ENVIROPRO

IN ASSOCIATION WITH INKANYEZI YETHU

MAY 2024

THE CONSTRUCTION OF THE UMDONI SOUTH WATER AUGMENTATION PROJECT RESULTING IN THE CONSTRUCTION OF INFRASTRUCTURE AND ASSOCIATED WATERCOURSE CROSSINGS THAT HAVE A FOOTPRINT OF MORE THAN 10M^2 WITHIN THE EFZ REQUIRING THE EXCAVATION AND INFILL OF MATERIAL FROM A WATERCOURSE IN EXCESS OF 10M^3 AND 5M^3 FROM WITHIN 100M OF THE SEA'S HIGH-WATER MARK AS WELL AS THE CLEARANCE OF MORE THAN 300M^2 FROM AN ENDANGERED ECOSYSTEM

UMDONI LOCAL MUNICIPALITY
UGU DISTRICT MUNICIPALITY

EIA REF: DC21/0003/2024

EVP1621

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THIS REPORT WAS PREPARED BY ENVIROPRO ENVIRONMENTAL CONSULTING

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1.1. Background

The Ugu District Municipality proposes to construct a water pipeline within the uMdoni Local Municipality, through nine communities: Umdoni, Pennington, Kelso, Malangeni, Sezela, Ifafa, Bazley and Elysium. These areas form part of Wards 7 to 10 of the Ugu Municipality, KwaZulu-Natal.

1.2. Scope of Work

Prepare a site-specific EMPr to manage and mitigate potential environmental impacts during construction. The provisions of this EMPr are binding on the contractor throughout the life of the contract.

1.3. General Principles and Purpose of This EMPr

The purpose of this EMPr is to guide all contractors and site workers on how to operate responsibly to achieve these goals and ensure that the requirements of the legislation are met. This EMPr is a working document to be used during construction and has been generated to ensure that:

- The protection of the environment during the construction period.
- All emissions to air water and soil are controlled and managed to mitigate their impacts on the environment and surrounding communities.
- Nuisance factors associated with construction are controlled as far as is reasonably possible.
- The correct principles are followed from the very beginning during site set up, thereby reducing frustrations on the part of the contractor when asked to comply with the strictures of the EMPr and relevant environmental legislation.
- The post-construction clean-up is carried out correctly to avoid environmental impacts and meet the legislated requirements.

This EMPr is subject to change as brought about by variations in the project specification, and any changes must be approved by the relevant authorities.

1.4. Responsibilities

The Project Applicant (Ugu Municipality) is responsible for:

- Ensuring that the engineer and contractors comply with the approved EMPr.
- Ensuring compliance with the provisions for duty of care and remediation of damage per section 28 of the National Environmental Management Act (NEMA), (No. 107 of 1998) and its obligations regarding the control of emergency incidents in terms of Section 30 of NEMA.
- Notifying the relevant authorities (EDTEA) of any incident as defined in subsection 30(1) (a) of NEMA.
- Ensuring that the mitigation measures to address environmental impacts identified are carried out by the contractor.

The Project Manager or Engineer is responsible for:

- Appointing a qualified contractor and ensuring that they have read and understood the EMPr and Environmental Authorisation (EA).
- Ensuring all work undertaken is per the EMPr and EA.

- Ensuring adherence to safety, health and environment (SHE) standards and ensuring the construction activities comply with the EMPr.
- Arranging for the site to be monitored daily to ensure compliance with the EMPr and EA.
- Overall responsibility and accountability for the site during the construction phase.
- Mitigating impact on the environment through responsible operation and adherence to the EMPr and EA.
- Ensuring transparency in their operation and environmental management of the site.
- Managing the contractor to ensure that they adhere to the EMPr and EA and ensuring that all necessary documentation is maintained on-site.
- Ensuring that the contractor has a copy of the EMPr, EA and Method Statements.

The Site Contractor(s) is/are responsible for:

- Providing a suitable person to operate as Environmental Officer (EO) to undertake the monitoring of the day-to-day requirements of the EMPr and EA.
- Operating per the EMPr and carrying out construction activities with due care and diligence.
- Ensuring that any communications from stakeholders are reported to the Environmental Control Officer (ECO).
- Maintaining relevant documentation for review by the ECO.
- Undertaking the mitigation measures to address the environmental impacts identified.

