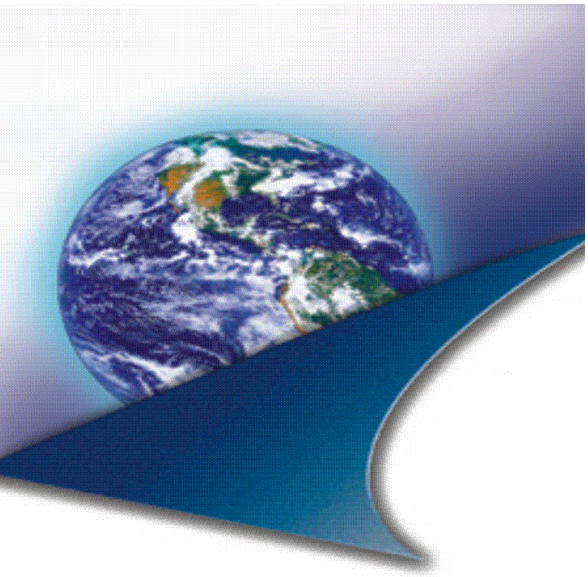

Knight Piésold
CONSULTING

SPOIL DISPOSAL MANAGEMENT PLAN

ANNEXURE A

CONSTRUCTION:

THE NORTHERN AQUEDUCT AUGMENTATION

PHASE 4 PROJECT, KWAZULU-NATAL

EIA Ref Number: **DM/0065/2012**

Date: **May 2013**

On Behalf of: **EThekwini Water & Sanitation**

ETHEKWINI MUNICIPALITY

Prepared by:

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CONTENTS

i. KEY TO ABBREVIATIONS & ACRONYMS

ASDS	Ancillary Spoil Disposal Sites
CP	Communications Plan
DAEARD	Department of Agriculture, Environmental Affairs and Rural Development
DMR	Department of Mineral Resources
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Plan
ER	Engineers Representative
EWS	EThekwini (Municipality) Water and Sanitation
HMP	Heritage Resource Management Plan
KP	Knight Piésold Consulting (in reference to the Environmental Consultants)
KZN	KwaZulu-Natal
MPRDA	Mineral and Petroleum Resource Development Act (No. 28 of 2002)
RoD	Record of Decision (authorisation document from the DAEARD)
RRP	Plant Rescue and Rehabilitation Plan
SDMP	Spoil Disposal Management Plan
NAA	Northern Aqueduct Augmentation (with reference to the EThekwini Municipality pipeline)

ii. GLOSSARY OF TERMS & ABBREVIATIONS

a. Parties Involved

All staff: The entire workforce and project team appointed by the Developer to implement the project. Sub-contractors, service or product providers / suppliers, artisans and workers employed by the Contractor, Consulting Engineers or Environmental Consultants, and persons visiting or making deliveries to the site.

Engineer: Engineers responsible for engineering design and/or implementation of the project.

Contractor: For the purposes of this document, the term 'Contractor' refers to the main contractor(s) appointed to undertake the construction of the project, or portion of the construction of the project. The Contractor(s) are required to adhere to the Environmental Management Plan (EMP) and are responsible for ensuring that all sub-contractors, suppliers and staff appointed by them also adhere to the conditions of the EMP.

DAEARD: Refer 'Abbreviations / Acronyms' above. For the purposes of this document, 'DAEARD' refers to representatives of the KZN Department of Agriculture, Environmental Affairs and Rural Development, the provincial decision making authority in terms of environmental issues and associated applications under NEMA (National Environmental Management Act No. 107 of 1998).

Developer (or Proponent): The client (an individual or group), whom is responsible for the planning, funding and development of the project. In this case, eThekwini Municipality Water and Sanitation.

Engineer's Representative (ER): For the purposes of this document, the 'ER' refers to the individual appointed by the Engineers to oversee the implementation of the construction phase of the project, including the rescue and rehabilitation phases.

Environmental Consultant: The individual or company responsible for the development of the Environmental Management Plan (EMP) which includes the Plant Rescue and Rehabilitation Plan, Communications Plan, Spoil Disposal Management Plan and Heritage Management Plan. The Environmental Consultant can also fulfil a role in the monitoring and auditing of the implementation of the EMP and Rescue and Rehabilitation Plan. For the purposes of this document, the term 'Environmental Consultant' refers to *Knight Piésold* Consulting.

Environmental Control Officer (ECO): For the purposes of this document, the 'ECO' refers to the individual appointed by the Developer to oversee the implementation of the Environmental Management Plan (EMP) on site by the various Contractors (refer above). The ECO is to be qualified in the environmental sciences, understand the detailed environmental issues associated with the development, and is to be well versed in the contents of the EMP and its associated reports. The ECO will be the liaison person between the Environmental Site Officers (ESOs, refer below) of the contracting teams, and the Developer (refer above), the Consulting Engineers (refer above), and the Environmental Consultants (refer above).

Environmental Site Officer (ESO): For the purposes of this document, the ESO is an individual appointed by the Contractor to represent the contracting team, and is to be responsible for ensuring the day-to-day implementation of the EMP on the site by the team in question. The ESO is to be qualified in the environmental sciences, informed of the contents of the Environmental Management Plan (EMP) relevant to the activities of the construction team in question, and is to understand the basic environmental issues associated with the development. The ESO is to report to the ECO (refer above) with regards to any environmental issues.

