se (Dissolved)	Zinc as Zn (Dissolved)	Barium as Ba (Dissolved) a	Boron as B (Dissolved) a	Calcium as Ca (Dissolved) a	Iron as Fe (Dissolved) a	Magnesium as Mg (Dissolved) a	Potassium as K (Dissolved) a	Sodium as Na (Dissolved) a	Total Sulphur as SO4 (Dissolved) a	Fluoride as F a	Ammoniacal Nitrogen as N	Chloride as Cl w	Nitrate as N	Nitrite as N	Phosphate as P
P4-18	30/10/2019	<0.01	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.01		155	<0.01	3	1	13	20	0.1	<0.01	16	15.8	<0.01	<0.01
P5-18	30/10/2019	<0.01	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	0.001	<0.002	0.02		145	<0.01	2	2	7	14	0.2	<0.01	5	12.9	<0.01	<0.01
P6-18	30/10/2019	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.03		149	<0.01	3	21	9	15	<0.1	0.02	13	3	<0.01	<0.01
P7-18	30/10/2019	0.05	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.05		162	<0.01	4	8	18	27	0.1	0.04	18	17.7	<0.01	<0.01
P8-18	30/10/2019	0.02	<0.01		<0.001	<0.001	0.00003	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.03		110	<0.01	3	7	104	16	0.2	0.02	64	6.4	<0.01	<0.01
P9-18	30/10/2019	0.02	<0.01		<0.001	<0.001	0.00003	<0.001	0.002	<0.001	0.079	<0.00003	<0.001	0.001	0.001	0.003	0.03		183	<0.01	4	6	53	47	0.2	0.02	51	1.9	<0.01	<0.01
SW1	28/11/2019	0.11	<0.01		<0.001	<0.001	0.00003	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.02		117	<0.01	3	4	15	15	0.2	0.09	18	5.7	0.05	0.02
SW2	28/11/2019	0.05	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.002	0.02		145	<0.01	4	7	27	24	0.3	0.04	36	12.1	0.03	0.03
SW3	28/11/2019	0.36	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.01		123	<0.01	4	3	9	19	0.1	0.3	15	6.1	0.12	0.07
SW4	28/11/2019	3.64	0.07		<0.001	0.002	0.00003	<0.001	<0.001	<0.001	0.133	<0.00003	<0.001	<0.001	<0.001	0.004	0.02		151	0.06	5	7	16	36	0.1	3	36	<0.2	0.02	0.46
P1-18 1.34	28/11/2019	0.24	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	0.005	<0.00003	<0.001	<0.001	<0.001	0.177	0.01		140	<0.01	3	<1	20		0.1	0.2	13	14.2	<0.01	<0.01
P2-18 0.65	28/11/2019	0.24	<0.01		<0.001	<0.001	0.00003	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.01	0.02		136	<0.01	3	1	19		0.1	0.2	15	24.6	<0.01	<0.01
P3-18 1.29	28/11/2019	0.25	<0.01		<0.001	<0.001	0.00003	<0.001	<0.001	<0.001	0.006	<0.00003	<0.001	<0.001	<0.001	0.006	0.04		159	<0.01	3	3	48		<0.1	0.21	15	7.5	0.02	<0.01
P4-18 0.90	28/11/2019	0.34	<0.01		<0.001	<0.001	<0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		114	<0.01	3	4	28		0.2	0.28	51	<0.2	0.03	<0.01
P5-18 1.04	28/11/2019	0.3	<0.01		<0.001	<0.001	<0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.02		113	<0.01	2	1		6	0.2	0.25	4	5.3	0.01	<0.01
P6-18 1.64	28/11/2019	0.34	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.03		114	<0.01	3	18		16	<0.1	0.28	14	2.8	<0.01	<0.01
P7-18 1.50	28/11/2019	0.39	<0.01		<0.001	<0.001	0.00003	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	0.001	<0.001	0.007	0.11		154	<0.01	4	6		22	0.1	0.32	27	11.7	<0.01	<0.01
P8-18 1.78	28/11/2019	0.58	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	0.002	<0.002	0.02		121	<0.01	3	2		12	0.1	0.48	41	1.7	<0.01	<0.01
P9-18 1.60	28/11/2019	0.13	<0.01		<0.001	<0.001	0.00003	<0.001	0.003	<0.001	0.005	<0.00003	<0.001	0.002	<0.001	0.012	0.03		170	<0.01	3	6		47	0.2	0.11	24	<0.2	<0.01	0.02
SW1	05/12/2019	0.17	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		147	<0.01	4	4	28	21	0.3	0.14	34	8.6	0.02	0.02
SW2	05/12/2019	0.17	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		150	<0.01	5	8	46	28	0.4	0.14	53	13.6	0.03	0.03
SW3	05/12/2019	0.15	<0.01		<0.001	<0.001	0.0001	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.01		111	<0.01	5	3	10	23	0.2	0.12	16	5.9	0.03	0.01
