



Taylor Wimpey Limited

Environmental Permit Application – Supporting Notes

Former BBC Broadcasting House Studios, Llandaff, Cardiff,
CF5 2YQ

Project No. 314688 R2 (00)

January 2022



DOCUMENT CONTROL

Document Title: Environmental Permit
Application – Supporting
Notes

Former BBC Broadcasting
House Studios, Llandaff,
Cardiff, CF5 2YQ

Status: Draft Rev 01

Date of issue: January 2022

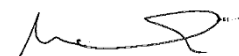
The Client: Taylor Wimpey South Wales

RSK Environment Limited (RSK) has prepared this document at the instruction Taylor Wimpey South Wales.

Author Craig Lewis



Project Manager Andrew Przewieslik



Date	Issue Number	Amendments
January 2022	00	For issue

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1 INTRODUCTION

This document is presented in support of an application for an Environmental Permit to discharge surface waters during the construction phase from the BBC Llandaff development site. Additional and supporting information to that provided in the application forms is included, and the application forms reference the various sections herein.

Sections 1 and 2 also provide a non-technical summary of the planned discharge.

The site is located within Llandaff, northwest of Cardiff city centre. The site consists of previously developed land, associated with BBC broadcasting House and is located at a National Grid reference of ST 14883 78333. The development site is wholly owned and to be developed by Taylor Wimpey South Wales, a trading name of Taylor Wimpey UK Limited.

The site is split into two development parcels that are both accessed via the A4119 (Llantrisant Road) with the main area located within the northern development parcel (4.3Ha in area), that formerly housed the main BBC building with ancillary offices and vehicle parking.

The site is currently undergoing a phased demolition starting with the Northern parcel. This parcel of the development area bounded to the west by residential properties. Bridge Road forms the northern boundary and is located approximately 2m lower than the site. An area of wooded ground and the River Taff are located 40m beyond the northern boundary, with the River Taff forming the primary surface water receptor.

The site generally slopes towards the north and north-east. As discussed, the site is currently undergoing a phased demolition and a cut and fill exercise will be undertaken to create a level development platform. It is anticipated that following re-grading work, that ground levels will continue to slope down towards the north-east.

The southern parcel of land was terraced and sloped towards the north. This site will also be subject to demolition and re-grading, although it is anticipated that ground levels will continue to slope down to the north.

Both parcels of land are drained of surface waters via a storm drain that connects directly to the River Taff at two locations, north-west and north-east of the site. The storm drain system is being intercepted and realigned to facilitate the development layout. It is unknown when the diversion will occur, however it is our understanding that Dwr Cymru will undertake these works, as principal contractor and be responsible for the working areas, commencing early December 2021. It is anticipated that this work will be completed by March 2022. Welsh Water will be responsible for the surface water discharge and quality for this duration.

A site location plan is included as **Figure 1** and a site boundary plan is included as **Figure 2**.

The proposed development will comprise the construction of traditional low rise residential dwellings and associated infrastructure including access roads, car parking areas and private driveways. The development will also include areas of soft landscaping such as public open space, play space and private gardens.

It is understood that the surface water drainage system will comprise standard highway surface water gullies across the site, and as stated previously, these will discharge storm water to two existing storm drain outfalls on the north-western and north-eastern site boundaries, respectively.

The storm drain, currently located along the western boundary of the southern and northern parcels, is to be re-routed to accommodate the new development layout.

These details are presented on drainage drawings set out within **Appendix C**.

2 SURFACE WATER DISCHARGE DESCRIPTION

A plan showing the site boundary and surface water discharge location is presented as **Figure 2** and on engineering drawings presented in **Appendix C**.

At present (December 2021), the drainage infrastructure currently in place will be utilised with regards to drainage, as the site is still at the enabling phase with demolition currently being undertaken. Surface waters migrating across the site are currently being inspected and managed for suspended solids and water volume through implementation of a number of measures as detailed with a site-specific 'Surface Water Management Plan' included within **Appendix A**.

It should be noted that the SWMP currently only covers the demolition phase of the works, however, it has been agreed by TW and RSK that this will be revised in February 2022, once demolition has been completed.

3 ENVIRONMENTAL MANAGEMENT SYSTEMS

Taylor Wimpey have environmental management systems in place. This is detailed below.

Taylor Wimpey HSE management system has been built around the requirements of both ISO14001:2004 and OHSAS18001:2007. Taylor Wimpey seek to minimise the impact of their site operations, particularly in relation to climate change, energy, water, waste biodiversity through compliance with these certified systems. Taylor Wimpey is audited on a regular basis with relevant employees provided with specific environmental training.

4 QUALITY OF DISCHARGE WATER

No geoenvironmental data has been provided for review however, it is RSK's understanding that no obvious sources of contamination have been encountered by the client on site. The site is considered brownfield due to past use as the BBC studios, however, the former land use is not expected to have resulted in significant contamination, however, the potential for unexpected soil contamination to be encountered during construction work cannot be fully discounted

Due to the absence of significant previous contaminative uses, nearby surface waters, despite their sensitivity, are at only low risk from contamination on site. As such, it is considered unlikely that the surface water to be discharged from site will contain significant concentrations of any hazardous substances.

