

Havant Thicket Reservoir Project

Environmental Statement Volume 4 - Appendices

Appendix A10 Ground Conditions

A10.7 Impact Assessment Tables

Portsmouth Water Ltd.

21/08/20

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Notice

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Document history

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Client signoff

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

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, 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	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. Made Ground and localised vehicle spills/leaks associated with a motor racing circuit located 400m north.	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
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
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

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
<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>						

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 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. Made Ground and localised vehicle spills/leaks associated with a motor racing circuit located 400m north.	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
	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

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
<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>						

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 Botley Drive, Highclere Avenue, Dunsbury Way, Ellisfield Road, Purbrook Way, High Lawn Way and Brunswick Gardens, Bedhampton Road 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. Infilled ground associated with a former pond located partly on-site. Portsmouth Water Works licenced waste management facilities – Bedhampton landfill. Potential spills / leaks during construction and operation of the pipeline. <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.</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	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
			Migration of contaminated groundwater along strata and preferential pathways such as	Moderate/low risk	Low risk	Minor beneficial

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 292m and 330m)	service routes or differentially permeable strata.			
			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.	Low risk	Very low risk	Minor beneficia
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
		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. Made Ground of unknown provenance used for the infilling of surrounding sand and clay pits located between 50m west and 380m to the north west of the Site as well as potentially contaminated ground	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
	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

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
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 500m south east. Portsmouth water works located 10m south and 420m south east, former pumping station located 160m south west and former water works located 180m south west. Former pumping station located 160m southwest. Former sewage disposal works located 70m 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 ¹⁰

¹⁰ 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.

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 Botley Drive, Highclere Avenue, Dunsbury Way, Ellisfield Road, Purbrook Way, High Lawn Way and Brunswick Gardens, Bedhampton Road 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. Infilled ground associated with a former pond located partly on-site. Portsmouth Water Works licenced waste management facilities – Bedhampton landfill. Potential spills / leaks during construction and operation of the pipeline. <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.</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
			Migration of contaminated groundwater along strata and preferential pathways such as	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	service routes or differentially permeable strata.			
			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.	Low risk	Very low risk	Minor beneficial
			Migration of contaminated groundwater, ground gas and/or vapours along strata and preferential pathways such as service routes or differentially permeable strata.	Low risk	Very low risk	Minor beneficial
		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 ¹¹
			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 ¹¹
		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 and clay pits located between 50m west and 380m to the north west of the Site as well as potentially contaminated ground	Human health: On-site	Current road users	Dermal contact with and ingestion of contaminants in soils, soil-derived dusts and water.	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.	Inhalation of contaminants in soil, soil-derived dust, fibres, gas and vapours.	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
			Migration of contaminated water through preferential pathways such as underground services,	Moderate/low risk	Low risk	Minor beneficial

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.

Source	Receptor		Contaminant exposure / migration pathway	Baseline Risk Category	Operation with Mitigation Risk Category	Classification of Effect
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 500m south east. Portsmouth water works located 10m south and 420m south east, former pumping station located 160m south west and former water works located 180m south west. Former pumping station located 160m southwest. Former sewage disposal works located 70m 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>			pipes and granular material to groundwater in underlying aquifers.			
		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 ¹²

¹² 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.

Atkins
The Hub
500 Park Avenue
Aztec West
Bristol
BS32 4RZ

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