SW4	05/12/2019	3.52	0.07		<0.001	0.002	<0.00002	<0.001	<0.001	<0.001	0.228	<0.00003	<0.001	<0.001	<0.001	0.002	0.02		164	0.09	6	7	17	34	0.1	2.9	36	0.2	0.07	0.52
P1-18 1.49	05/12/2019	0.02	<0.01		<0.001	<0.001	0.00003	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.005	0.01		152	<0.01	3	<1	<0.02	12	19	0.1	0.02	13	21	<0.01
P2-18 0.82	05/12/2019	0.04	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.005	0.02		135	<0.01	3	<1	16	18	0.1	0.03	15	24.1	<0.01	<0.01
P3-18 1.53	05/12/2019	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	0.002	<0.001	0.005	<0.00003	<0.001	<0.001	<0.001	0.007	0.04		168	<0.01	3	4	15	51	0.1	0.02	16	5.8	<0.01	<0.01
P4-18 0.96	05/12/2019	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	0.004	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.005	0.02		93	<0.01	2	1	173	18	0.3	0.02	111	1.8	<0.01	<0.01
P5-18 1.13	05/12/2019	<0.01	<0.01		<0.001	<0.001	<0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.006	0.02		130	<0.01	2	1	6	11	0.1	<0.01	3	12.4	<0.01	0.02
P6-18 1.82	05/12/2019	0.01	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	0.018	<0.00003	<0.001	<0.001	<0.001	0.006	0.03		29	0.11	5	2	12	16	<0.1	0.01	14	3.2	<0.01	<0.01
P7-18 1.61	05/12/2019	<0.01	<0.01		<0.001	<0.001	<0.00002	<0.001	0.003	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.008	0.1		167	<0.01	4	6	23	28	0.1	<0.01	33	14.9	<0.01	<0.01
P8-18 1.88	05/12/2019	0.05	<0.01		<0.001	<0.001	0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	0.001	<0.002	0.02		121	<0.01	3	2	45	12	0.1	0.04	41	1.7	<0.01	<0.01
P9-18 1.86	05/12/2019	0.06	<0.01		<0.001	<0.001	0.00002	<0.001	0.002	<0.001	0.005	<0.00003	<0.001	0.001	<0.001	0.003	0.03		169	<0.01	3	7	29	47	0.2	0.05	24	<0.2	<0.01	<0.01
SW1	07/01/2020	0.06	<0.01		<0.001	<0.001	0.00003	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.017	0.02		139	<0.01	3	<1	16	19	0.2	0.05	20	21	0.01	<0.01
SW2	07/01/2020	0.05	<0.01		<0.001	<0.001	0.00007	<0.001	<0.001	<0.001	0.002	<0.00003	<0.001	<0.001	<0.001	0.01	0.02		143	<0.01	4	7	26	27	0.2	0.04	31	12.4	0.02	0.01
SW3	07/01/2020	0.05	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	0.008	<0.00003	<0.001	<0.001	0.001	0.006	0.01		139	0.01	3	2	25	27	0.1	0.04	31	5.4	0.02	<0.01
SW4	07/01/2020	2.55	0.04		<0.001	0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.007	0.02		144	0.04	4	5	17	24	0.2	2.1	30	<0.2	0.03	0.37
P1-18	07/01/2020	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.005	0.01		146	<0.01	3	<1	11	20	0.1	0.02	12	23.8	<0.01	<0.01
P2-18	07/01/2020	0.07	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.039	0.02		133	<0.01	3	<1	13	19	0.1	0.06	16	22.6	<0.01	<0.01
P3-18	07/01/2020	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	0.018	<0.00003	<0.001	<0.001	<0.001	0.004	0.04		155	<0.01	2	3	14	50	0.1	0.02	15	5.3	0.02	<0.01
P4-18	07/01/2020	0.27	<0.01		<0.001	<0.001	0.00003	<0.001	0.002	<0.001	0.008	<0.00003	<0.001	<0.001	<0.001	0.006	0.02		116	<0.01	3	3	140	21	0.3	0.22	137	0.5	0.01	<0.01
P5-18	07/01/2020	0.02	<0.01		<0.001	<0.001	0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.017	0.02		115	0.01	2	1	6	7	0.2	0.02	4	6.2	<0.01	<0.01
P6-18	07/01/2020	0.04	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.03		130	<0.01	3	15	9	13	<0.1	0.03	18	3	<0.01	<0.01
P7-18	07/01/2020	0.07	<0.01		<0.001	<0.001	0.00003	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.007	0.07		154	<0.01	4	7	22	28	0.1	0.06	36	12.9	<0.01	0.01
P8-18	07/01/2020	0.1	<0.01		<0.001	<0.001	<0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.002	0.02		93	<0.01	2	6	74	11	0.2	0.08	42	2.1	<0.01	<0.01
P9-18	07/01/2020	0.06	<0.01		<0.001	<0.001	0.00004	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	0.001	<0.001	0.003	0.03		155	<0.01	3	18	19	41	0.2	0.05	24	1.1	<0.01	<0.01