Interested & Affected Parties (IAPs): Any individual or group of individuals concerned with, interested in, or affected by the project and its consequences, including (but not restricted to) the local community and general public, government and local authorities, stakeholders, landowners, tribal authorities and public interest groups.

Project Manager: The person responsible for coordinating and integrating activities across multiple, functional lines.

b. About the Construction Activities

Active Sites (see also Work Fronts): The active sites are areas of the working corridor of pre-determined lengths where clearing activities, excavations, trench activities, reinstatement activities and rehabilitation activities are taking place. More than one active site may be operative along the route. The active sites are to be temporarily fenced, and all construction and rehabilitation related activities are to remain within the confines of the temporary boundary, and are to make use of access routes as determined for each active site. The active sites are also referred to as the Working Fronts (see below).

Builders rubble: Any material (for example: wooden planks, waste concrete, cardboard, used bricks, unused subsoil, and metal scraps) utilised in the construction activities, or resulting from the demolition of existing structures on site, that will not serve a purpose in the final structural support, and will require removal from site prior to project hand-over.

Construction camp / site office: The areas / containers utilised for on-site staff offices (for engineers and contractors etc.) as well as to store materials, plant, equipment and ablution facilities (the location of which as agreed to by the developer and environmental consultants). In this document construction site office / camp / containers will be used interchangeably, but '*site office*' will be the preferred nomenclature. There will be one site office per sector. At these offices administrative duties will be performed. There will be construction camps at different locations at which fabrication activities will be performed.

Construction site: The working corridor (see below) and associated construction camp (see above), stockpile areas, pipe-yards, pipe fabrication yards and storage facilities, and site access roads. The working corridor includes a maximum area of 30m wide by 350m long, but may be less than this in certain sensitive areas. The construction site is to be demarcated and signposted by the Contractor. All construction activities are to remain within the confines of the working corridor, construction camp and pipe-yards. The terminology utilised in the contract documents is 'working front', 'Contractor's camp site' and 'working corridor'.

Legal action: Financial penalties / fines, time penalties (suspension of work) and other legal action as may be imposed by the DAEARD / DEAT or any other action taken against the contractor or developer responsible for an incident of non-compliance with the EMP or RoD. The legal action will be determined according to the nature of the non-compliance or crime.

***Relevant steps**: Can include but will not be limited to: Site Instruction being issued by the Engineer to rectify, Site Instruction being issued by the Engineer to suspend the Works until rectification of matters, Depending on the severity of the contravention, the raising of fines by the relevant authority (DAEARD)*

Layout plan: A plan indicating the layout of an area of the development. For example, where the term follows the phrase 'site office / camp', it refers to the layout of the office / camp area that is to be used by the Contractor, including all buildings, storage areas and proposed locations of any facilities to be housed in such an area.

Open trench: Refers to the area within the Working Front (see below) where trench excavation and pipe laying activities are occurring. An open trench ceases to be open once backfilling and reinstatement have taken place.

Timeous/ly: At least 7 working days prior to an activity, or after an instruction or request.

Working Corridor: This is the Temporary Working Space (refer below) as agreed to by the affected landowners together with the Registered (or operational) Servitude (refer above). The Working Corridor is the corridor within which work will take place (up to 30m wide) for the entire length of the pipeline. Part of the Working Corridor will constitute the Active sites or the Working Front (see below).

Working Front (see also Active Sites): The working front is the area of the working corridor where work is actively taking place such as clearing activities, excavations, trench activities, reinstatement activities and rehabilitation activities. More than one working front may be operative along the route. The working fronts are to be temporarily fenced, and all construction and rehabilitation related activities are to remain within the confines of the temporary boundary, and are to make use of access routes as determined for each active site. The working front length is split into 3 sections:
-Advance work front - the area which is cleared and grubbed and where proving for services takes place. This section length is limited to 250m to 300m.
-Construction work front - is the area where pipe laying activities take place and is limited to 200m (in built up areas) although it can be longer in agricultural areas (up to 500m) and shorter in restricted areas.
-Reinstatement work front – is the area usually no longer than 200m where reinstatement and rehabilitation takes place and lags behind the construction work front.

(Temporary) Working Space: For the purposes of this document, the temporary working space will refer to the area of working corridor that will be used for construction purposes but is not part of the existing servitude, during the operational phase of the project. For example, the working corridor may be 30m wide in some instances, and will comprise 12m of existing electrical servitude, and 18m of the temporary working space. The working space is temporary, and permission to occupy this land is to be obtained from the relevant landowners prior to construction on their land. This servitude is to be reinstated and rehabilitated after construction.

c. About Environmental & Spoil Management

Environmental audit and monitoring: Structured observation, measurement and evaluation of environmental data over a period of time to assess the efficiency of environmental mitigation and rehabilitation measures. The auditing and monitoring of the site will commence at intervals to be determined by the DAEARD and Environmental Consultant, and will involve a site inspection of the construction activities and the environmental management compliance. A report of the findings at each visit will be compiled and submitted to the Developer and/or DAEARD as necessary.