With demolition and subsequent enabling works ongoing at the site, storage and use of fuel and lubricating oils and possibly other materials will be necessary. However, all such activities will be undertaken in accordance with current regulations and best practice.

With these controls in place construction activities present a negligible risk of causing hazardous substances to be present in the discharge water.

The only source of potential contamination identified is suspended solids as a result of exposed soils. A SWMP report has been issued to mitigate against this issue.

A copy of the report is presented within **Appendix A**.

5 RISK ASSESSMENT

An assessment of the environmental risks of the operations covered under this application for discharge consent has been prepared in accordance with the principles of the H1 methodology stated below:

- Step 1 – identify risks
- Step 2 – assess risks
- Step 3 – justify appropriate measures (if needed)
- Step 4 – present the assessment.

Step 1: Identify Risks

The H1 overview document identifies the following different types of risk to the environment.

- odour – there are no potentially odorous activities or chemicals associated with the ongoing construction works
- noise & vibration – construction noise & vibration will occur but be limited to the allowed working hours (0800-1800 Monday to Friday and 0800 to 1400 Saturday). Noise & vibration resulting from the discharge activity are not envisaged as being significantly more noticeable than from the other construction activities at the site
- accidents – the potential for accidents to occur exists. The potential for contamination of the watercourse will be managed to acceptable levels by the control measures put in place for the construction activities and as set out within the surface water management plan
- fugitive emissions to air and water - no significant risks have been identified. The potential for contamination of the watercourse will be managed to acceptable levels by the control measures put in place for the construction activities
- controlled releases to air – there are no point source emissions to air
- controlled discharges to surface water – as discussed, a discharge location has been identified at the outfall from the southern corner to a surface water, see **Figure 2**.
- controlled discharges to ground or groundwater – there are no point source discharges to groundwater
- global warming potential – insignificant at the scale of development at Llandaff
- site waste – the quantity of site waste generated will be small and consist primarily of silt/soil. All other plastic and construction related wastes are disposed of off site.

Steps 2/3/4 – Assess Risks etc

In accordance with the H1 methodology guidance the following have been assessed.

- accidents
- surface water discharges.

Due to the low permeability of soils at the site and the proximity of nearby surface waters, it is not considered necessary to consider risks to groundwater.

Accidents

The site is secure with no public access to the location of the discharge point boundary. Only a single access point to both areas of the site is present, located in the south of the northern parcel and north of the southern parcel of the site off the A4119. There is the potential for surface waters to leave the site boundary via the access point and flow across the public highway (A4119, Llantrisant Road). However, mitigation measures have been installed to manage this risk at the main site entrances to the northern parcel should have sand bags or a ramp fitted to divert water way from the main highway (Llantrisant Road). If plant or haulier movements are anticipated onto the highway, then a rumble strip close to the entrance has been advised to reduce sediment drag onto the highway.

Furthermore, a silt fence is proposed along the western perimeter of the site to prevent runoff impacting upon the off site residential properties, which are located topographically lower than the site along with retention of an ecological fence (polythene and waterproof), along the entirety of northern boundary, to prevent run off impacting the topographically lower A4054.

A risk assessment for accidents, in line with H1 Annex A, follows the next section.

Surface Water Discharges

The water to be discharged comprises rainwater having fallen on the ground within the development area and that flows across the surface into the surface drainage network. It may also at times be necessary to pump rainwater (significant groundwater entry is not anticipated) from excavations into the surface drainage network. The amount of surface water run-off requiring discharge will be dependent upon rainfall rates. Surface water run-off will be clean and uncontaminated (after solids removal).

Under conditions prior to development works, rainwater falling across the wider development would follow the topography of the land and flow to the north and northeast, leaving the site boundary via the current infrastructure, prior to entry to the highway gully system and its ultimate discharge to the River Taff some 40m north of the site.

As such, the water to be discharged during the construction period would naturally enter the watercourse identified. Under the proposals for the works there is the potential for additional solids to be mobilised due to the construction activity on site, however as stated, these will be reduced by settlement and filtration methods, and if necessary the use of a flocculant. The impact of the discharge of clean and uncontaminated water from the site can therefore be considered to be not significant in terms of the impact on the watercourse.

The use of flocculants is also requested as part of the permit application should their application be necessary during the longer term construction phase. A flocculant dosing trial has not been undertaken during these early stages, however testing will be undertaken post demolition.

The outfalls from the site to the headwall into the river north of the site boundary currently discharges nominally around 155.l/s for Site A and 133 l/s for Site B. based upon a 2 year storm return period. The calculation is based on current infrastructure and therefore the final discharge will likely be less.

A Siltbuster, or pump and settlement tank/other suitable structure with the potential to use a flocculant will be present during the initial phases of the construction programme. The need to use the pump and flocculant is for backup purposes only, should volumes of water, or the suspended solid content worsen during inclement weather. As the demolition phase is currently ongoing the need for above is not yet known, therefore as the construction/enabling phases progress information will be provided on a proposed set up should the need to implement such measures arise.

The water discharge to the River Taff is at the location shown in **Figure 2**.

The discharge will be at ambient conditions so there will be no temperature effects as a result of the discharge. As the discharge will not normally contain any hazardous substances, sanitary determinants or other pollutants, detailed assessments in line with H1 Annexes D1 and D2 are not necessary, as indicated in the flow chart of H1 Annex D. The only assessment required is for accidents. This assessment follows.