SW1	06/02/2020	0.05	<0.01		<0.001	<0.001	<0.00002	<0.001	0.001	<0.001	0.003	<0.00003	<0.001	0.006	<0.001	<0.002	0.02		140	<0.01	3	<1	15	25	0.2	0.04	19	19.8	0.02	<0.01
SW2	06/02/2020	0.02	<0.01		<0.001	<0.001	0.00006	<0.001	<0.001	<0.001	0.004	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		148	<0.01	4	6	18	30	0.2	0.02	24	12.6	<0.01	<0.01
SW3	06/02/2020	0.02	<0.01		<0.001	<0.001	0.00004	<0.001	<0.001	<0.001	0.019	<0.00003	<0.001	<0.001	0.001	<0.002	0.01		144	0.01	3	2	14	28	0.1	0.02	20	6.3	<0.01	<0.01
SW4	06/02/2020	0.73	0.03		<0.001	0.001	<0.00002	<0.001	<0.001	<0.001	0.02	<0.00003	<0.001	<0.001	<0.001	<0.002	0.01		118	0.03	4	3	9	17	0.1	0.6	19	1.6	0.06	0.27
P1-18	06/02/2020	0.04	<0.01		<0.001	<0.001	0.00009	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.01		151	<0.01	3	<1	9	21	<0.1	0.03	13	27.2	<0.01	<0.01
P2-18	06/02/2020	0.04	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.003	0.01		131	<0.01	3	<1	11	20	0.1	0.03	18	17.5	<0.01	<0.01
P3-18	06/02/2020	0.01	<0.01		<0.001	<0.001	0.00006	<0.001	<0.001	<0.001	0.008	<0.00003	<0.001	<0.001	<0.001	<0.002	0.04		165	<0.01	3	2	12	53	<0.1	0.01	14	8.7	0.02	<0.01
P4-18	06/02/2020	0.15	<0.01		<0.001	<0.001	0.00003	<0.001	0.003	<0.001	0.05	<0.00003	<0.001	0.001	<0.001	0.003	0.02		105	<0.01	3	4	125	22	0.2	0.12	123	0.5	0.01	<0.01
P5-18	06/02/2020	0.08	<0.01		<0.001	<0.001	<0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.005	0.01		86	<0.01	2	<1	3	4	0.2	0.07	2	2.7	<0.01	<0.01
P6-18	06/02/2020	0.05	<0.01		<0.001	<0.001	0.00003	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.005	0.02		102	<0.01	2	9	5	9	<0.1	0.04	20	1.7	<0.01	<0.01
P7-18	06/02/2020	0.02	<0.01		<0.001	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.004	0.07		178	<0.01	4	6	20	31	0.1	0.02	58	9.2	0.02	<0.01
P8-18	06/02/2020	0.05	<0.01		<0.001	<0.001	0.00011	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.01		74	<0.01	2	3	35	7	0.1	0.04	32	2.3	<0.01	<0.01
P9-18	06/02/2020	0.04	<0.01		<0.001	<0.001	<0.00002	<0.001	0.002	<0.001	0.008	<0.00003	<0.001	<0.001	<0.001	<0.002	0.03		150	<0.01	3	17	15	39	0.2	0.03	31	0.6	<0.01	<0.01
SW1	06/03/2020	0.05	<0.01		0.005	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.01		68	<0.01	3	3	20	16	0.2	0.04	28	3.2	0.05	0.01
SW2	06/03/2020	<0.01	<0.01		0.006	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		131	<0.01	4	6	28	24	0.3	<0.01	36	9.1	0.04	0.03
SW3	06/03/2020	0.01	<0.01		0.005	<0.001	0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.002	<0.01		104	<0.01	4	1	7	18	0.1	0.01	15	5.5	0.1	0.02
P1-18	06/03/2020	0.02	<0.01		0.005	<0.001	<0.00002	<0.001	<0.001	<0.001	0.007	<0.00003	<0.001	<0.001	<0.001	0.004	0.01		120	<0.01	2	<1	9	20	0.1	0.02	16	15.9	<0.01	0.01
P2-18	06/03/2020	<0.01	<0.01		0.005	<0.001	<0.00002	<0.001	<0.001	<0.001	0.01	<0.00003	<0.001	<0.001	<0.001	0.006	0.01		136	<0.01	2	<1	8	20	0.1	<0.01	14	24.7	<0.01	0.01
P3-18	06/03/2020	0.05	<0.01		0.005	<0.001	<0.00002	<0.001	0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	0.002	0.04		162	0.08	3	3	10	44	<0.1	0.04	12	15.4	<0.01	<0.01
P4-18	06/03/2020	0.08	<0.01		0.005	<0.001	<0.00002	<0.001	0.003	<0.001	0.12	<0.00003	<0.001	0.001	<0.001	0.005	0.03		127	<0.01	4	3	16	19	0.2	0.07	33	0.4	<0.01	<0.01
P5-18	06/03/2020	<0.01	<0.01		0.004	<0.001	<0.00002	<0.001	0.003	<0.001	<0.002	<0.00003	<0.001	0.001	<0.001	0.008	0.02		100	0.16	2	2	4	7	0.2	<0.01	3	4.2	<0.01	0.02
P6-18	06/03/2020	0.04	<0.01		0.004	<0.001	<0.00002	<0.001	<0.001	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		136	0.04	3	11	8	12	<0.1	0.03	19	0.9	<0.01	<0.01