The Environmental Officer (EO) or designated Safety Health Environment (SHE) officer is responsible for:

- Daily compliance monitoring of construction against the requirements set out in this EMPr, and the environmental authorisation.
- Undertaking the mitigation measures to address the environmental impacts identified.
- Ensuring that all site staff are adequately trained in environmental matters.
- Liaising with site staff and I&APs through the Community Liaison Officer (CLO), if required.
- Must be conversant with the applicable legislation pertaining to the environment.
- Liaise directly with the ECO on the monthly audit findings.
- Identification of possible areas of improvement during construction.
- Monitoring the construction site regularly and recording key findings.
- Advising the Project Manager and the contractors on environmental matters.
- Provide recommendations to address and rectify these matters.
- Monitoring implementation of the EMPr by the contractor.
- Work hand in hand with the health and safety officer.
- Maintain records pertaining to the requirements of the EMPr and EA.

The Environmental Control Officer (ECO or Independent environment practitioner) is responsible for:

- Conducting regular auditing against the requirements of the EMPr and EA.
- Liaising directly with the EDTEA and supplying them with copies of the audit reports.
- Liaising directly with the contractor and EO and supplying them with a copy of the audit reports.

1.5. Monitoring

The key to a successful EMPr is effective monitoring and review to ensure the effective functioning of the EMPr and to identify and implement corrective measures in a timely manner. The EO must be responsible for day-to-day monitoring and reporting while the ECO must undertake to monitor the site on a monthly basis. The day-to-day monitoring must be conducted by the EO in conjunction with the contractor and the engineer. The monthly audit report by the ECO can then be used to provide external monitoring and reporting to EDTEA Compliance and Enforcement. Paramount to the reporting of non-conformances or incidents is that corrective and preventive action plans are developed and adhered to. Photographic records of all incidents and non-conformances must be retained. Non-compliances identified by the ECO must be resolved within fourteen days of being noted, incidents that are deemed by the ECO to have a large environmental impact must be resolved immediately.

1.6. Applicable Legislation

The site engineer must be aware of any compliance issues raised by the EO and ECO and must ensure that the necessary corrective measures are implemented. As per the National Environmental Management Act No 107 of 1998 (Section 28), offending parties may be held financially accountable for any pollution or environmental damage.

The following environmental legislation must be adhered to:

- The Constitution of South Africa (No. 108 of 1996)
- National Environmental Management Act (Act 107 of 1998)
- National Water Act (Act 36 of 1998)
- National Environmental Management: Waste Act (Act 59 of 2008)
- National Environmental Management: Air Quality Act (Act 39 of 2004)
- National Environmental Management: Protected Areas Act (Act 57 of 2003)
- National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
- National Forest Act (Act 84 of 1998)
- Environmental Conservation Act (Act 43 of 1996)
- National Environmental Management: Biodiversity Act (Act 10 of 2004)
- National Heritage Resources Act (Act 25 of 1999)
- KwaZulu-Natal Heritage Act (Act 4 of 2008)
- Mineral & Petroleum Resources Development (Act 28 of 2002)
- Occupational Health and Safety Act (Act 181 of 1993)
- Hazardous Substances Act (Act No. 15 of 1973)
- National Building Regulations and Building Standards Act (Act 103 of 1977)
- Relevant local bylaws

This EMPr meets the requirements of the stipulations provided in Appendix 4 of NEMA, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulations, 2014 with regards to the content of EMPr. This EMPr has been developed to specifically address the impacts related to this project in each phase of development.

1.7. The layout of the EMPr

The EMPr is divided into six sections dealing with an Introduction and description of the proposal and the site, Pre-Construction and Site Set Up, Construction Activities and Post Construction, Rehabilitation and Operation Activities. Sections 5 and 6 provide definitions and records that can be used to record training, incidents, and complaints. Under the construction section, each section deals with a specific aspect of the development, i.e., administration and records. Within these sections, the specific activity is described, and the mitigation action required is provided. The tables have been set up to enable ease of auditing with a section for the EO/SHE officer or ECO to state whether mitigation measures have been put in place and to make a comment about any problems noted.

1.8. Impact Management Objectives and Outcomes

The following objectives and outcomes must be considered for this project:

- Objectives:
  - For there to be no lasting negative impacts on the environment once construction is complete, specifically within the identified indigenous vegetation and watercourses associated the Umdoni South Water Augmentation Project.
  - To practice responsible construction, 'best practice', with regards to housekeeping on-site during construction (outlined within the EMPr) and enforce the polluter pays principle. The applicant/contractor must be responsible for their actions on-site during construction and the rehabilitation of the site post-construction.
- Outcomes:
  - To promote sustainable development. Create infrastructure and an environment that is healthy and sustainable for future generations.
  - The implementation of the rehabilitation plan improves the condition of the environment on the pipeline route.

