

Havant Thicket Reservoir Project

Environmental Statement Volume 4 - Appendices **Revised** Appendix A10.7 Ground Conditions **Impact Assessment Tables**

Portsmouth Water Ltd.

21/05/24

Atkins Doc No.: HTR-ATK-ZZ-ZZ-RP-Z-0155

Atkins Revision No.: C01

Notice

This document and its contents have been prepared and are intended as planning information for Portsmouth Water Limited and use in relation to the Havant Thicket Reservoir.

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Document history

PW Revision	Status	Purpose description	Originated	Checked	Reviewed	Authorised	Date
C01	A1	Revised ES Submission	MT	LR	AR	JF	21/05/24
P01	S0	Final	CH	EG	SJ	LJB	21/08/20

Client signoff

Client	Portsmouth Water Ltd.
Project	Havant Thicket Reservoir Project
Job number	5169117
Client signature / date	

This appendix forms part of a revision to the original Havant Thicket Reservoir Environmental Statement (ES) which accompanied the Havant Thicket Reservoir hybrid planning application and outline planning application for the associated pipeline, between the reservoir and Bedhampton springs and pumping station, approved on 15th October 2021 (Approved Scheme).

A new pipeline route and design have been identified, which needs a new planning approval. A new full planning application has been prepared for this revised pipeline route supported by this revision to the original ES (2020 ES).

To make it easier for the reader, this appendix still includes supporting assessment information of the reservoir but also includes the new or updated supporting information for the pipeline. The changes from the original appendix are shown in green text.

Appendix A10.7 Impact assessment tables

Table 1 - Reservoir site (including access roads) – construction phase impact assessment

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Construction with Mitigation Risk Category	Classification of Effect
ON-SITE: Re-worked site won material used during the construction of the Upper Lake, Upper Lake Weir, Boat House and the George Canning Monument. Re-worked site material used during the channelization of unnamed watercourses. Potentially contaminated natural superficial strata from localised spills / leaks during past mechanical de-vegetation. Potentially contaminated natural superficial strata from localised spills / leaks from previously observed dumped and burnt out cars or motorbike use. Made Ground associated with the construction and operation of the B2149, Swanmore Road and Calshot Road. Infilled ground associated with two former clay pits located within the northwest and north of the Site and a former chalk pit located within the north west of the Site. Infilled ground associated with a former brickworks and clay pits located within the northeast of the Site. Potential spills / leaks during construction and operation of the reservoir and access roads. <i>A range of inorganic and organic contaminants including metals, Polycyclic Aromatic Hydrocarbons (PAHs), hydrocarbons and potential for asbestos. Fuels and oils attributed to spills from vehicles. Potential for ground gas generation including carbon dioxide and methane from infilled ground / Made Ground.</i>	Human health: On-site	Current members of the public using footpaths and public rights of way	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water.	Very low risk	Receptor not present	Negligible ¹
		Current road users	Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	Very low risk	Very low risk	Negligible
		Future on-site users: reservoir operatives		Receptor not present	Receptor not present	Negligible
		Future on-site users: members of the public visiting the reservoir		Receptor not present	Receptor not present	Negligible
	Human health: Off-site	Workers and residents in surrounding commercial and residential areas.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site. Inhalation of contaminants in soil, soil-derived dust, fibres and gas/vapours which may have migrated off-site.	Very low risk	Very low risk	Negligible
		Visitors using the surrounding footpaths and parks.		Very low risk	Very low risk	Negligible
	Controlled Waters: groundwater	Groundwater in the superficial Undifferentiated aquifer and bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
	Controlled Waters: surface water	On-site: the proposed reservoir, Hermitage Stream, unnamed watercourses, drains and the Upper Lake.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Low risk	Very low risk	Minor beneficial
		Off-site: drains, ponds and the lake within the study area.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Low risk	Very low risk	Minor beneficial
	Property / services	Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Receptor not present	Very low risk	Negligible ²

¹ Removal of this receptor at construction automatically triggers a minor beneficial effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