P7-18	06/03/2020	0.06	<0.01		0.005	<0.001	<0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.08		172	<0.01	4	5	17	21	0.1	0.05	50	5.1	0.02	<0.01
P8-18	06/03/2020	0.02	<0.01		0.005	<0.001	<0.00002	<0.001	0.002	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.02		105	<0.01	2	3	26	8	0.1	0.02	27	1.1	<0.01	0.01
P9-18	06/03/2020	<0.01	<0.01		0.006	<0.001	<0.00002	<0.001	0.003	<0.001	<0.002	<0.00003	<0.001	<0.001	<0.001	<0.002	0.03		126	<0.01	2	20	15	31	0.2	<0.01	25	0.3	<0.01	0.01

Airfield Quarry	Analyte:	Total Oxidised Nitrogen as N	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Benzo-a-Pyrene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAH (Sum of USEPA 16)	PCB101	PCB118	PCB138	PCB153	PCB180	PCB28	PCB52	Dimethylphenols	Methyl Phenols	Phenol	Total Phenols	Trimethylphenols	Orthophosphate as PO4	Total Sulphur as S (Dissolved) a	Cyanide (Total) as CN	TPH Band >C10-C12	TPH Band >C12-C16	TPH Band >C16-C21	TPH Band (>C21-C35)	TPH Band >C8-C10	TPH GC	Suspended Solids w	Chemical Oxygen Demand (Settled)	Bicarbonate Alkalinity as CaCO3 w	Carbonate Alkalinity as CaCO3 w	Total Alkalinity as CaCO3 w	Total Organic Carbon w	Total Acidity as CaCO3 w	Conductivity uS/cm @ 25C w	Biochemical Oxygen Demand w	pH units w
Water quality data	Units:	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	uS/cm	mg/l	pH units
Location ID	Sample date																																																		
SW1	21/02/2019	18	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.06	12.3	<0.02	< 0.010	< 0.010	< 0.010	0.017	< 0.010	0.024	562	<5	213	0	213	1.6	Nil	830	<2.0	7.5
SW2	21/02/2019	18.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.09	9.99	<0.02	< 0.010	< 0.010	< 0.010	0.025	< 0.010	0.034	45	<5	258	0	258	1.7	Nil	870	<2.0	7.9
SW3	21/02/2019	15	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.09	8.99	<0.02	< 0.010	< 0.010	< 0.010	0.029	< 0.010	0.039	47	8	255	0	255	3	Nil	686	<2.0	7.8
SW4	21/02/2019	0.7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.09	34.2	<0.02	< 0.010	< 0.010	< 0.010	0.027	< 0.010	0.035	264	28	293	0	293	9.7	Nil	827	<2.0	7.9
P1-18	21/02/2019	16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.06	6.99	<0.02	< 0.010	< 0.010	< 0.010	0.02	< 0.010	0.026			203	0	203	1.1	Nil	605		
P4-18 1.19	21/02/2019	2.4	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.06	8.7	<0.02	< 0.010	< 0.010	0.01	0.06	< 0.010	0.089	188		261	0	261	2.2	Nil	1270		7.5
P5-18 1.04	21/02/2019	28.5	< 0.01	< 0.01	< 0.01	0.01	0.03	0.01	0.01	0.02	0.02	< 0.01	0.03	< 0.01	0.02	< 0.01	0.01	0.03	< 0.25	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.06	4.7	<0.02	< 0.010	< 0.010	< 0.010	0.017	< 0.010	0.025	1150		164	0	164	1.7	Nil	623		7.6
P6-18 1.99	21/02/2019	3.2	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.06	18.7	<0.02	< 0.010	< 0.010	< 0.010	0.016	< 0.010	0.027	5840		264	0	264	1	Nil	644		7.4
P2-18	21/02/2019	12.9	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	7.33	<0.02	< 0.010	< 0.010	< 0.010	0.029	< 0.010	0.039			205	0	205	0.6				7.4
P3-18	21/02/2019	5.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	20	<0.02	< 0.010	< 0.010	< 0.010	0.022	< 0.010	0.031			296	0	296	1.5				7.2
P9-18	21/02/2019	4.8	< 0.01	< 0.01	< 0.01	0.01	0.03	0.02	< 0.01	0.02	0.02	< 0.01	0.04	< 0.01	0.02	< 0.01	0.02	0.04	< 0.27	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	15	0.02	< 0.010	0.041	0.018	0.092	< 0.010	0.169			358	0	358	3.3				7.4
P7-18	21/02/2019	1.5	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	5.33	<0.02	< 0.010	< 0.010	< 0.010	0.045	< 0.010	0.074			256	0	256	3.4				7.6
P8-18	21/02/2019	7.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	11.3	0.02	< 0.010	< 0.010	< 0.010	0.039	< 0.010	0.062			325	0	325	1				7.6