1.9. Project Details

The Ugu District Municipality proposes to upgrade the existing water supply network within the uMdoni Local Municipality, through nine communities: Umdoni, Pennington, Kelso, Malangeni, Sezela, Ifafa, Bazley, GDP and Elysium (Figure 1). These areas form part of Wards 7 to 10 of the uMdoni Local Municipality, KwaZulu-Natal.

An existing bulk water pipeline is in place in the region, however, the pipeline currently supplies 25ℓ per person per day which does not sufficiently serve the project area. There are also numerous illegal connections which could result in the collapse of the entire system. The project area's water infrastructure is currently being supplied from two water treatment works (WTW) via existing bulk pipelines, and through existing storage reservoirs and reticulation system. Analysis of the current network has revealed that the existing water supply and infrastructure are insufficient for the current demand, and it is strained by the growth that has taken place in the area. The deterioration of the infrastructure has also lead to multiple leaks. Furthermore, there is currently no reticulation infrastructure within the GDP area, whereby this community is currently without water supply, though other surrounding communities have had water.

Therefore, the ultimate goal of the applicant is to provide improved access to a potable water supply by constructing new infrastructure and upgrading existing infrastructure in order to satisfy the increasing water demand throughout the entire project area. Ultimately the project will uplift standards of living in the communities serviced by the new project and provide employment for local labour forces during construction. To achieve this goal the proposed agumentation project will include 47.83km of pipeline (Figure 2), comprising 37.43km of both new and upgraded bulk mains and 10.40km of newly constructed reticulated pipeline in the GDP area.

The existing bulk main which runs from Sezela Cricket Grounds on Sezela Drive and extending South along the coastline to the town of Elysium will be replaced as it has deteriorated and insufficient to meet demand. In some sections, the existing pipeline infrastructure could not be followed, and will therefore be re-routed to a better alternative route (Refer to Figure 2 and Table 1). New bulk mains will also be constructed as part of the proposal; these bulk mains will be constructed between the towns of Ifafa, Glebe and Pennington, and will run through Malangeni and parallel to the N2 highway (Table 2). Most of the project area is currently receiving water through these systems, and so reticulation pipelines for these areas will not fall part of the scope of works for this project. However, reticulation pipelines have been included in this project for the newly developed area of GDP, which does not have an existing reticulation system and has no official water supply (Table 3). Figure 2 provides an overview of the proposed new bulk mains and the position of existing bulk mains.

To summarise:

- The bulk system will consist of mains varying in diameter from 100mm to 350mm:
  - Umdoni Command Reservoir:
    - 315mm diameter pipeline to the Malangeni Reservoir D and Reservoir E through a pumped system
    - 250mm diameter pipeline to supply Kelso, Pennington and Hilltop.
  - Kelso, Pennington and to Umdoni:
    - These pipelines will be replaced and upgraded, then have their flow reversed from Umdoni to Pennington to Kelso.
  - Hilltop passing through GDP:
    - A new pipeline will be laid which will also have its own designated pipeline for bulk supply supplied from the existing 1,27Ml Umdoni Reservoir.
  - Elysium, Bazley and Ifafa:
    - Pipelines replaced to the same pipe diameters that are currently supplying the area, because these communities have seen very minimal growth in the past few years.
  - Galvanized steel pipes will be used in the Umdoni South Bulk Water Augmentation project as requested by Ugu District Municipality.
- The reticulation water system will run through the GDP area, and supply each household, and will have meters at each entrance point. Various pipe diameters will be used throughout the reticulation system. Pipes that are larger than 50mm in diameter will be built using uPVC, and pipes smaller than 50mm in diameter will be built using HDPE materal.

Table 1: Pipe lengths for replacement (Source: EnSync Preliminary Design Report)

Hydraulic Zone	Proposed Diameter (uPVC)	Pipe Length (m)
Elysium – Ifafa	160	5467.711
Ifafa – Bazley	160	6348.609
Bazley – Hilltop	160	5486.187
	Total Length	**17 302.507**

Table 2: Pipe lengths for system upgrade (Source: EnSync Preliminary Design Report)

Hydraulic Zone	Flow (l/s)	Proposed Diameter (GMS)	Pipe Length (m)
Umdoni Main Reservoir (Inlet from Umgeni SCP2)	92.59	350	
GDP	6.77	100	1920
Kelso	7.83	100	3272.78
Pennington	15.37	150	52.478
Hilltop	16.36	150	4334.77
Malangeni (Res E)	11.34	150	2180.16
Leg 1 (Hilltop, Kelso, and Pennington)	91.80	250	86.54
Leg 2 (Kelso + Pennington)	23.21	200	1338.67
Leg 3 (Malangeni)	52.23	300	6890.911
		Total Length	**20 126.301**