² Introduction of this receptor at construction automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Construction with Mitigation Risk Category	Classification of Effect
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present	Very low risk	Negligible ²
		Existing off-site services and structures within study area including listed buildings.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk	Very low risk	Negligible
	Ecological	On-site: South Downs National Park, Ancient Woodland and Sites of Importance for Nature Conservation (SINCs).	Migration of contaminated waters/dust/fibres and subsequent uptake by flora or ingestion/ inhalation/dermal contact by fauna.	Very low risk	Very low risk	Negligible
		Off-site: South Downs National Park, Ancient Woodland and SINCs		Very low risk	Very low risk	Negligible
OFF-SITE: Fuel station 84m east of the Site. Made Ground of unknown provenance used for the infilling of surrounding brick and clay pits located between 50m and 400m to the south east of the Site as well as potentially contaminated ground associated with the operation of the pits, brickfields and associated brickworks. Made Ground and potentially contaminated groundwater associated with Dunsbury Hill Farm historical landfill is located adjacent to the northwest of the Site and Padnell historical landfill located 327m west of the Site. Made Ground of unknown provenance used in construction of housing estates to the east, south and southwest of the Site. Made Ground and potentially contaminated ground associated with the former Leigh Park Estate battery located 60m south of the Site and military base located 350m south of the Site. Former allotments located 250m southeast of the Site Former smithy located 260m south east of the Site.	Human health: On-site	Current members of the public using footpaths and public rights of way.	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water. Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	Very low risk	Very low risk	Negligible
		Current road users		Very low risk	Very low risk	Negligible
		Future on-site users: reservoir operatives		Receptor not present	Receptor not present	Negligible
		Future on-site users: members of the public visiting the reservoir		Receptor not present	Receptor not present	Negligible
	Controlled waters: groundwater	On-site: groundwater in the superficial Undifferentiated aquifer and bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
	Controlled waters: surface water	On-site: the proposed reservoir, Hermitage Stream, unnamed watercourses, drains and the Upper Lake.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Low risk	Very low risk	Minor beneficial
	Property / services	Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Receptor not present	Very low risk	Negligible ³

³ Introduction of this receptor at construction automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Construction with Mitigation Risk Category	Classification of Effect
Made Ground and localised vehicle spills/leaks associated with a motor racing circuit located 400m north. <i>A range of inorganic and organic contaminants including metals, hydrocarbons, asbestos. Fuels and oils attributed to spills from vehicles. Ground gas generation including carbon dioxide and methane from infilled ground / Made Ground and landfills. Pesticides and herbicides attributed to former allotments.</i>	Ecological	On-site: South Downs National Park, Ancient Woodland and SINCs.	Migration of contaminated waters/dust/fibres and subsequent uptake by flora or ingestion/ inhalation/dermal contact by fauna.	Very low risk	Very low risk	Negligible

Table 2 - Reservoir site (and access roads) – operation phase impact assessment

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Operation with Mitigation Risk Category	Classification of Effect
ON-SITE: Re-worked site won material used during the construction of the Upper Lake, Upper Lake Weir, Boat House and the George Canning Monument. Re-worked site material used during the channelization of unnamed watercourses. Potentially contaminated natural superficial strata from localised spills / leaks during past mechanical de-vegetation. Potentially contaminated natural superficial strata from localised spills / leaks from previously observed dumped and burnt out cars or motorbike use. Made Ground associated with the construction and operation of the B2149, Swanmore Road and Calshot Road. Infilled ground associated with two former clay pits located within the northwest and north of the Site and a former chalk pit located within the north west of the Site. Infilled ground associated with a former brickworks and clay pits located within the northeast of the Site. Potential spills / leaks during construction and operation of the reservoir and access roads. <i>A range of inorganic and organic contaminants including metals, Polyaromatic Hydrocarbons (PAHs), hydrocarbons and potential for asbestos. Fuels and oils attributed to spills from vehicles. Potential for ground gas generation including carbon dioxide and methane from infilled ground / Made Ground.</i>	Human health: On-site	Current members of the public using footpaths and public rights of way	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water.	Very low risk	Very low risk	Negligible
		Current road users	Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	Very low risk	Very low risk	Negligible
		Future on-site users: reservoir operatives		Receptor not present	Low risk	Negligible ⁴
		Future on-site users: members of the public visiting the reservoir		Receptor not present	Very low risk	Negligible ⁴
	Human health: Off-site	Workers and residents in surrounding commercial and residential areas.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site. Inhalation of contaminants in soil, soil-derived dust, fibres and gas/vapours which may have migrated off-site.	Very low risk	Very low risk	Negligible
		Visitors using the surrounding footpaths and parks.		Very low risk	Very low risk	Negligible
	Controlled Waters: groundwater	Groundwater in the superficial Undifferentiated aquifer and bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
	Controlled Waters: surface water	On-site: the proposed reservoir, Hermitage Stream, unnamed watercourses, drains and the Upper Lake.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Low risk	Very low risk	Minor beneficial
		Off-site: drains, ponds and the lake within the study area.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Low risk	Very low risk	Minor beneficial
	Property / services	Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Receptor not present	Very low risk	Negligible ⁵