SW2	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03									214	8	255		0	2.9	255	799	<2.0	7.7
SW4	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	1.29									14	40	274		0	14	274	612	2.5	7.7
P1-18	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03												0	231	0.89		606	231	7.6
P2-18	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03												0	221	0.84		576	221	7.6
P3-18	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03												0	281	1.6		723	281	7.6
P7-18	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	1.22											269	0	269	0.97		694		7.7
P8-18	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											333	0	333	1.4		872		7.7
P9-18	08/05/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											352	0	352	3.5		1300		7.4
SW2	28/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.06									7	7	268	0	268	2.2		762	<1.0	8.2
SW4	28/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.58									6	30	315	0	315	11		641	<2.0	7.7
P9 - 18	27/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.03											310	0	310	3		991		7.4
P1 - 18	27/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											236	0	236	0.96		582		7.5
P2 - 18	27/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											226	0	226	0.75		616		7.6
P3 - 18	27/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.06											297		0	1.5	297	706		7.3
P4 - 18	27/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.03											298		0	2.2	298	1120		7.4
P5 -18	27/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											243		0	1.8	243	510		7.4
P6 - 18 2.56	28/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											292	0	292	1.1		608		7.6
P7 - 18 2.43	28/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											249	0	249	1.7		735		7.5
P8 - 18 2.43	28/06/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											333	0	333	1.5		870		7.4
SW4	31/07/2019																										<0.05	0.11	<0.05	<0.26	<0.05	3.43									248	39	297		0	13	297	613	8.7	7.6
P1-18 2.17	29/07/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											237	0		0.54		464	237	7.4
P2-18 1.48	29/07/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											212	0		0.5		727	212	7.5
P3-18 1.76	29/07/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											287	0		1.2		484	287	7.5
P4-18 1.87	29/07/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											294	0		3		690	294	7.6
P5-18 1.42	31/07/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											247		0	0.71	247	519		7.5
P6-18 2.68	31/07/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											289		0	0.64	289	607		7.5
P7-18 2.65	31/07/2019														<0.1												<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											246	0	246	1.3		709		7.4
P8-18 2.54	31/07/2019														0.2												<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											325	0	325	1.1		807		7.5
P9-18 1.94	31/07/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											296		0	2.9	296	968		7.4
P1-18	27/08/2019	10.8	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.03	6.66	<0.02	< 0.010	< 0.010	< 0.010	0.011	< 0.010	0.015	788	<5	213	0	213	0.51	Nil	981	<5.7	7.4
P2-18	27/08/2019	16.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.03	7.99	<0.02	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.012	938	<5	227	0	227	0.47	Nil	643	<5.7	7.4
P3-18	27/08/2019	5.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	17	<0.02	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.013	101	5	298	0	298	1.4	Nil	731	<5.7	7.4