Risk Assessment for Accidents

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Leak/spillage of hazardous material on site (e.g. oils and fuels)	Localised ground and local watercourse	Leakage to ground, overland flow or pumped direct	Containment measures for storage. Minimisation of storage volumes.	Unlikely	Contamination of local watercourse with hazardous substances.	Low – due to procedures detailed in environmental management plans (e.g. fuel/oil use and storage, waste/material storage). Distance from surface water course make this implausible.
Leak of oil/fuel from pump	Localised ground and local watercourse	Via surface flow & infiltration	Containment measures for pumps. Spill kit. Sump pallet. Maintenance & inspection	Very unlikely	Contamination of local watercourse with oil/fuel.	Low – due to quantities involved and procedures detailed in environmental management plans (e.g. fuel storage/use). Distance from surface water course make this implausible.
Discharge of water containing solids (silts)	Local watercourse	Pumped direct, discharge via storm drainage system	Monitoring of discharge to be visibly free of silt.	Low likelihood	Contamination of local watercourse with solids (silts).	Low – if water is silty discharge will be suspended until sufficient settlement has occurred either via gravity or chemical applicant. A flocculent may be applied to aid settlement of suspended solids as set out in the flocculant dosing trial and using a reactor pipe, that further reduces human error in dosing concentration
Spillage of collected solids from settlement system	Local watercourse	Via surface flow	Method statement for cleaning settlement system.	Very unlikely	Contamination of local watercourse with solids (silts).	Low – settlement system to be cleaned in such a way as to prevent silt spillage. To be cleaned by specialist settlement tank provider (Siltbuster). Distance from surface water course make this implausible.

Failure of pumping equipment – overflow of water from drainage etc.	Local watercourse	Via surface flow	Discharge is pumped only. If pump fails water will build up on site but not enter watercourse.	Unlikely	Contamination of local watercourse with solids.	Low – water is contained on site if pump fails within the temporary attenuation pits.
Vandalism	Local watercourse	Via surface flow	Site is secure without public access.	Unlikely	Contamination of local watercourse.	Low due to security arrangements (pump is fenced off) and nature of discharge equipment.

6 DISCHARGE VOLUMES

The volume of water requiring discharge is dependent on rainfall. Prior to demolition the site currently discharges nominally around 159l/s and 133 l/s with regards to Site A and Site B respectively , based upon calculations assuming a 2 year storm return period..

The site is designed for free discharge. As the existing rates are significantly high, the proposed designed drainage will unlikely achieve these levels, therefore the final discharge rate will be significantly lower.

The quantity of water required to be over-pumped is currently unknown and will depend upon rainfall rates. Over-pumping is anticipated to cease prior to, or on completion of the development. On completion of the development, the permit will be surrendered.

Ground conditions at the site have been found to comprise predominantly low-permeability soils. As such, it is not expected that groundwater will contribute significantly to the discharge volumes.

7 EFFLUENT TREATMENT

If required, the discharge water will be treated to remove suspended solids, and the success of this treatment will be monitored. The treatment would comprise passing the water through a 5,000L 'silt trap' settlement tank, allowing silt to settle out. It has been noted that the use of a flocculent may be required to aid removal of suspended solids. No testing has been undertaken as of writing, due to ongoing demolition works. Tests will be undertaken during the enabling phase of the works and provided to NRW in due course.

The proposed treatment will be monitored and will only be considered successful if the discharge water does not, by visual inspection, appear to contain silt.