⁴ Introduction of this receptor at operation automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

⁵ Introduction of this receptor at operation automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Operation with Mitigation Risk Category	Classification of Effect
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present	Very low risk	Negligible ⁵
		Existing off-site services and structures within study area including listed buildings.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very lLow risk	Very low risk	Negligible
	Ecological	On-site: South Downs National Park, Ancient Woodland and Sites of Importance for Nature Conservation (SINCs).	Migration of contaminated waters/dust/fibres and subsequent uptake by flora or ingestion/ inhalation/dermal contact by fauna.	Very low risk	Very low risk	Negligible
		Off-site: South Downs National Park, Ancient Woodland and SINCs		Very low risk	Very low risk	Negligible
OFF-SITE: Fuel station 84m east of the Site. Made Ground of unknown provenance used for the infilling of surrounding brick and clay pits located between 50m and 400m to the south east of the Site as well as potentially contaminated ground associated with the operation of the pits, brickfields and associated brickworks. Made Ground and potentially contaminated groundwater associated with Dunsbury Hill Farm historical landfill is located adjacent to the northwest of the Site and Padnell historical landfill located 327m west of the Site. Made Ground of unknown provenance used in construction of housing estates to the east, south and southwest of the Site. Made Ground and potentially contaminated ground associated with the former Leigh Park Estate battery located 60m south of the Site and military base located 350m south of the Site. Former allotments located 250m southeast of the Site	Human health: On-site	Current members of the public using footpaths and public rights of way.	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water. Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	Very low risk	Very low risk	Negligible
		Current road users		Very low risk	Very low risk	Negligible
		Future on-site users: reservoir operatives		Receptor not present	Low risk	Negligible ⁵
		Future on-site users: members of the public visiting the reservoir		Receptor not present	Very low risk	Negligible ⁵
	Controlled waters: groundwater	On-site: groundwater in the superficial Undifferentiated aquifer and bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Low risk	Very low risk	Minor beneficial
	Controlled waters: surface water	On-site: the proposed reservoir, Hermitage Stream, unnamed watercourses, drains and the Upper Lake.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Low risk	Very low risk	Minor beneficial
	Property / services	Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Receptor not present	Very low risk	Negligible ⁶

⁶ Introduction of this receptor at operation automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Operation with Mitigation Risk Category	Classification of Effect
Former smithy located 260m south east of the Site. Made Ground and localised vehicle spills/leaks associated with a motor racing circuit located 400m north. <i>A range of inorganic and organic contaminants including metals, hydrocarbons, asbestos. Fuels and oils attributed to spills from vehicles. Ground gas generation including carbon dioxide and methane from infilled ground / Made Ground and landfills. Pesticides and herbicides attributed to former allotments.</i>	Ecological	On-site: South Downs National Park, Ancient Woodland and SINCs.	Migration of contaminated waters/dust/fibres and subsequent uptake by flora or ingestion/ inhalation/dermal contact by fauna.	Very low risk	Very low risk	Negligible

Table 3 - Pipeline corridor – construction phase impact assessment table

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Construction with Mitigation Risk Category	Classification of Effect
ON-SITE: Made Ground associated with the construction and operation of roads including Hooks Farm Way and North Street. Made Ground associated with the construction of former residential properties within Bedhampton and Havant. Made Ground associated with the Southern Railway crossing the Site. Portsmouth Water Works licenced waste management facilities – Bedhampton landfill in the south of the site. Potential spills / leaks during construction and operation of the pipeline. Made Ground associated with construction and operation of the Dunsbury Way Industrial Estate on the former sewage works site. Former sewage disposal works located adjacent to the north. <i>A range of inorganic and organic contaminants including metals, hydrocarbons, asbestos and biological contaminants. Fuels and oils attributed to spills from vehicles. Ground gas generation including carbon dioxide and methane from infilled ground / Made Ground and landfills.</i>	Human health: On-site	Current road users	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water.	Very low risk	Receptor not present	Negligible ⁷
		Pedestrians accessing existing roads, footpaths and public rights of way.	Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours	Low risk	Receptor not present	Negligible ⁷
		Workers and residents in on-site commercial and residential areas.		Very low risk	Receptor not present	Negligible ⁷
		Future on-site users: road users, pedestrians, workers and residents		Receptor not present	Receptor not present	Negligible
	Human health: Off-site	Workers and residents in surrounding commercial and residential areas.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site. Inhalation of contaminants in soil, soil-derived dust, fibres and gas/vapours which may have migrated off-site.	Very low risk	Very low risk	Negligible
		Pedestrians using the surrounding footpaths, roads and parks.		Low risk	Very low risk	Minor beneficial
	Controlled Waters: groundwater	Groundwater in the superficial Undifferentiated aquifer, superficial Secondary A aquifers and the bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
	Controlled Waters: surface water	On-site: Hermitage Stream and Riders Lane Stream.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Moderate/low risk	Moderate/low risk	Negligible
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Moderate/low risk	Moderate/low risk	Negligible