P4-18	27/08/2019	3	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.03	11.7	<0.02	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.011	203	6	295	0	295	2	Nil	1430	<3.6	7.3
P5-18	27/08/2019	10.5	0.03	< 0.01	< 0.01	0.03	0.03	0.03	0.02	0.03	0.03	< 0.01	0.05	< 0.01	0.03	< 0.01	0.02	0.05	< 0.4	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.03	6.66	<0.02	< 0.010	< 0.010	< 0.010	0.011	< 0.010	0.015	1370	<5	253	0	253	0.69	Nil	588	<3.6	7.4
P6-18	27/08/2019	3.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.03	6.33	<0.02	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.013	237	<5	295	0	295	0.69	Nil	637	<3.6	7.4
P7-18	27/08/2019	21.7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	0.03	9.99	<0.02	< 0.010	< 0.010	< 0.010	0.012	< 0.010	0.017	593	9	243	0	243	1.2	Nil	742	<5.7	7.4
P8-18	27/08/2019	4	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.16	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	5.99	<0.02	< 0.010	< 0.010	< 0.010	0.012	< 0.010	0.021	255	8	329	0	329	1.4	Nil	868	<2.9	7.6
P9-18	27/08/2019	13.2	< 0.01	< 0.01	< 0.01	0.03	0.02	< 0.01	0.01	0.02	0.02	< 0.01	0.03	< 0.01	< 0.01	< 0.01	0.02	0.03	< 0.25	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05	<0.05	<0.20	<0.05	<0.03	10.7	<0.02	< 0.010	< 0.010	< 0.010	0.023	< 0.010	0.03	24	5	298	0	298	2.7	Nil	1030	<2.9	7.4
SW1	26/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03									<5	7	249	20	269	3		784	<1.0	7.8
SW2	26/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03									<5	7	244	14	258	3		783	<1.0	7.6
SW4	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03									32	31	157	0	157	11		1050	16.3	7.4
P1	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											224	4	228	0.87		647		7.4
P2	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											214	0	214	0.83		913		7.4
P3	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											273	0	273	1.7		727		7.3
P4	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											241	0	241	2.3		1710		7.2
P5-18	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											243	0	243	1.2		600		7.3
P6-18	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											281	0	281	1.3		668		7.4
P7-18	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											226	0	226	1.4		714		7.4
P8-18	26/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											314	0	314	1.2		899		7.4
P9-18	25/09/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											304	0	304	3.1		1020		7.2
SW1	31/10/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03									20	17	232	8	240	4.4		653	<1.0	7.8
SW2	31/10/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03									21	13	218	0	218	4.4		651	<1.0	7.8
SW3	31/10/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03									5	12	215	10	225	3.7		563	<1.0	8
SW4	31/10/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.09									14	23	271	0	271	7.9		664	<9.5	7.8
P1-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											218	0	218	1.1		620		7.5

Airfield Quarry	Analyte:	Total Oxidised Nitrogen as N	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Benzo-a-Pyrene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAH (Sum of USEPA 16)	PCB101	PCB118	PCB138	PCB153	PCB180	PCB28	PCB52	Dimethylphenols	Methyl Phenols	Phenol	Total Phenols	Trimethylphenols	Orthophosphate as PO4	Total Sulphur as S (Dissolved) a	Cyanide (Total) as CN	TPH Band >C10-C12	TPH Band >C12-C16	TPH Band >C16-C21	TPH Band (>C21-C35)	TPH Band >C8-C10	TPH GC	Suspended Solids w	Chemical Oxygen Demand (Settled)	Bicarbonate Alkalinity as CaCO3 w	Carbonate Alkalinity as CaCO3 w	Total Alkalinity as CaCO3 w	Total Organic Carbon w	Total Acidity as CaCO3 w	Conductivity uSlcm @ 25C w	Biochemical Oxygen Demand w	pH units w