Environmental incident: An accident or unexpected occurrence related to the Project, including fire, spills, pollution events, explosions, major emissions, flood events, or bank collapse leading to serious or potentially serious negative environmental impacts.

Environmental Incident Report File (EIRF): A file provided at the Site Office for the recording all environmental incidents and including a complaints register for the recording of general public concerns.

Environmental Management Plan (EMP): A detailed plan of action prepared to organise and coordinate environmental mitigation, rehabilitation and monitoring so that positive impacts are enhanced and negative impacts are avoided / minimised. The EMP is a legally binding document and is to be adhered to by 'all staff' (refer above) at all times.

Flagged Resource/s: A 'Flagged Resource' refers specifically to a resource or area identified along the pipeline route by specialists during the environmental investigations. These Flagged Resources require specific care and management.

Hazardous substances: Substances including but not limited to chemicals, solvents, fuels, oils, and lubricants as liquids, solids or gases that are harmful or potentially dangerous to human and / or environmental health. 'Harmful / dangerous' refers to the substances' inherent chemical and physical composition that could be toxic, poisonous, explosive, carcinogenic, flammable or radioactive. Used hazardous substances should be disposed of as 'hazardous waste' if no longer needed.

Invasive Alien (vegetation): an undesirable plant species and / or community which shall include, but not be limited to, all declared Category 1 & 2 listed invader species as set out in regulations pursuant to the Conservation of Agricultural Resources Act No. 43 of 1983 (CARA). Other vegetation deemed to be invasive alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Minimize: For the purposes of this document: to do all that is possible to lessen the impact.

Mitigation: For the purposes of this document: measures of environmental management designed to reduce, avoid or remedy undesirable environmental impacts.

Pollution: Contamination of air, water, soil or environment by a foreign substance or matter.

Rehabilitation: Measures implemented to reinstate an area / site to a status of good environmental health, better than its former status, and striving towards its natural status. Rehabilitation is mainly aimed at post-reinstatement re-vegetation of a disturbed area and ensuring a stable land surface. Re-vegetation should aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment, but discourage alien encroachment.

Spoil: any 'overburden', soil, topsoil, subsoil, rock or the like which is removed / excavated from the trenches for the purposes of installing the pipeline, which is in excess and cannot be later replaced into the trench due to the presence of the pipe, its associated structures and bedding material, and which will require suitable 'disposal' or end use.

***Spoil - Contaminated:** is polluted spoil containing builder's rubble or 'hazardous substances' (see above) and is to be considered as 'general' waste (see below) or 'hazardous' waste (see below) and is therefore to be disposed of in accordance with these classifications.

***Spoil - Uncontaminated:** is potentially useful as fill or overburden, and may therefore be considered for use by third parties in other development projects or activities in accordance with the recommendations of this SDMP.

Spoil Disposal Management Plan (SDMP): A detailed plan of action prepared to organise and coordinate the disposal of spoil in an environmentally conscientious way, providing environmentally sustainable alternatives to typical landfill disposal options for uncontaminated spoil given its usefulness. The SDMP forms part of the EMP which is a legally binding document and is to be adhered to by 'all staff' (refer above) at all times.

Surface vegetation: Will be deemed to be any woody or herbaceous vegetation, but will exclude grasses, sedges, rushes and reeds.

Topsoil: This is defined as the A horizon of the soil profile. Topsoil is the upper layer of soil from which plants obtain their nutrients for growth. It is often darker in colour, due to the organic (humic) fraction. Where topsoil is referred to, it is deemed to be both soil and grass / ground cover fraction.

Waste: means any matter, whether gaseous, liquid or solid or any combination thereof, which is an undesirable or superfluous by-product, emission, residue or remainder of any process or activity (Environment Conservation Act 73 of 1989). In terms of the Waste Management Bill (B39 of 2007) waste means any substance whether or not that substance can be reduced, reused, recycled and recovered – (a) that is surplus, unwanted, rejected, discarded, abandoned, disposed of; (b) where the generator has no further use of for the purposes of production, reprocessing or consumption; (c) that must be treated or disposed of; or, (d) that is identified as a waste by the Minister, but – (i) a by-product is not considered waste; and (ii) any portion of waste once re-used, recycled and recovered ceases to be waste.

*** Waste - General:** is a generic term for waste that because of its composition and characteristics does not pose a significant threat to public health or the environment if properly managed. Examples include domestic, commercial, certain industrial wastes and builders' rubble. General waste may have insignificant quantities of hazardous substances dispersed within it, for e.g. batteries, insecticides, weed killers and medical waste discarded on domestic and commercial properties. General waste may be disposed of on any permitted landfill, (as listed in the Minimum Requirements for Waste Disposal).

*** Waste - Hazardous:** is waste which can, even in low concentrations, have a significant adverse effect on public health and or the environment. This would be because of its inherent chemical and physical characteristics such as toxic, ignitable, corrosive, carcinogenic or other properties. Hazardous waste may only be disposed of at a permitted facility for the hazardous waste category in question.

Wastewater: Water containing pollutants, including chemicals, oils, fuels, soaps, sewerage, or contaminated sediment. Wastewater is to be disposed of as hazardous waste to a permitted facility for the hazardous waste category in question.