⁷ Removal of this receptor at construction automatically triggers a minor beneficial effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Construction with Mitigation Risk Category	Classification of Effect
		Off-site: the Hermitage Stream, Riders Lane Stream, two unnamed streams (approximately 650m and 710m north west)	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Moderate/low risk	Moderate/low risk	Negligible
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Moderate/low risk	Moderate/low risk	Negligible
	Property / services	Existing on-site services and below ground structures	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk	Very low risk	Negligible
		Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Receptor not present	Very low risk	Negligible ⁸
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present	Very low risk	Negligible ⁸
		Existing services and structures within the study area including listed buildings.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk	Very low risk	Negligible
OFF-SITE: Made Ground of unknown provenance used in construction of housing estates and commercial properties associated with the development of Bedhampton and Havant. Made Ground associated with the construction and operation of adjacent roads.	Human health: On-site	Current road users	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water. Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	Very low risk	Receptor not present	Negligible ⁹
		Pedestrians accessing existing roads, footpaths and public rights of way		Very low risk	Receptor not present	Negligible ⁹
		Workers and residents in on-site commercial and residential areas.		Very low risk	Recetor not present	Negligible ⁹
		Future on-site users: road users, pedestrians, workers and residents		Receptor not present	Receptor not present	Negligible

⁸ Introduction of this receptor at construction automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

⁹ Removal of this receptor at construction automatically triggers a minor beneficial effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Construction with Mitigation Risk Category	Classification of Effect
Made Ground of unknown provenance used for the infilling of surrounding sand and clay pits located between 250m west and 380m to the north west of the Site as well as potentially contaminated ground associated with the operation of the pits, brickfields and associated brickworks and tile works. Former mills (including Bedhampton Mill and Upper Mill) located within the study area. Former tannery located 300m south east. Portsmouth water works located 420m south east, former pumping station located 60m south west and former water works located 180m south west. Former pumping station located 160m southwest. Former sewage disposal works located 10m north. Former works/factory buildings 80m north and 180m north. Former and active garages and petrol stations located between 40m west and 474m east of the Site. Industrial estate located approximately 250m south. Former allotment gardens within the study area. <i>A range of inorganic and organic contaminants including metals, hydrocarbons, asbestos. Fuels and oils attributed to spills from vehicles. Ground gas generation including carbon dioxide and methane from infilled ground / Made Ground and landfills. Pesticides and herbicides attributed to former allotments.</i>	Controlled waters: groundwater	Groundwater in the superficial Undifferentiated aquifer, superficial Secondary A aquifers and the bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
	Controlled waters: surface water	On-site: Hermitage Stream and Riders Lane Stream.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Moderate/Low risk	Low risk	Negligible
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Moderate/Low risk	Low risk	Negligible
	Property / services	Existing services and structures on-site	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
		Future below ground on-site services and structures		Receptor not present	Receptor not present	Negligible