P2-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											212	0	212	0.37		670		7.7
P3-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											275	0	275	1.2		715		7.6
P4-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											231	0	231	1.2		634		7.4
P5-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											283	0	283	1.1		573		7.5
P6-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											279	0	279	0.52		603		7.4
P7-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											238	0	238	1		716		7.6
P8-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											297	0	297	0.71		839		7.7
P9-18	30/10/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											343	0	343	4.3		906		7.6
SW1	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.06									7	15	231	0	231	5.9		581	1.5	7.8
SW2	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.09									12	8	270	0	270	3.4		771	<1.0	7.7
SW3	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.21									16	10	238	0	238	3.9		582	4.3	7.8
SW4	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	1.41									12	30	307	0	307	12		758	<9.5	7.8
P1-18 1.34	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											242	0	242	2		656		7.6
P2-18 0.65	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											208	0	208	0.75		672		7.6
P3-18 1.29	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											282	0	282	1.7		727		7.6
P4-18 0.90	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											290	0	290	3.3		781		7.5
P5-18 1.04	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											237	0	237	2.5		513		7.6
P6-18 1.64	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											281	0	281	0.93		615		7.4
P7-18 1.50	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											295	0	295	2.2		783		7.4
P8-18 1.78	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	<0.03											290	0	290	1.8		705		7.5
P9-18 1.60	28/11/2019																										<0.05	<0.05	<0.05	<0.20	<0.05	0.06											348	0	348	5.6		817		7.4
SW1	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	0.06									<5	11	275	0	275	4.5		725	<1.0	7.7
SW2	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	0.09									7	<5	280	0	280	2		852	1.1	7.8
SW3	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	0.03									22	7	197	0	197	3.2		522	<2.9	7.8
SW4	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	1.59									8	30	304	0	304	11		754	<9.5	7.8
P1-18 1.49	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											225	0	225	1.2		673		7.4
P2-18 0.82	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											207	0	207	0.72		673		7.4
P3-18 1.53	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											287	0	287	1.8		716		7.3
P4-18 0.96	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											390	0	390	3.8		1110		7.4
P5-18 1.13	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	0.06											227	0	227	1.4		558		7.4
P6-18 1.82	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											281	0	281	0.99		634		7.4
P7-18 1.61	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											283	0	283	1.6		811		7.3
P8-18 1.88	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											284	0	284	2		697		7.5
P9-18 1.86	05/12/2019																										<0.05	<0.05	<0.05	<0.2	<0.05	<0.03											341	0	341	5.7		812		7.2
SW1	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03									5	<5	232	0	232	1.5		678	2.3	7.4
SW2	07/01/2020																										<0.0005		<0.0005		<0.0005	0.03									<5	<5	290	0	290	2.3		753	<1.0	7.6