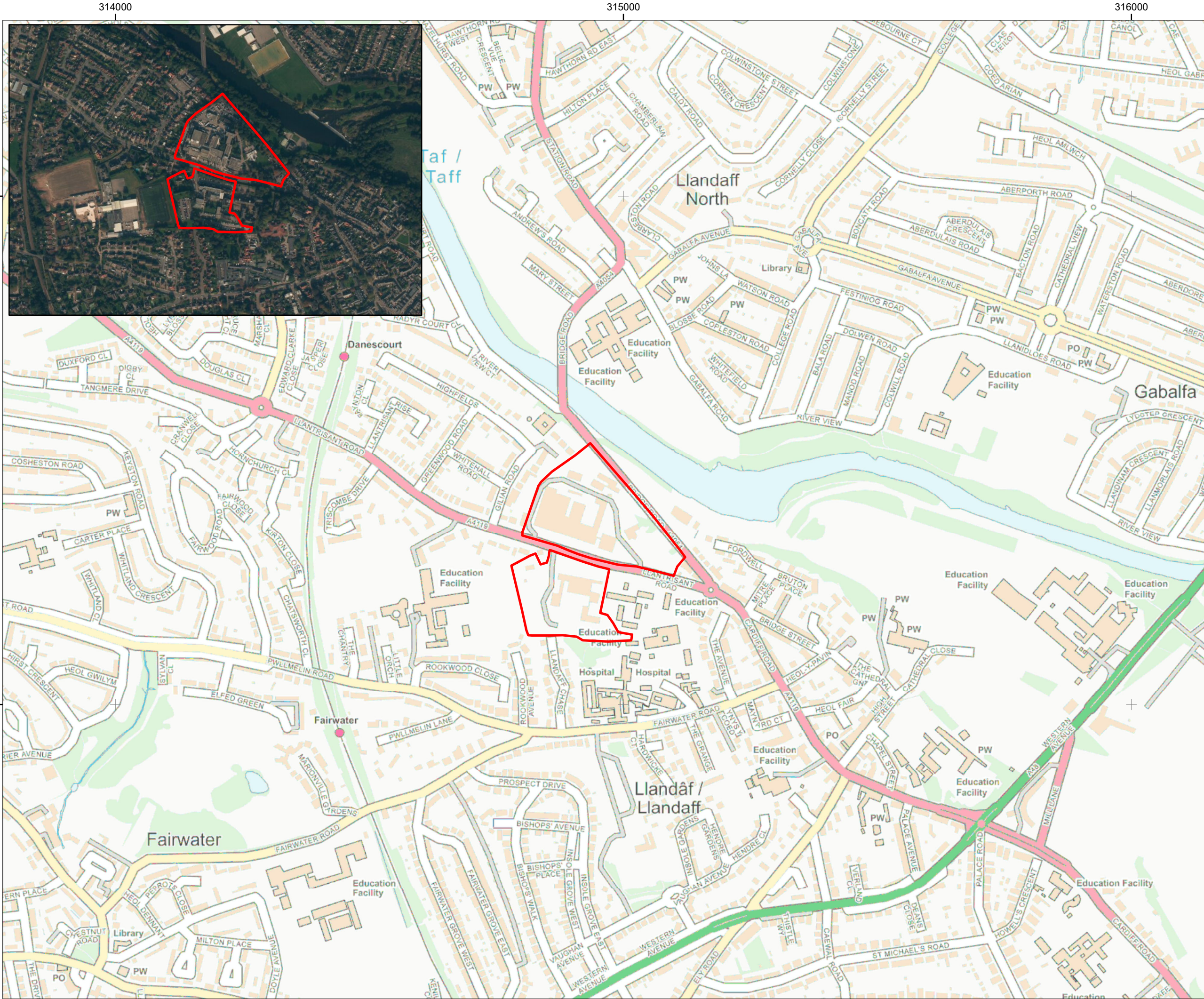
The outflow water from the settlement tanks will be monitored, and if the water appears to contain silt the pumping will be suspended until sufficient additional settlement of solids has occurred.

The proposed flocculent type and its MSDS sheet is appended at **Appendix B**.

As such, following treatment, the discharge water would be free from significant concentrations of suspended solids.

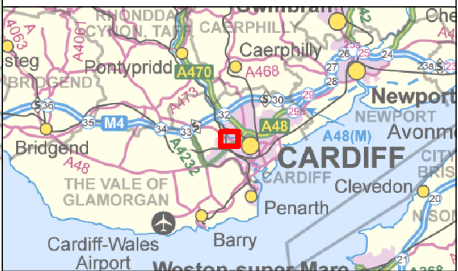
Testing of treated water for total suspended solids and pH would be undertaken at regular intervals to demonstrate that water released will not impact upon the river.