Table 3: Pipe lengths for system upgrade (Source: GDP Design Proposal Report)

Pipe Diameter	Pipe Length (m)
25mm diameter	2100
50mm diameter	3500
75mm diameter	2800
110mm diameter	2000
Total Length	**10 400**

As part of the project scope, the reservoirs feeding the bulk lines will be refurbished and where necessary capacities increased. Umdoni Reservoir, Malangeni Reservoir D and Malangeni Reservoir E will have their capacities increased, and these reservoirs will remain in the same location as they currently stand. All other existing reservoirs, namely Kelso, Pennington and Hilltop, will be refurbished. The Water Supply System (WSS) is serviced partly by gravity-fed pipes, and some by the use of pump stations, this existing infrastructure will also be refurbishment as part of the project scope.

There are multiple sections of pipeline where the route will need to cross the existing roads, two of which cross the N2. It is required by the Department of Transport (DoT) that all road crossings be done by pipe boring. However, it has been proposed that gravel road crossings be constructed by open-cut trenching with the necessary

provision for traffic deviations and control. This proposal will be confirmed with DoT prior to construction whilst allowance is made for pipe boring for all road crossings. For the N2 road crossings, a pipe jack will be used.

There are 36 watercourse crossings along the pipeline route. Although no wetlands have been identified within the project area, numerous riparian and estuarine environments have been delineated. Refer to Section 2 of the BAR which provides more details as to these delineations:

- WC2, WC21, WC26, WC27, WC31, WC35, WC36
  - The pipeline will be attached to existing structures already placed within the watercourses and estuaries. Because of the recent floods, it is believed that the optimal solution is to anchor the pipes securely onto the structures within the watercourse. This measure aims to prevent the pipeline from being swept away during periods of high water flow. Additionally, this approach minimizes further disturbance to the already affected watercourses, as it eliminates the need for additional excavation within them.
- WC4, WC5, WC6, WC7, WC8, WC16, WC17, WC20, WC33
  - The pipeline will be trenched beneath the watercourses but do not follow existing infrastructure reserves. Excavation will be undertaken in low-flow season (dry season) and full rehabilitation will be carried out post-construction. Therefore, the flow of the watercourse will not be impacted.
- WC1, WC3, WC9, WC10, WC11, WC12, WC13, WC14, WC15, WC18, WC19, WC22, WC23, WC24, WC25, WC28, WC29, WC30, WC32, WC34
  - These watercourse crossings will be within an existing road reserve with the pipeline being trenched below ground level within the road prism. Therefore, there will be limited impact on these areas, as they have already been disturbed.

Table 4 below provides details of the total volume of material infilled/excavated from the watercourses (does not include WC2, WC21, WC26, WC27, WC31, WC35, WC36 as these will be attcahed to existing structures), while Table 5 provides total infrastructure that are within 32m of watercourses as well as infrastructure within estuarine functional zones.

Table 4: Volume Calculations Within Watercourses

The following is applicable:	
Total length of water pipeline within watercourses[1] **(A)**	1611.58m
Width of the trench **(B)**	1m
Depth of trench **(C)**	3m
Total volume of material infilled/excavated from the watercourse[2] (A x B x C)	= 4834.74m^3

[1]Please note this distance only takes into consideration the portion of the pipelines that crosses the watercourses. The remainder of the working servitude will not require excavation or infilling from these watercourses.
[2]Please note due to the nature of the pipelines i.e. below the watercourse, the total volume of excavated material will equal the total Volume of infilled material.

Table 5: Area Calculations Within 32m Of Watercourses

The following is applicable:	
Total length of water pipeline within 32m of watercourses within rural areas **(A)**	12257.24m
Total length of water pipeline within 32m of watercourses within estuarine functional zones **(B)**	1885.32m
Maximum width of pipes **(C)**	0.35m
Total area of pipeline within 32m of watercourse[1] (A x C)	= 4290.03m^2
Total area within estuarine functional zones (B x C)	= 659.86m^2

[1]Please note this distance only takes into consideration the portion of the pipelines that fall within rural areas.