SW3	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03									<5	7	279	0	279	2.9		703	<2.9	7.5
SW4	07/01/2020																										<0.0005		<0.0005		<0.0005	1.13									<5	24	305	0	305	9.1		699	<9.5	7.7
P1-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											220	0	220	0.89		666		7.3
P2-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											203	0	203	0.84		644		7.3
P3-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											284	0	284	1.6		701		7.2
P4-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											341	0	341	3.2		1120		7.2
P5-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											234	0	234	1.7		506		7.4
P6-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											285	0	285	1		624		7.4
P7-18	07/01/2020																										<0.0005		<0.0005		<0.0005	0.03											282	0	282	1.7		776		7.2
P8-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											307	0	307	1.4		712		7.4
P9-18	07/01/2020																										<0.0005		<0.0005		<0.0005	<0.03											326	0	326	5.5		749		7.1
SW1	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03									133	7	229	0	229	1.5		710	10.9	7.9
SW2	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03									6	6	278	0	278	1.9		760	2	8.1
SW3	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03									42	5	284	0	284	2.3		698	<2.0	8.1
SW4	06/02/2020																										<0.0005		<0.0005		<0.0005	0.83									34	18	241	0	241	6.8		576	9.6	8.1
P1-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											218	0	218	0.64		673		7.4
P2-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											202	0	202	0.65		622		7.7
P3-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											289	0	289	1.4		713		7.4
P4-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											308	0	308	3		1040		7.8
P5-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											242	0	242	1.9		503		8
P6-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											290	0	290	1		596		7.5
P7-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											307	0	307	1.5		832		7.4
P8-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											275	0	275	1.2		643		7.5
P9-18	06/02/2020																										<0.0005		<0.0005		<0.0005	<0.03											310	0	310	4.5		760		7.7
SW1	06/03/2020																										<0.0005		<0.0005		<0.0005	0.03									82	12	165	0	165	3.7		459	<2.9	7.9
SW2	06/03/2020																										<0.0005		<0.0005		<0.0005	0.09									8	8	305	0	305	2.2		763	<1.0	7.7
SW3	06/03/2020																										<0.0005		<0.0005		<0.0005	0.06									<5	10	253	0	253	2.1		533	<1.0	7.8
P1-18	06/03/2020																										<0.0005		<0.0005		<0.0005	0.03											250	0	250	0.92		614		7.7
P2-18	06/03/2020																										<0.0005		<0.0005		<0.0005	0.03											251	0	251	0.76		686		7.5
P3-18	06/03/2020																										<0.0005		<0.0005		<0.0005	<0.03											357	0	357	1.8		790		7.4
P4-18	06/03/2020																										<0.0005		<0.0005		<0.0005	<0.03											319	0	319	3.5		676		7.4
P5-18	06/03/2020																										<0.0005		<0.0005		<0.0005	0.06											237	0	237	1.6		474		7.5
P6-18	06/03/2020																										<0.0005		<0.0005		<0.0005	<0.03											338	0	338	1.4		667		7.4
P7-18	06/03/2020																										<0.0005		<0.0005		<0.0005	<0.03											374	0	374	1.8		879		7.3
P8-18	06/03/2020																										<0.0005		<0.0005		<0.0005	0.03											300	0	300	1.7		621		7.5
P9-18	06/03/2020																										<0.0005		<0.0005		<0.0005	0.03											396	0	396	4.9		718		7.5