FIGURES



Legend:
Site Boundary

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

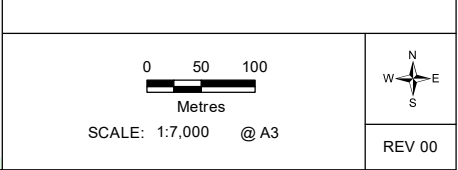


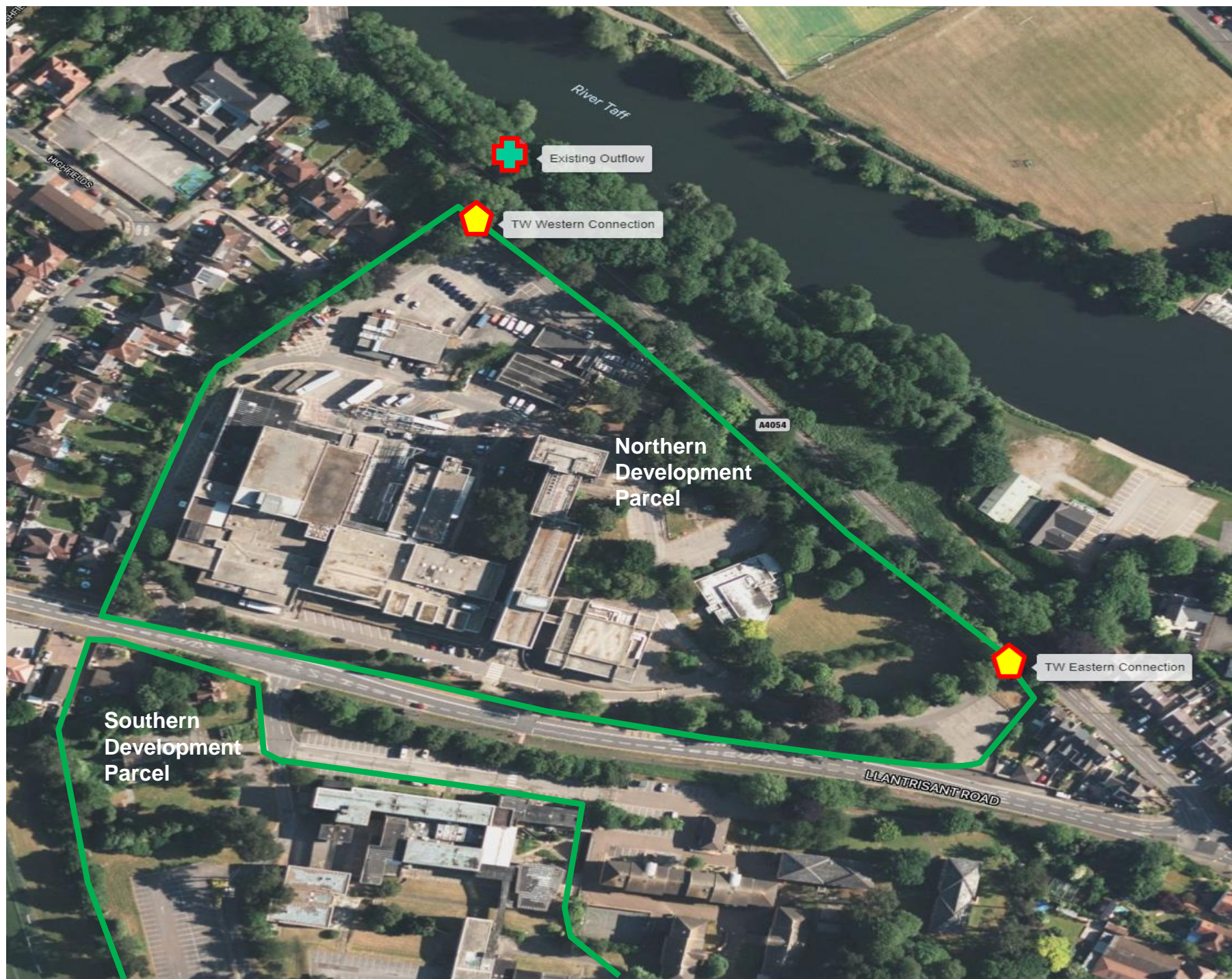
Rev	Date	Description	Drm	Chk	App
00	30/09/2021	First Draft	DR	CL	CL

Taylor Wimpey
BBC Llandaff, Cardiff



TITLE: Figure 1:
Site Location Plan





Legend:

- Site Boundary
- + Outfall Location
- ⬠ TW Connection Location

Date Drawn:
15-12-2021

Scale: NTS

Title: BBC Llandaff Outfall Location

Base Drawing Ref:



Site: BBC Llandaff, Cardiff

Client: Taylor Wimpey Ltd

Job No: 314688

Figure 2

APPENDIX A

SITE-SPECIFIC CONSTRUCTION SURFACE WATER MANAGEMENT PLAN

APPENDIX B

MSDS FOR PROPOSED FLOCCULANTS

Safety Data Sheet



Clearflow Gel Flocculant 360

1. Identification of the Product and the Company

Product Name: Clearflow Cyclone Gel Flocculant 360, Water Lynx Cyclone Block 360, Water Lynx Gel Block 360

Product Type: Solid **Chemical Family:** Anionic polymer

Material Uses: Clearflow Cyclone Gel Flocculant 360 is used as a flocculating agent in municipal and industrial water and wastewater treatment.

Supplier: Clearflow Group Inc. #140, 134 Pembina Road Sherwood Park, AB T8H 0M2
Ph. 780-410-1403 Fx. 780-410-1406 www.clearflowgroup.com

In Case of Emergency: 780-410-1403

2. Composition / Information on Ingredients

United States / Canada

Name:	CAS Number	% by Weight
Proprietary Blend	-	100%

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazard Identification

Potential Acute Health Effects

Inhalation: Inhalation of vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.

Ingestion: May cause irritation of the lining of the stomach.

Skin: Mild to Moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness.

Eyes: May cause eye irritation. May result in mild to moderate irritation to eyes.

4. First Aid Measures

Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.

Skin contact: In case of contact, rinse with soap and water. Remove contaminated clothing and launder before reuse.

Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

Notes to Physician: Treatment based on sound judgement of physician and individual reactions of patient.

**Check with your site manager
that you have consent to use
flocculant on site**

5. Fire-Fighting Measures

Flash Point: None.

Flash Point Method: Not applicable.

Autoignition Temperature: Not available.

Flammable Limits in Air (%): Not available.

Extinguishing Media

Suitable: Use an extinguishing media suitable for the surrounding fire.

Not Suitable: None known.

Hazardous Thermal Decomposition Products: Carbon and Nitrogen Oxides.

Special Protective Equipment for Fire-Fighters: Fire fighters should wear full protective clothing, including self-contained breathing equipment.

NFPA Ratings for this product are: HEALTH 1 FLAMMABILITY 0 INSTABILITY 1
HMS Ratings for this product are: HEALTH 1 FLAMMABILITY 0 REACTIVITY 1

6. Accidental Release Measures

Personal precautions: Wear appropriate protective equipment. Wet product and aqueous solutions of product are very slippery. Trace amounts of product on smooth surfaces can become extremely slippery when wet.