Water body/course: Any open body of water including streams (<2m channel width and either perennial or non-perennial), dams (man-made impoundments), rivers (2-10m channel width), major rivers (>10m channel width), estuaries, and the sea.

Wetland: Land which is transitional between terrestrial and aquatic systems and where the water table is at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soils.

iii. LIST OF SUPPORTING DOCUMENTATION

The information contained in this Spoil Disposal Management Plan (SDMP) for the Northern Aqueduct Augmentation (NAA) Project Phase 4, is derived from the Basic Environmental Assessment Report (BAR) as well as the specialist investigations that were commissioned during the Basic Assessment Process. The SDMP forms part of the Environmental Management Plan (EMP) which includes the standard and specific conditions of the Record of Decision (RoD):

- Environmental Basic Environmental Assessment Report: Northern Aqueduct Augmentation Project; Phase 4 *Knight Piésold* 2013.
- A Basic Assessment of the Plant Communities Intersected by Phase 4 of the Northern Aqueduct Augmentation (Phase 4) and a Brief Account of their possible roles in determining Biodiversity.
- Frog Specialist Report for Wetland Areas adjacent to Eastbury Drive and possible impact of Phase 4 on the Northern Aqueduct Augmentation (NAA Ph4) Determining the presence of the critically endangered Pickersgill's Reed Frog, *Hyperolius pickersgilli.*
- Desktop Survey of the Proposed Northern Aqueduct Augmentation, Phase 4, KwaZulu-Natal.
- Northern Aqueduct Augmentation Phase 4: Report on the Public Participation for the Basic Assessment Study.

iv. FOREWORD

This Spoil Disposal Management Plan (SDMP) forms part of the *Environmental Management Plan (EMP) for the Northern Aqueduct Augmentation Phase 4 Project* (*Knight Piésold Consulting 2013*). The Spoil Disposal activities are therefore to be conducted in accordance with the EMP and any associated documentation, which reflect the conditions of authorization (RoD).

The SDMP will attempt to ensure that the Spoil is utilised in the most environmentally sustainable manner, with due consideration for its disposal or reuse in accordance with the relevant legislation and the conditions of the RoD.

1. INTRODUCTION

This Spoil Disposal Management Plan (SDMP) is considered part the Environmental Management Plan (EMP) for the Northern Aqueduct Augmentation Phase 4 Project (*Knight Piésold Consulting*, 2013), and is therefore to be read in conjunction with the EMP and all of its annexure documents.

The excavation activities associated with the installation of the Northern Aqueduct Augmentation Phase 4 pipeline will generate substantial amounts of spoil material. '**Spoil'** refers to excavated soil material (soil, sand, silt, clay and rock) that is removed during trenching, and is not required for the reinstatement or rehabilitation of the working corridor on completion of the pipeline installation. Typically, spoil is treated as '**Waste**' (see definitions above), and is disposed of at a registered landfill facility. However uncontaminated spoil can be more appropriately utilised for a variety of activities, reducing not only the costs and environmental impacts associated with long distance transportation, but also the pressures on landfill facilities. Spoil should only be considered as such where the overburden is uncontaminated and would not confer any further damage to the environment through its reuse.

The SDMP defines the processes necessary to determine the environmentally sustainable disposal of spoil (or overburden) from the working corridor during construction, ensuring suitable end-uses (approved by the DAEARD). The progressive rehabilitation of the entire working corridor is covered by the Rescue and Rehabilitation Programme (RRP). The SDMP is concerned with overburden that is not required for the reinstatement or rehabilitation of the working corridor, which may either be considered contaminated or uncontaminated. The SDMP further provides for the determination of suitable Spoil Disposal Sites or Reuse Proposals.

1.1 Objectives

The objectives of this SDMP are to:

- Ensure that contaminated spoil is disposed of at a permitted facility for the category of waste in question (e.g. builder's rubble contamination might be accepted at a general landfill facility but hazardous substance contamination may only be accepted at a hazardous waste facility)
- Provide a consistent and thorough process for the approval of third party spoil applications for alternative uses such as overburden or engineered fill in other development projects or activities, provided these activities are deemed legal and permitted in terms of the environmental legislation governing the Republic of South Africa
- Provide a consistent process for the identification and selection of sites suitable for spoil disposal, which are legal and compliant in relation to the environmental legislation governing the Republic of South Africa
- Ensure that the transportation and storage of Spoil is managed appropriately
- To ensure that any surplus materials from the project are utilized in a manner that is environmentally sustainable and appropriate

Legislation pertaining to the environment as mentioned above includes but is not limited to:

- National Environmental Management Act (NEMA), No. 107 of 1998 (revised 2010)
- Mineral and Petroleum Resource Development Act (MPRDA), No. 28 of 2002
- National Environmental Management: Waste Act, No. 59 of 2008
- National Environmental Management: Waste Bill (R-39 of 2007)

1.2 Project Context

In June 2012, the *Knight Piésold* Environmental Division was appointed to undertake the necessary environmental investigations associated with the eThekwini Municipality Water and Sanitation (EWS) proposal to construct a ~5km bulk water pipeline to be known as Phase 4 of the Northern Aqueduct Augmentation (NAA) Project.