Table 4 - Pipeline corridor – operation phase impact assessment table

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Operation with Mitigation Risk Category	Classification of Effect
ON-SITE: Made Ground associated with the construction and operation of roads including Hooks Farm Way and North Street. Made Ground associated with the construction of former residential properties within Bedhampton and Havant. Made Ground associated with the Southern Railway crossing the Site. Portsmouth Water Works licenced waste management facilities – Bedhampton landfill in the south of the site. Potential spills / leaks during construction and operation of the pipeline. Made Ground associated with construction and operation of the Dunsbury Way Industrial Estate on the former sewage works site. Former sewage disposal works located adjacent to the north. <i>A range of inorganic and organic contaminants including metals, hydrocarbons, asbestos and biological contaminants. Fuels and oils attributed to spills from vehicles. Ground gas generation including carbon dioxide and methane from infilled ground / Made Ground and landfills.</i>	Human health: On-site	Current road users	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water. Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	Very low risk	Very low risk	Negligible
		Pedestrians accessing existing roads, footpaths and public rights of way.		Low risk	Very low risk	Minor beneficial
		Workers and residents in on-site commercial and residential areas.		Very low risk	Very low risk	Negligible
		Future on-site users: road users, pedestrians, workers and residents		Receptor not present	Very low risk	Negligible
	Human health: Off-site	Workers and residents in surrounding commercial and residential areas.	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water which may have migrated off-site. Inhalation of contaminants in soil, soil-derived dust, fibres and gas/vapours which may have migrated off-site.	Very low risk	Very low risk	Negligible
		Pedestrians using the surrounding footpaths, roads and parks.		Low risk	Very low risk	Minor beneficial
	Controlled Waters: groundwater	Groundwater in the superficial Undifferentiated aquifer, superficial Secondary A aquifers and the bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
	Controlled Waters: surface water	On-site: Hermitage Stream and Riders Lane Stream.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Moderate/low risk	Low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Moderate/low risk	Low risk	Minor beneficial

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Operation with Mitigation Risk Category	Classification of Effect
		Off-site: the Hermitage Stream, Riders Lane Stream, two unnamed streams (approximately 292m and 330m	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Moderate/low risk	Low risk	Minor beneficial
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Moderate/low risk	Low risk	Minor beneficial
	Property / services	Existing on-site services and below ground structures	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk	Very low risk	Negligible
		Future on-site services and structures.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Receptor not present	Very low risk	Negligible ¹⁰
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Receptor not present	Very low risk	Negligible ¹⁰
		Existing services and structures within the study area including listed buildings.	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Very low risk	Very low risk	Negligible
OFF-SITE: Made Ground of unknown provenance used in construction of housing estates and commercial properties associated with the development of Bedhampton and Havant. Made Ground associated with the construction and operation of adjacent roads. Made Ground of unknown provenance used for the infilling of surrounding sand	Human health: On-site	Current road users	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water. Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	Very low risk	Very low risk	Negligible
		Pedestrians accessing existing roads, footpaths and public rights of way		Very low risk	Very low risk	Negligible
		Workers and residents in on-site commercial and residential areas.		Very low risk	Very low risk	Negligible
		Future on-site users: road users, pedestrians, workers and residents		Receptor not present	Very low risk	Negligible
	Controlled waters: groundwater	Groundwater in the superficial Undifferentiated aquifer, superficial Secondary A aquifers and the bedrock Secondary A aquifers.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial

¹⁰ Introduction of this receptor at operation automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Operation with Mitigation Risk Category	Classification of Effect
and clay pits located between 250m west and 380m to the north west of the Site as well as potentially contaminated ground associated with the operation of the pits, brickfields and associated brickworks and tile works. Former mills (including Bedhampton Mill and Upper Mill) located within the study area. Former tannery located 300m south east. Portsmouth water works located 420m south east, former pumping station located 60m south west and former water works located 180m south west. Former pumping station located 160m southwest. Former sewage disposal works located 10m north. Former works/factory buildings 80m north and 180m north. Former and active garages and petrol stations located between 40m west and 474m east of the Site. Industrial estate located approximately 250m south. Former allotment gardens within the study area. <i>A range of inorganic and organic contaminants including metals, hydrocarbons, asbestos. Fuels and oils attributed to spills from vehicles. Ground gas generation including carbon dioxide and methane from infilled ground / Made Ground and landfills. Pesticides and herbicides attributed to former allotments..</i>			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
		Groundwater in the Chalk Principal aquifer.	Leaching/migration of contaminants in soil to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
			Migration of contaminated water through preferential pathways such as underground services, pipes and granular material to groundwater in underlying aquifers.	Moderate/low risk	Low risk	Minor beneficial
	Controlled waters: surface water	On-site: Hermitage Stream and Riders Lane Stream.	Migration of contaminated groundwater along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Low risk	Negligible
			Discharge of contaminants entrained in groundwater and, or surface water run-off followed by overland flow and discharge.	Low risk	Low risk	Negligible
	Property / services	Existing services and structures on-site	Direct contact of contaminants in soil and/or groundwater with existing and proposed structures and buried services.	Very low risk	Very low risk	Negligible
		Future below ground on-site services and structures		Receptor not present	Very low risk	Negligible ¹¹

¹¹ Introduction of this receptor at operation automatically triggers a minor adverse effect. However, professional judgement has been exercised and this effect has been reduced to negligible.



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