To support the construction of the water pipelines a small working servitude is required to ensure there is available working space on either side of the pipeline for access for construction personnel as well as an area to support the stockpiling of material. The maximum servitude will be 10m. The topsoil will be removed along the proposed pipeline route to suit trench width, at a depth of 300mm, divided into 100m intervals, and stockpiled separately from the other excavated material. There will be a need to clear vegetation along the water pipeline route and within the 10m working servitude (Figures 2-20). The area falls within the endangered KwaZulu-Natal Coastal Belt Grassland ecosystem type.

As above, the proposed construction methodology is to place the entire pipeline beneath ground level, aside from the sections being attached to existing structures. Therefore, upon completion, previously vegetated areas that were cleared can be suitably rehabilitated. Table 6 below provides details of the indigenous vegetation clearance required for the project.

Table 6: Area Calculations For Temporary Clearance Of Indigenous Vegetation

The following is applicable:	
Length of the water pipeline which requires clearance of indigenous vegetation **(A)**	47 828.81m
Width of working corridor **(B)**	10m
Total area of indigenous vegetation to be cleared[1/2] (A x B)	= 478 281m^2

[1]Upon completion vegetated areas that were cleared will be suitably rehabilitated.
[2]For the purpose of the calculation the 10m assumption working corridor has been applied to the entire pipeline route and has not considered transformed areas such as roads and railways.

Due to the location of the study area in relation to the coastal area associated with the Indian Ocean, there are also small portions of the proposed pipeline which fall within 100m of the high watermark of the sea, refer to Table 7 which provides details of the pipelines to be constructed within this 100m zone.

Table 7: Volume Calculations Within 100m Of The High Watermark

The following is applicable:	
Length of pipeline within 100m of the high watermark of the sea **(A)**	2812.12m
Width of trench **(B)**	1m
Depth of trench **(C)**	3m
Total volume of material infilled/excavated within 100m of the high watermark of the sea (A x B x C)	8436.36m^3

It must also be noted that the applicant commenced with the replacement of a 6km section of the pipeline near Bazley Beach, part of the bulk pipeline replacement route, prior to receiving formal approval from EDTEA. Subsequently, EDTEA issued a *Notice of Intent to Issue a Compliance Notice* to Ugu District Municipality. Following consultation with EDTEA, Ugu District Municipality was granted a Section 30A approval for this work on the condition that no other work continues and that rehabilitation of this section be incorporated into the Umdoni South Water Augmentation Project Environmental Management Plan (EMPr). For the purpose of the Environmental Authorization (EA) Application and EMPr, the entire pipeline was evaluated. However, it is important to note that this specific portion of the pipeline will not be included in any subsequent Environmental Authorizations.