Environmental Precautions: Prevent entry of concentrated solutions into sewers or streams, dike if needed.

Procedure for Clean-up: Sweep or scoop dry material and place in appropriate container. Absorb aqueous solutions with a dry inert material, such as clay, and place in an appropriate waste disposal container. After most of the material has been cleaned-up clean the area with warm, soapy water.

7. Handling and Storage

Handling: For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment.

Storage: Store in a cool, dry area. Store in accordance with good industrial practices. Keep away from direct sunlight. Protect against physical damage.

8. Exposure Controls / Personal Protection

Personal Protection

Respiratory: A respirator is not be required when working with Clearflow Cyclone Gel Flocculant 360.

Hands: Use gloves appropriate for work or task being performed. Recommended: PVC, vinyl, or rubber.

Eyes: Safety eyewear should be used when there is a likelihood of exposure. Recommended: Chemical goggles; also wear a face shield if splashing hazard exists.

Skin: Skin Contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Engineering Controls: Local exhaust ventilation as necessary to maintain exposure to within applicable limits.

9. Physical and Chemical Properties			
Physical State:	Solid	Color:	White or off-white
Odor:	Slightly Acidic	pH:	~7
Specific Gravity:	~1.1	Boiling/Condensing Point:	Not available.
Melting/Freezing Point:	Not available.	Vapour Pressure:	Not available.
Vapour Density:	Not available.	% Volatile by Volume:	Not available.
Evaporation Rate:	Not available.	Solubility:	Completely soluble but dissolves very slowly.
VOCs:	Not available.	Viscosity:	Concentration dependant.
Molecular Weight:	Not available.	Other:	None

10. Stability and Reactivity	
Chemical Stability:	The product is stable.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures.
Materials to Avoid:	Strong bases such as sodium hydroxide may cause the release of ammonia.
Hazardous Decomposition Products:	At high temperatures carbon oxides and nitrogen oxides may be released upon decomposition.
Additional Information:	No additional information.

11. Toxicological Information	
Principle Routes of Exposure	
Ingestion:	May cause irritation of the lining of the stomach.
Skin contact:	Mild to moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness.
Inhalation:	Inhalation of vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.
Eye Contact:	May causes eye irritation. May result in mild to moderate irritation to eyes.
Additional Information:	Prolonged and repeated contact with the skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis.

12. Ecological Information			
Aquatic Ecotoxicity			
Ingredient	Species	Test	Result
Whole Product	<i>Oncorhynchus mykiss</i> (Rainbow Trout)	LC50 96 hr	147.5 mg/L
	<i>Daphnia magna</i>	LC50 48 hr	>1500 mg/L

Other Information:	
Bioaccumulation:	The product is not expected to bioaccumulate.
Persistence / Degradability:	Full degradation through environmental exposure is expected. Degradation initiation and rate is dependent on UV exposure.

Acute Toxicity	
Acute Oral LD50:	Oral LD50 (Rat) > 5000 mg/kg
Acute Dermal LD50:	Not available.
Acute Inhalation LC50:	Not available.

Carcinogenicity	
Acrylamide is a suspected human carcinogen.	
Carcinogenicity Comment:	No additional information available.
Reproductive Toxicity / Teratogenicity / Embryotoxicity / Mutagenicity:	Not available.

13. Disposal Considerations	
Disposal of Waste Method:	Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.
Contaminated Packaging:	Empty containers should be recycled or disposed of through an approved waste management facility.

14. Transport Information						
Regulatory Information	UN Number	Proper Shipping Name	Hazard Class	PG*	Label	Additional Information
DOT (U.S.)	-	-	-	-	-	not a regulated product
TDG (Canada)	-	-	-	-	-	not a regulated product

PG* : Packaging Group

15. Regulatory Information	
U.S. TSCA Inventory Status:	All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.
Canadian DSL Inventory Status:	All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

16. Other Information	
Additional Information:	This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the SDS contains all the information required by the CPR.
Prepared By:	Clearflow Group, Inc.
Date of Issue:	1/05/2021
Change List:	original document – 1/13/2015 data review, SDS conversion, address update – 4/08/2019 Logo update, data review, product name update – 1/05/2021

Disclaimer:	NOTICE TO READER: Clearflow, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.
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Do not use ingredient information and/or ingredient percentages in this SDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from Clearflow Group.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Clearflow makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Clearflow's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

END OF SDS

Safety Data Sheet



Clearflow Gel Block Flocculant 494

1. Identification of the Product and the Company

Product Name: Clearflow Gel Block Flocculant 494 **Product Type:** Gel Block **Chemical Family:** Coagulant/Flocculant

Material Uses: Clearflow Gel Block Flocculant 494 is used as a flocculation agent in municipal and industrial water and wastewater treatment.

Supplier: Clearflow Group Inc. 140,134 Pembina Rd Sherwood Park, AB T8H 0M2
Ph. 780-410-1403 Fx. 780-410-1406 www.clearflowgroup.com

In Case of Emergency: 780-410-1403

2. Composition / Information on Ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3. Hazard Identification

Potential Acute Health Effects

Inhalation: Inhalation of vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.
Ingestion: May cause irritation of the lining of the stomach.
Skin: Mild to Moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness.
Eyes: May cause eye irritation. May result in mild to moderate irritation to eyes.