Because the construction of the WA (Phase 2) has been put on hold, an alternative link (NAA Phase 4 (or the Engineers Phase 3) is currently being proposed. This is to provide water from the EXISTING NAX into NAA Phase 1, so that Cornubia and other developments in the north of Durban, can be provided with water within the next 18 months, as the construction of the WA Ph2 will only reach the starting point of the NAA Ph2 (at Emachobeni) in five years time (optimistically).

It is thus proposed that a new 1.2m pipe be laid in parallel with the existing pipelines (to remove the bottleneck in the system) **between Duffs Road and Phoenix 2 Reservoir**. This pipeline forms Phase 4 of the NAA and is required to be commissioned at the same time as NAA Ph 1, i.e. 2014.

The existing two pipes within the servitude will continue to be used (current daily volume approximately 50,000m^3). The new bigger pipe will merely augment the existing pipelines which are presently a bottleneck in the system. The old pipes are much smaller (450 – 500mm) in diameter, and as such when the new pipe is tied into the system, the water will prefer the path of least resistance, and thus most of it, will 'choose' the bigger pipe. The ultimate 30-year demand in the system will result in a total flow of about 120,000 m^3 per day, of which 100,000 m^3 per day will flow in the new (bigger) pipe as a result of its lower friction loss.

The project was registered with the Department of Agriculture, Environmental Affairs and Rural Development (DAEARD) as EIA No: DM/0065/2012 as per the requirements of the governing environmental legislation at the time: Regulations pursuant to the National Environmental Management Act of 1998 (as amended in July 2010).

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1.3 Project Detail

Table 1.2 Contact Details for the Project

PROJECT: EIA No.: DM/0065/2012	Northern Aqueduct Augmentation Phase 4
APPLICANTS	EThekwini Water and Sanitation (EWS)
CONTACT PERSON (APPLICANT)	Monte Montemerano Tel: 031 311 8742, Fax: 031 311 8545 MontyMo@dmws.durban.gov.za
NATURE OF THE DEVELOPMENT	Steel gravity-fed potable water pipeline project
PIPELINE LENGTH	5 linear kilometres
JURISDICTION	EThekwini Municipality
CURRENT LAND USES	Predominantly road reserve, existing electrical servitude, open space
LISTED ACTIVITY IN TERMS OF THE NEMA (No. 107 of 1998, revised June 2010)	Regulation No. R 544 (Listing Notice 1, Activities 9, 11, 18 & 37) Regulation No R 545 (Listing Notice 2, Activity 10)
INDEPENDENT ENVIRONMENTAL CONSULTANTS	Knight Piésold (Pty) Ltd. Contact: Deepa Seepersad Tel: 031 276 4660, Fax: 031 262 2950 dseepersad@knightpiesold.com PO Box 383, Westville 3630

1.4 SDMP in its Legal Context

Neither the Environment Conservation (Act 73 of 1989) nor the NEM: Waste Management Bill (B-39 of 2007) provide definitions for 'Spoil' either. However, the Waste Management Bill states that:

> *"waste means any substance whether or not that substance can be reduced, reused, recycled and recovered – (a) that is surplus, unwanted, rejected, discarded, abandoned, disposed of; (b) where the generator has no further use of or for the purposes of production, reprocessing or consumption; (c) that must be treated or disposed of; or, (d) that is identified as a waste by the Minister" (NEM: Waste Management Bill B-39 of 2007).*

And the Waste Management Bill in its definition of waste further qualifies:

> *but – (i) a by-product is not considered waste; and (ii) any portion of waste once re-used, recycled and recovered ceases to be waste" (NEM: Waste Management Bill B-39 of 2007).*

If 'Spoil' is deemed a by-product of this activity, and/or a reuse, recycle or recovery opportunity is identified for its further use, it can be concluded that such 'spoil' cannot be classified as 'waste' and an alternative condition of authorisation for its 'disposal' should be sought.

This SDMP outlines the disposal, reuse, recycle or recovery options for 'Spoil', and it is intended that once approved by the Department of Agriculture and Environmental Affairs (DAEARD), the SDMP become incorporated into the conditions of the RoD.

1.5 Defining Categories of Spoil

The term 'spoil' for the purposes of this SDMP refers to any 'overburden', soil, topsoil, subsoil, rock or the like which will be removed/excavated from the trenches for the purposes of installing the pipeline, which will be in excess and cannot be later replaced into the trench due to the presence of the pipe, its associated structures and bedding material, and which will require suitable 'disposal' or end use.

In terms of handling and disposal options, the term 'spoil' can be further categorised into 'contaminated' and 'uncontaminated' spoil. '**Contaminated Spoil**' refers to polluted spoil containing builder's rubble or 'hazardous substances' (refer Glossary) and is to be considered as 'general' waste or 'hazardous' waste (refer Glossary) and is therefore to be disposed of in accordance with these classifications.

'**Uncontaminated spoil**' does not compose of any substance or compound which may have a detrimental impact on health and the environment, and is potentially useful as fill or overburden. Such spoil may therefore be considered for use by third parties in other development projects or activities in accordance with the recommendations of this SDMP.