Figure 1: Locality Map For Umdoni South Coast Water Pipeline

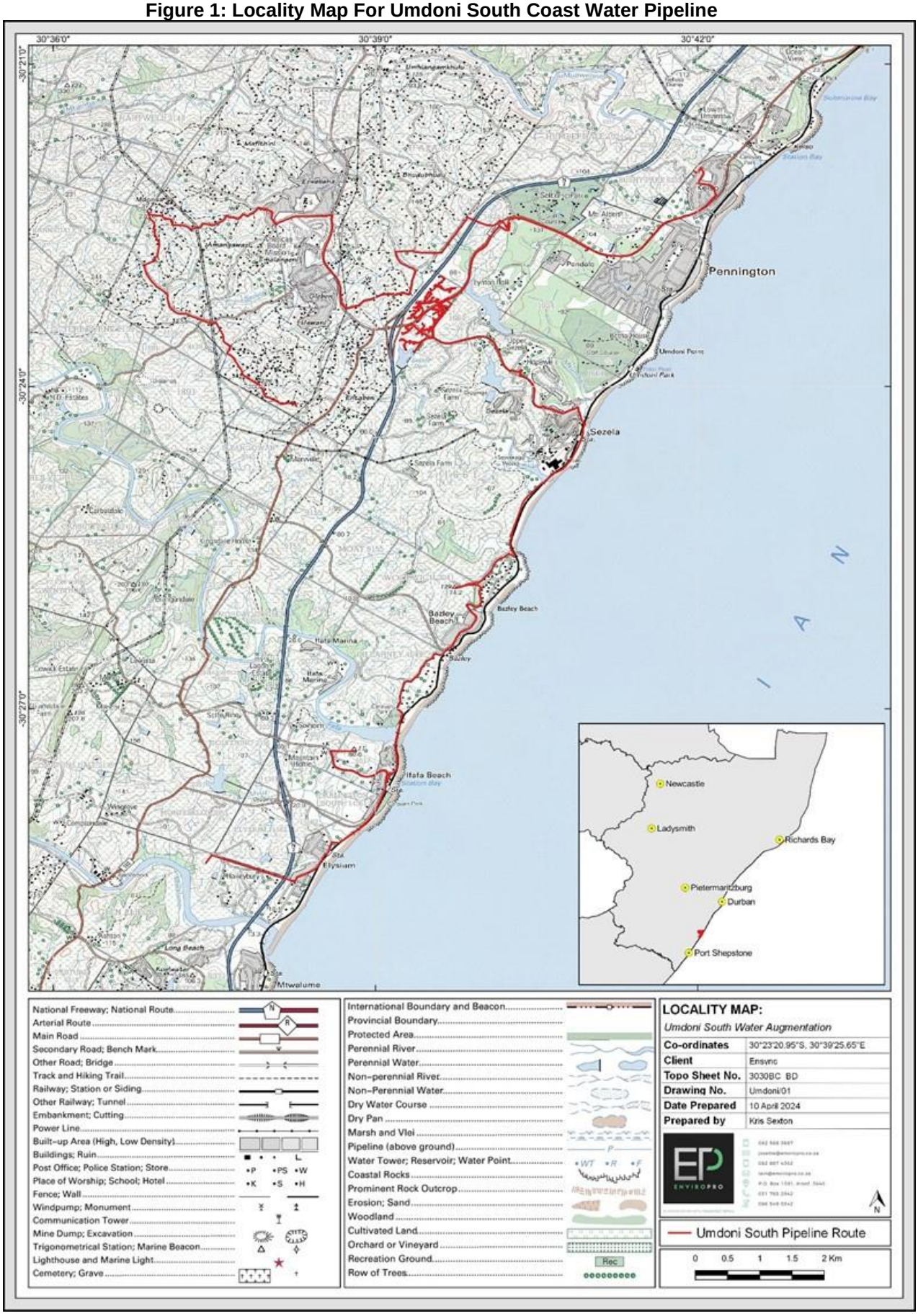
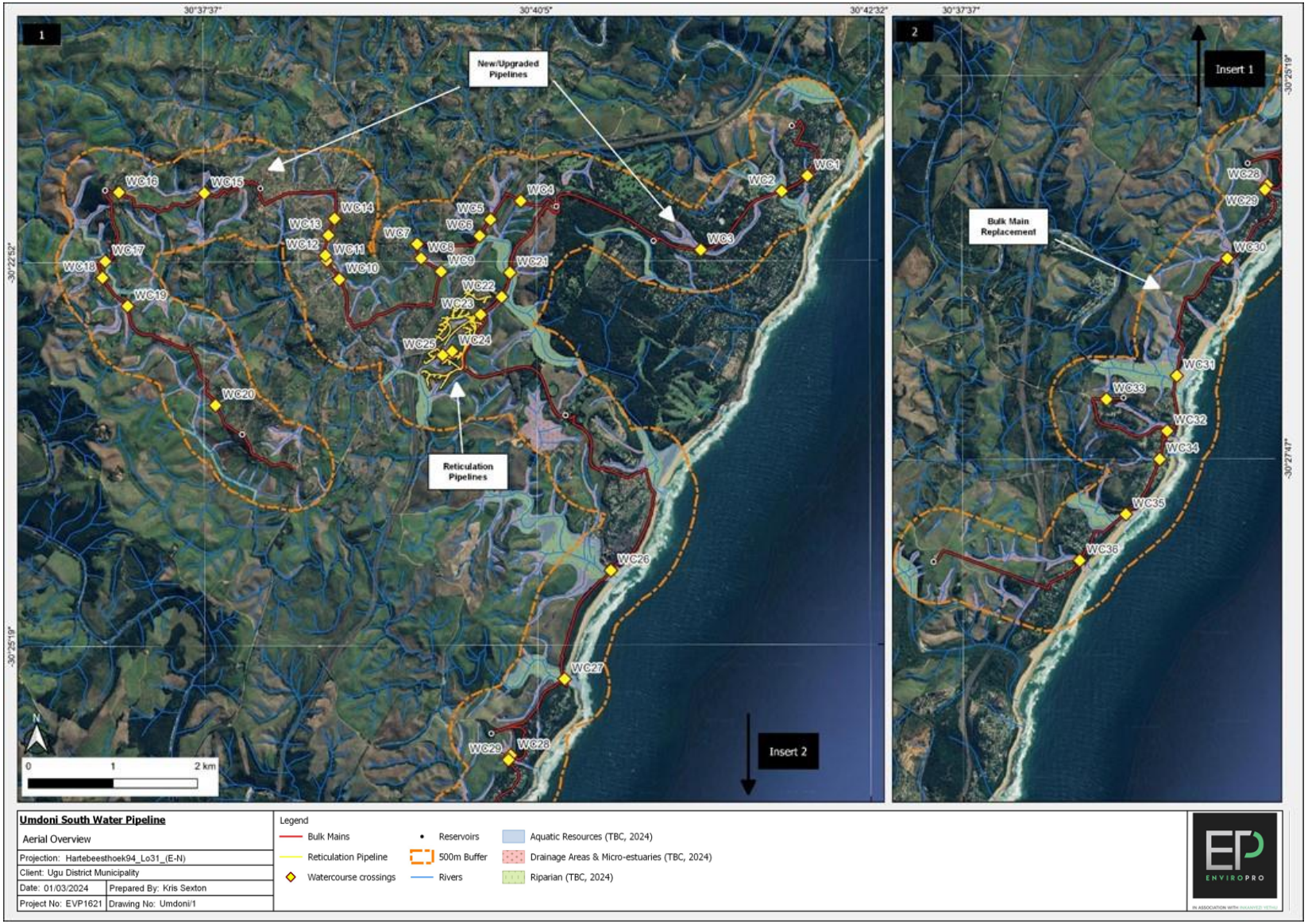