4. First Aid Measures

Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
Skin contact: In case of contact, rinse with soap and water. Remove contaminated clothing and launder before reuse.
Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.
Notes to Physician: Treatment based on sound judgement of physician and individual reactions of patient.

5. Fire-Fighting Measures

Flash Point: Not available.

Flash Point Method: Not applicable.

Autoignition Temperature: Not available.

Flammable Limits in Air (%): Not available.

Extinguishing Media

Suitable: Use an extinguishing media suitable for the surrounding fire.
Not Suitable: None known.

Hazardous Thermal

Decomposition Products: Carbon and Nitrogen Oxides.

Special Protective

Equipment for Fire-Fighters: Fire fighters should wear full protective clothing, including self-contained breathing equipment.

NFPA Ratings for this product are: HEALTH 1 FLAMMABILITY 0 INSTABILITY 1

HMIS Ratings for this product are: HEALTH 1 FLAMMABILITY 0 REACTIVITY 1

6. Accidental Release Measures

Personal precautions: Wear appropriate protective equipment. Wet product and aqueous solutions of product are very slippery. Trace amounts of product on smooth surfaces can become extremely slippery when wet.

Environmental Precautions: Prevent entry of concentrated solutions into sewers or streams, dike if needed.

Procedure for Clean-up: Sweep or scoop dry material and place in appropriate container. Absorb aqueous solutions with a dry inert material, such as clay, and place in an appropriate waste disposal container. After most of the material has been cleaned-up clean the area with warm, soapy water.

7. Handling and Storage

Handling: For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment.

Storage: Store in a cool, dry area. Store in accordance with good industrial practices. Keep away from direct sunlight. Protect against physical damage.

8. Exposure Controls / Personal Protection

Personal Protection

Respiratory: A respirator should not be required when working with Clearflow Gel Block Flocculant 494.
Hands: Use gloves appropriate for work or task being performed. Recommended: PVC, vinyl, or rubber.
Eyes: Safety eyewear should be used when there is a likelihood of exposure. Recommended: Chemical goggles; also wear a face shield if splashing hazard exists.
Skin: Skin Contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Other Personal

Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Engineering Controls: Local exhaust ventilation as required.

9. Physical and Chemical Properties

Physical State: Solid

Color: White or off-white

Odor: Slight vinegar odor

pH: 6.5-7 (concentration dependant)

Specific Gravity: ~1.1

Boiling/Condensing Point: Not available.

Melting/Freezing Point: Not available.

Vapour Pressure: Not available.

Vapour Density: Not available.

% Volatile by Volume: Not available.

Evaporation Rate: Not available.

Solubility: Completely soluble but dissolves very slowly.

VOCs: Not available.

Viscosity: Concentration dependant.

Molecular Weight: Not available.

Other: None

**Check with your site manager that you have
consent to use flocculant on site**

10. Stability and Reactivity	
Chemical Stability:	The product is stable.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures.
Materials to Avoid:	Strong bases such as sodium hydroxide may cause the release of ammonia.
Hazardous Decomposition Products:	At high temperatures carbon oxides and nitrogen oxides may be released upon decomposition.
Additional Information:	No additional information.

11. Toxicological Information

Principle Routes of Exposure

Ingestion:	May cause irritation of the lining of the stomach.
Skin contact:	Mild to moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness.
Inhalation:	Inhalation of vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.
Eye Contact:	May causes eye irritation. May result in mild to moderate irritation to eyes.

Additional Information: Prolonged and repeated contact with the skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis.

Acute Toxicity

Acute Oral LD50:	Oral LD50 (Rat) > 5000 mg/kg
Acute Dermal LD50:	Not available.
Acute Inhalation LC50:	Not available.

Carcinogenicity

2-Propenamide is a suspected human carcinogen, but is present at <0.05% (drinking water additive standard).

Carcinogenicity Comment: No additional information available.

Reproductive Toxicity / Teratogenicity / Embryotoxicity / Mutagenicity: Not available.

12. Ecological Information

Aquatic Ecotoxicity

Ingredient	Species	Test	Result
Whole product	Rainbow Trout (<i>Oncorhynchus mykiss</i>)	96hr LC50 Survival (OECD 203)	210.2 mg/L
	<i>Daphnia magna</i>	48hr EC50 Immobilisation (OECD 202)	418.4 mg/L

Other Information:

Bioaccumulation:	The product is not expected to bioaccumulate.
Persistence / Degradability:	Complete mineralization is expected under environmental exposure. Degradation initialization and rate are UV dependent.

13. Disposal Considerations

Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.

Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

14. Transport Information

Regulatory Information	UN Number	Proper Shipping Name	Hazard Class	PG*	Label	Additional Information
DOT (U.S.)	-	-	-	-	-	not a regulated product
TDG (Canada)	-	-	-	-	-	not a regulated product

PG* : Packaging Group

15. Regulatory Information

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

16. Other Information

Additional Information: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the SDS contains all the information required by the CPR.

Prepared By: Clearflow Group, Inc.