1.6 General Handling, Disposal or Reuse

Spoil stockpiles are to be managed in accordance with the EMP, including that these stockpiles:

- Are to be kept at the appropriate height to prevent compaction.
- Are to be placed in appropriate areas of the working corridor (outside of Flagged Resource sites such as wetlands and away from water bodies) in a manner that does not obscure driver visibility.
- Are to be protected from wind and water erosion.
- Are to be kept clear of alien invasive plants.
- Are not to become mixed with topsoil or subsoil stockpiles to be used in the reinstatement or rehabilitation of the site.

Transportation of spoil to approved sites is to be managed in accordance with the EMP, and must include that:

- Spoil disposal vehicles are to be maintained in an acceptable working condition with a maintained service history booklet. Construction vehicles may not be serviced on site except unless specified by the EMP.
- Spoil disposal vehicles, where possible, must be routed away from noise sensitive areas e.g. residential suburbs, schools, and crèches.
- All transport routes of disposal vehicles must be reviewed and approved by the Environmental Consultant prior to transportation activities commencing.
- Speed limits off-road and on road are to be strictly enforced.

- Vehicles transporting spoil should be covered to prevent spills.
- Drivers are to be licensed, competent and inducted on site.

Disposal of contaminated or uncontaminated spoil must be to a registered landfill site or hazardous waste facility and proof of disposal is to be retained in the form of a Disposal certificate.

Reuse of spoil by Third Parties or as fill in Ancillary Spoil Disposal Sites is to be conducted in the methods described in the relevant sections of this report and approved by the Environmental Consultant. If the proposed reuse activity is a listed activity in terms of the Environmental or Mining legislation then proof of the authorisation is required before reuse options are undertaken.

2. ROLES & RESPONSIBILITIES

The Developer, Engineers and Contractor shall comply with the Environmental Management Plan for the NAA Phase 4 Project, KZN, and as this SDMP forms part of the EMP they shall also comply with the specifications of this report. The Contractor is also responsible for ensuring that all sub-contractors, suppliers and staff appointed by them also adhere to the conditions of the EMP and SDMP.

2.1 Developer

For the purposes of this document, 'Developer' refers to the client eThekwini Municipality Water and Sanitation, who must ensure that the Conditions of the RoD are adhered to at all times, through oversight of the Engineers, who will oversee the Contractors. Given this role, the Developer must ensure that the approval of spoil reuse and disposal is executed in accordance with the SDMP.

2.2 Engineers

For the purposes of this document, 'Engineers' refers to the NAA Phase 4 Consortium, who will provide consulting engineering services including advice and engineering guidance on site in order to ensure adherence to all design and engineering specifications. Given this role, the Engineers must ensure that spoil disposal sites or reuse options that are selected are done so in accordance with the SDMP; that the Contractor disposes of Spoil in accordance with the SDMP; and that third party spoil reuse applications have been approved in accordance with the SDMP.

2.3 Contractor

For the purposes of this document, the term 'Contractor' refers to the main contractor(s) appointed to undertake the construction of the project, or portion of the construction of the project. Given this role, the Contractor must select spoil disposal or reuse options that are legally compliant or permitted as required by this SDMP, and must oversee stockpiling, loading and transport of spoil in accordance with the requirements of the EMP.

2.4 Environmental Consultants

For the purposes of this document, the term 'Environmental Consultant' refers to *Knight Piésold Consulting*, who are the company responsible for the development of the EMP including the SDMP. Given this role, the Environmental Consultant must review and approve third party spoil reuse applications and selected spoil disposal sites in accordance with this SDMP before the Contractor makes use of any of these options.

2.5 Environmental Control Officer

The ECO provides input and environmental guidance on site in order to ensure adherence to the EMP and general project environmental sustainability. Given this role the ECO will monitor the stockpiling, loading and transport of Spoil material, and will request from the Contractor the necessary certificates of disposal when applicable.

2.6 Department of Agriculture, Environmental Affairs and Rural Development

The DAEARD are the Environmental authority in KZN who will ensure compliance with the EMP and general environmental sustainability. Given this role, the DAEARD must audit the environmental monitoring process and reports prepared by the ECO, including documentation pertaining to the spoil handling, stockpiling and disposal options accepted/approved by the Developer. The DAEARD are to implement legal action on the Developer if non-compliance with the SDMP is deemed severe enough.

2.7 Third Party Spoil Reuse Applicant

For the purposes of this report 'Third Party' refers to the person/organisation/company with a spoil reuse proposal in an activity other than that associated with the NAA Phase 4 project. The third party spoil reuse applicant must supply sufficient activity detail to the Environmental Consultants together with the grade and quantity of spoil needed. Should the third party spoil reuse applicant propose a reuse activity that is listed in terms of any environmental legislation, they must furnish the necessary RoD, EMP or Environmental Management Programme (EMPR).

3. CONTAMINATED SPOIL DISPOSAL

The only means of disposing of contaminated spoil is to a facility that is licensed to receive the waste category that the contaminated spoil falls within. For example, spoil that has become contaminated with chemicals, oils or similar hazardous substances may only be disposed of as hazardous waste to a facility that caters for hazardous waste (refer **Table 3.1**), whilst spoil that has become contaminated with builder's rubble/material or woody vegetation may be disposed of as general waste to a general landfill facility (refer **Table 3.2**).