Figure 2: Aerial Photograph showing New and Replacement Pipelines in Umdoni South Water Pipeline



1.10. Table of Responsibilities

This is to state that the undersigned have received a copy of the Environmental Management Plan (EMPr) developed for this site by *EnviroPro* dated March 2024. Any contravention of the EMPr must be recorded, and corrective action must be carried out. Any changes to the EMPr must be approved by the *Environmental Control Officer (ECO)*, the consultant *EnviroPro* and the relevant authority. Such changes are to be made in writing, and a record must be maintained.

The undersigned do hereby agree to abide by the structures of the Environmental Management Plan (EMPr) and accept responsibility for ensuring adherence to the Construction EMPr as it relates to the following areas:

Table of Responsibilities				
Job description/title	**Scope of work or area of responsibility i.e., camp drainage, construction camp, housekeeping etc.**	**Responsible person (Name)**	**Signature**	**Date**

1.11. Names and Telephone Numbers of Contact Persons

The following list of contacts must be printed and made clearly visible on the site.

Contact List			
Designation	**Organisation**	**Name**	**Contact number**
Applicant	Ugu Municipality		
Engineer/Project Manager	Ensync Engineers	Rowen Clark	031 003 0920 | 083 638 7779
Independent Environmental Practitioner and ECO	EnviroPro	Josette Oberholzer Iain Jourdan	031 765 2942
Environmental Authority (Enforcement & Compliance)	EDTEA	Compliance Officer	086 111 2468
Reporting for Incidents involving Watercourses	DWS	Compliance Officer	031 336 2700
Wildlife Related Incident	Ezemvelo KZN Wildlife	Dominic Wieners	033 845 1455
Heritage Resources	AMAFA	Weziwe Tchabalala	033 394 6543
Fire Emergency	Fire Department	-	10111
Crime Emergency	Police	-	10111

SECTION 2: SITE-SPECIFIC IMPACTS AND MITIGATIONS AS IDENTIFIED IN THE BAR

Aspect	Nature and Consequences of impact	Proposed mitigation and Extent to which impact can be reversed/avoided, managed or mitigated:	Person	In place (Yes / No)	Comments
SITE AND DESIGN-SPECIFIC CONSTRUCTION IMPACTS					
A) Clearing and earthworks for the construction of the collector sewer within the delineated watercourses (LN1, Activity 12)	**Direct Impact** 1. Increase in sediment inputs and turbidity in the watercourse.	• Construction work within the watercourse areas must be strictly limited to the construction footprint only. A construction corridor of 10m must be maintained. • Sandbags must be used as a temporary measure around key areas of soil loss to prevent soils from washing into the local watercourse. • Contamination of watercourses with unset cement or cement powder must be negated as it is detrimental to aquatic biota. • All removed soil and material must not be stockpiled within the system.	CON		
	Direct Impact 2. Erosion in the watercourse and loss of material leading to sedimentation and deposition of material downstream of the affected watercourses.	• Construction work within the watercourse areas must be strictly limited to the construction footprint only. A construction corridor of 10m must be maintained. • No areas may be excavated outside of the project footprint. • No soil stockpiles may be placed within 32m of a watercourse. All stockpiles must have sufficient erosion protection measures to ensure sediment is not dislodged as runoff resulting in erosion and sedimentation. • The watercourse area must be rehabilitated as soon as the installation of the pipeline has been completed. • Any exposed earth must be rehabilitated promptly by planting indigenous vegetation (vigorous indigenous grasses) to protect the exposed soil. • Only primary activities related to the water pipeline must be allowed within the watercourse area. All construction activities related to the area must be restricted to have a minimum footprint of disturbance. • Contamination of watercourses with unset cement or cement powder must be negated as it is detrimental to aquatic biota. • All removed soil and material must not be stockpiled within the system. • The contactor must ensure that topsoil is stored and re-applied.	CON		