Date of Issue: 1/05/2021

Change List:
original – 10/24/2011
Company name, minor formatting, review of data – 03/21/2016
data review – 04/10/2018
convert to SDS – 04/04/2019
Logo update, data review, product name update – 1/05/2021

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Clearflow expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this SDS as a product specification. For product specification information, refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from Clearflow Group.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Clearflow makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Clearflow's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

END OF SDS

APPENDIX C

STORM DRAIN ENGINEERING DRAWINGS



- GENERAL NOTES**
- To Not Scale
 - The contractor is to check and verify all buildings and site dimensions and levels, including sewer invert levels, before works start on site. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
 - Positions of existing services/utility undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work
 - This drawing is to be read in conjunction with and checked against all other drawings, Engineering Details, Specification and any structural, geotechnical or other specialist document provided.
 - Any anomaly or contradiction between any of the above is to be reported to Taylor Wimpey.
 - This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.

- ROAD AND SEWER ADOPTION NOTES**
- All works for adoption under a Section 106 Agreement shall be carried out to the approval of the Cardiff City Council.
 - All works for adoption under a Section 106 Agreement shall be carried out to the National Water Council guide 'Sewers for Adoption' 7th Edition and Der Cymru Welsh Water's requirements.
 - Streetlighting positions to be pegged on site and agreed by the Local Authority PRIOR to erection commencing.

- DRAINAGE NOTES**
- All private drainage shall be in accordance with BS5831 and relevant sections of Approved Document H of the Building Regulations.
 - The contractor is to check the level of existing sewers being used as outfalls or crossing proposed drainage runs PRIOR to laying any pipes. Any discrepancies are to be reported to the Engineer.
 - Private house drainage will be flexible jointed plastic or clay pipework. Diameter 100mm unless shown otherwise.
 - All connections for House Drainage shall be 100mm unless noted otherwise and must extend 500mm behind the back of footpath/homeowner road. All connections where laid shall be plugged, protected as necessary and marked with a stake for future use. All drainage islands from the adoptable drainage system to be 150mm dia. unless connecting to the head of a 100mm dia. FWS.
 - For private drains where cover to pipes is less than 600mm in vehicular areas or 800mm in other areas protection in the form of a 100mm thick concrete pad shall be provided over the pipe granular surround.
 - Where pipes pass through screen walls, footings or retaining walls inlets are to be provided over. Under buildings pipes shall be surrounded with 150mm thickness of granular material. Where drains pass within 1m of building the wall foundation shall be taken down below the invert of the pipe.
 - Where drains do not exceed 100mm deep, plastic or clay access fittings minimum diameter 225mm shall be used. Elsewhere proprietary plastic or precast concrete inspection chambers shall be used. Unless shown otherwise FW inspection chambers are to be 600mm below doc level and SW chambers and rodding eyes to be 450mm below doc.
 - All gutters and rainwater downpipes connected directly to drains are to be roddable.
 - House levels shown are dpc and adjacent garage floors are to be 100mm lower unless shown otherwise. Levels at drainage access points are inverts.
 - Where possible, drainage runs should be laid at a minimum of 3.0m from the rear of properties where practical to allow for future extensions.
 - All drainage shall be laid upstream and each run between manholes shall be laid complete prior to backfilling. Where this is not practical trial holes or other means of identifying the line and level of services shall be carried out prior to works commencing.
 - All branch drains, or connections, are to discharge to the collectors obliquely, and in the direction of the main flow.
 - All low points on handstanding areas to have yard gullies/ACO.
 - Approved Der Cymru Welsh Water Plastic Pipe Systems are as follows:
 - Marley Twinwall System
 - Upper Ultratix System
 - Cornu Ultratix System
 - Polysewer - Ringsewer (400mm-600mm and 750mm-900mm)

Please note that the installer must be accredited with The British Plastics Federation (BPF).

- LEGEND**
- Existing Sewer
 - Existing Sewer to be diverted
 - Foul Sewer & Manhole (S185)
 - Surface Water Sewer & Manhole (S185)
 - Foul Sewer & Manhole (S104)
 - Surface Water Sewer & Manhole (S104)
 - Road Gully
 - F.F.L. Level
 - Proposed spot level
 - Underbuild
 - Tanking
 - Retaining Wall
 - Block Paving Strip (2m Wide)
 - Rumble Strip (600mm Wide)
 - Block paved construction, Block colour 'Red Brindle' Shared Surfaces Areas
 - Street Lighting - Refer to Capital's drawings - GC3805-CAP-79-XX-DH-E-1301_1302 POT

LOCATION OF SVP AND RWP TO BE CONFIRMED

E	16.12.20	Bin-store omitted from Crescent.	SD	TL
D	16.10.20	S185 Drainage amended, Dwg updated to suit	TL	SD
C	12.10.20	Drainage updated to suit layout	SD	TL
B	23.09.20	Drainage layout revised to suit updated layout and tree protection zones. DWG updated.	TL	SD
A	19.02.20	Dwg updated	TL	SD
REV.	DATE	DETAILS	BY	CHK.

CLIENT: **Taylor Wimpey**

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PROJECT: **Taylor Wimpey BBC Llandaff**

DRAWING TITLE: **Engineering Layout**

DRAWN	CORR	STATUS	SCALE
TL	SJD	Tender	1:500 @ A0
DATE	JOB NO	DWG NO	REV
Sept'19	1888	101	E