3.1 Spoil Contaminated with Hazardous Substances

Table 3.1 Spoil Contaminated With Hazardous Substances	
CATEGORY	**Hazardous Waste:** Spoil contaminated with hazardous substances which can, even in low concentrations, have a significant adverse affect on public health and/or the environment. This would be because of the inherent chemical and physical characteristics such as toxic, ignitable, corrosive, carcinogenic or other properties.
CONTAMINANTS	Substances including but not limited to wastewater, chemicals, solvents, fuels, oils, and lubricants as liquids, solids or gases that are harmful or potentially dangerous to human and/or environmental health. 'Harmful/dangerous' refers to the substances' inherent chemical and physical composition that could be toxic, poisonous, explosive, carcinogenic, flammable or radioactive.
HANDLING & STORAGE	Spoil contaminated with hazardous substances will be treated as hazardous waste, and immediately bagged and relocated to a bunded and secure area of the site until removal to a suitable facility.
TRANSPORT	Spoil contaminated with hazardous substances is to be transported to the relevant facilities in accordance with the relevant sections of the EMP. Vehicles used for transportation from site are to comply with the relevant sections of the EMP, and drivers are to be trained in the same environmental induction sessions as 'all staff' on site are required to be.
SUITABLE FACILITIES	Hazardous waste may only be disposed of at a permitted facility for the hazardous waste category in question.
PROOF OF DISPOSAL	Certificate to be obtained on delivery of the hazardous waste to the appropriate facility.

3.2 Spoil Contaminated with General Waste

Table 3.2 Spoil Contaminated With General Waste	
CATEGORY	**General Waste:** Spoil contaminated with rubble, vegetation or inert substances that because of their composition and characteristics do not pose a significant threat to public health or the environment if properly managed.
CONTAMINANTS	Builder's rubble, woody debris, building materials, general waste, domestic waste, packaging.
HANDLING & STORAGE	Contaminated spoil will be stockpiled separately and may not be mixed with other spoil, topsoil, or subsoil. Stockpile activities are to be conducted in accordance with the relevant sections of the EMP.
TRANSPORT	Spoil contaminated with general waste is to be transported to the relevant facilities in accordance with the relevant sections of the EMP. Vehicles used for transportation from site are to comply with the relevant sections of the EMP, and drivers are to be trained in the same environmental induction sessions as 'all staff' on site are required to be.
SUITABLE FACILITIES	General waste may be disposed of on any permitted landfill, (as listed in the Minimum Requirements for Waste Disposal).
PROOF OF DISPOSAL	Certificate to be obtained on delivery of the general waste to the landfill facility.

4. UNCONTAMINATED SPOIL DISPOSAL

Uncontaminated spoil will be disposed of in one of three ways:

- To registered Landfill Facilities (hopefully to be used as cover material at the end of each day)
- To a third party on submission of a Spoil Application (sites and uses to be approved as per the process described below)

- To Ancillary Spoil Disposal Sites (to be determined by the Engineers and approved by the Environmental Consultant or relevant authority as per the process described below).

4.1 Registered Landfill

Uncontaminated spoil may be disposed of at a registered landfill facility, where a certificate of disposal must be obtained on delivery. In addition to disposing of uncontaminated spoil as general waste, it may also be considered by the facility as cover material if it meets the requirements of that facility in terms of cover. In any event, uncontaminated spoil that is disposed of at a landfill facility is subject to the handling and transport conditions for soil or material as described by the EMP (**Table 4.1**).

Table 4.1 Uncontaminated Spoil To Landfill

CATEGORY	**General Waste or Cover:** Spoil, although not contaminated in any way may still be disposed of to a registered landfill facility either as General Waste or as cover if of a suitable standard (as determined by the facility).
AGREEMENT	The Contractor is to identify the landfill facilities, and make these choices known to the Consulting Engineers. The Contractor will determine the quantity of spoil that the facilities are willing to cater for on a given day. The landfill facilities will determine whether the spoil will be disposed of as General Waste or as cover.
HANDLING & STORAGE	Uncontaminated spoil will be stockpiled separately from topsoil, subsoil and contaminated spoil. Stockpile activities are to be conducted in accordance with the relevant sections of the EMP.
TRANSPORT	Uncontaminated spoil is to be transported to the landfill facilities in accordance with the relevant sections of the EMP. Vehicles used for transportation from site are to comply with the relevant sections of the EMP, and drivers are to be trained in the same environmental induction sessions just as 'all staff' on site are required to be trained.
SUITABLE FACILITIES	Any permitted landfill, (as listed in the Minimum Requirements for Waste Disposal).
PROOF OF DISPOSAL	Certificate to be obtained on delivery of the spoil to the landfill facility.

4.2 Third Party Applications

Uncontaminated spoil potentially has many uses, and this section provides a consistent and thorough process for the approval of third party spoil applications for alternative uses such as overburden or engineered fill in other development projects or activities, provided these activities are deemed legal and permitted in terms of the environmental legislation governing the Republic of South Africa (refer **Table 4.2**).

Table 4.2 Uncontaminated Spoil To Third Parties

CATEGORY	Uncontaminated Spoil may be reused by Third Parties provided the reuse activity is legal, and (if required) the necessary authorisations / permits / licences are in place. The Engineers are to determine a minimum quantity requirement for third party applicants.
APPLICATIONS	Third Parties are to submit an Application to the Environmental Consultants for review and approval. These Applications are to include: 1. *The proposed reuse of the spoil, and the quantity and standard/grade of spoil required.* 2. *The property and site information, including a layout plan and proof of ownership.* 3. *A management plan or method statement for the handling, stockpiling, haulage and reuse of the uncontaminated spoil.* If the activity proposed is a listed activity in terms of: a. *The Environmental Impact Assessment Regulations, 2006, made under section 24(5) of NEMA and published in Government Notice No. R. 385 of 2006 and Government Notice No. R. 386 of 2006.*

	b. *The Mineral and Petroleum Resource Development Regulations, 2004, made under section 107(1) of MPRDA, and published in Government Notice No. R 527 of 2004.* Then proof of the following must also be included: 1. *A Record of Decision (RoD) authorising the activity the spoil will contribute towards (in the case of an activity authorised by the DAEARD); or* 2. *An approved Environmental Management Programme (EMP) and Closure Plan (in the case of an activity authorised by the Department of Minerals and Energy – DME); or* 3. *Mining right or mining permit (in the case of an activity authorised by the DME); or* 4. *The rehabilitation plan if not stated in the EMP or Closure Plan (in the case of an activity authorised by the DME); or* 5. *A waste management license (issued in terms of Section 49 of National Environmental Management: Waste Act, No. 59 of 2008).*
APPROVALS	The Environmental Consultants are to assess the applications, and if approved are to issue the Third Party with a letter of approval. The Contractor and the Third Party are to sign a contract describing the standard and quantity of spoil to be accepted by the Third Party, as well as agreements pertaining to transport costs, delivery requirements and storage. The ECO will monitor and audit these activities.

4.3 Ancillary Spoil Disposal Sites

Additional Spoil Disposal Sites (ASDS) may be required if the capacity at local landfills is reached or if Third Party Spoil Applicants do not 'emerge' in sufficient numbers or require sufficient volumes. These ASDS will be identified by the Engineers and/or Contractor, but must be assessed by the Environmental Consultants (refer **Table 4.3**). Should environmental authorisations be required then these are to be obtained prior to spoil disposal at these sites. Typical sites would mostly include quarries and sand winning operations requiring soil for rehabilitation and reshaping of the landscape to a pre-mining condition. In many instances environmental approval would not be required as site rehabilitation would be a requirement of the 'mine' closure.

Table 4.3 Procedures For Identifying Ancillary Spoil Disposal Sites

CATEGORY	Uncontaminated Spoil may be reused as fill in an Ancillary Spoil Disposal Site (ASDS) provided the reuse activity is legal, and (if required) the necessary authorisations / permits / licences are in place.
PROCESS	The Engineers / Clients Representatives are to determine criteria for suitable ASDSs based on the quantity of spoil to be generated, locality of the excavations, and the range in the grade of the spoil materials such as: • Maximum distance from active site and open trench acceptable for haulage • Suitable accessibility of ASDSs and appropriateness of the road infrastructure to accommodate haulage vehicles • Minimum capacity for ASDSs • Suitability of sites to receive the grades of spoil in question • Appropriateness of sites to receive fill Sites meeting the engineering criteria are to be submitted to the Environmental Consultants for review and approval. These Applications are to include: 1. *The current land use of the ASDS* 2. *The property and site information, including a layout plan and proof of ownership.* 3. *A management plan or method statement for the handling, stockpiling, haulage and reuse of the*

	uncontaminated spoil. If the activity proposed is a listed activity in terms of: *a) The Environmental Impact Assessment Regulations, 2006, made under section 24(5) of NEMA and published in Government Notice No. R. 385 of 2006 and Government Notice No. R. 386 of 2006.* *b) The Mineral and Petroleum Resource Development Regulations, 2004, made under section 107(1) of MPRDA, and published in Government Notice No. R 527 of 2004.* Then proof of the following must also be included: *1. A Record of Decision (RoD) authorising the activity the spoil will contribute towards (in the case of an activity authorised by the DAEARD); or* *2. An approved Environmental Management Programme (EMP) and Closure Plan (in the case of an activity authorised by the Department of Minerals and Energy – DME); or* *3. Mining right or mining permit (in the case of an activity authorised by the DME); or* 4. *The rehabilitation plan if not stated in the EMP or Closure Plan (in the case of an activity authorised by the DME); or* 5. *A waste management license (issued in terms of Section 49 of National Environmental Management: Waste Act, No. 59 of 2008).*
APPROVALS	The Environmental Consultants are to assess the applications, the suitability of the ASDS, and the suitability of the spoil material, and if approved are to issue the Contractor with a letter of approval. The Contractor and the ASDS owners are to sign a contract describing the standard and quantity of spoil to be accepted by the owners, as well as agreements pertaining to transport costs, delivery requirements and storage. The ECO will monitor and audit these activities.

The Engineers/Client Representatives must determine the appropriate criteria for the sites; the Contractor is to identify suitable sites which meet the criteria set, the Environmental Consultant must assess the sites and any associated environmental or mining approvals; and the land owners must be approached and the relevant land legal negotiations must be approved.