		• The contractor must make sure that the soil is backfilled and compacted to geotechnical specifications for the project area. • Signs of erosion must be addressed immediately to prevent further erosion.			
	Direct Impact 3. Excavation of the watercourses leading to the alteration of the hydrological regimes	This impact is unavoidable. However, where possible the pipeline and related infrastructure are going to be constructed along the existing road servitudes and will be tied to existing bridge infrastructure. The following measures must be carried out to mitigate thedisturbance of the watercourse area: • Construction work within the watercourse areas must be strictly limited to the construction footprint only. A construction corridor of 10m must be maintained. • The watercourse area must be rehabilitated as soon as the installation of the pipeline has been completed.	CON		
	Cumulative Impact 4. Potential for reduced functionality for the wider watercourse system.	• Construction work within the watercourse areas must be strictly limited to the construction footprint only. A construction corridor of 10m must be maintained. • Sandbags must be used as a temporary measure around key areas of soil loss to prevent soils from washing into the local watercourse. • The watercourse area must be rehabilitated as soon as the installation of the pipeline has been completed. • Any exposed earth must be rehabilitated promptly by planting indigenous vegetation (vigorous indigenous grasses) to protect the exposed soil. • Only primary activities related to the water pipeline must be allowed within the watercourse area. All construction activities related to the area must be restricted to have a minimum footprint of disturbance. • The recommended buffer zones 30m for riparian areas, 20m for drainage line areas, and 60m for EFZ must be strictly adhered to during the construction phase of the project. Any supporting aspects and activities not required to be within the buffer area must adhere to the buffer zone.	CON		
	Cumulative Impact 5. Erosion and loss of material leading to deposition of material downstream affecting other	• Construction work within the watercourse areas must be strictly limited to the construction footprint only. A construction corridor of 10m must be maintained. • Sandbags must be used as a temporary measure around key areas of soil loss to prevent soils from washing into the local watercourse. • The watercourse area must be rehabilitated as soon as the	CON		

	watercourse systems.	installation of the pipeline has been completed. • Any exposed earth must be rehabilitated promptly by planting indigenous vegetation (vigorous indigenous grasses) to protect the exposed soil. • Only primary activities related to the water pipeline must be allowed within the watercourse area. All construction activities related to the area must be restricted to have a minimum footprint of disturbance. • Contamination of watercourses with unset cement or cement powder must be negated as it is detrimental to aquatic biota. • All removed soil and material must not be stockpiled within the system. • The contactor must ensure that topsoil is stored and re-applied. • The contractor must make sure that the soil is backfilled and compacted to geotechnical specifications for the project area. • Signs of erosion must be addressed immediately to prevent further erosion.			
B) Operation of vehicles and use of construction equipment within 32m of the delineated watercourses and surrounding areas during the pipeline construction. (LN1, Activity 19)	**Direct Impact** 6. Degradation of vegetation and surrounding habitat from vehicles and equipment	• There will be construction work required within the watercourse areas as per the layout, however the sensitive areas around the watercourses not within the construction footprint must be demarcated as no-go areas. • The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. • Heavy vehicles must avoid working near the watercourse areas as far as possible. Where heavy vehicles are required to work in the watercourse during the constructionof the pipeline, these vehicles must remain in the authorised pipeline footprint. There must be no haphazard entry into / exit from the watercourse along the route. i.e. construction plants and vehicles may only travel along existing access routes and may only use a single point of entry into and out of the watercourse buffer zone. • The contractor must work to minimize stream-bank disturbance. • Any disturbed areas within the construction footprint must be rehabilitated within a month of occurrence to the satisfaction of the ECO and or EDTEA Compliance Authorities. • All activity within the watercourse must be strictly according to the prescribed engineering designs and approved drawings. • The locations of all infrastructure and services which may be	CON		

		impacted on by the operation of construction plant and related construction activities must be identified and demarcated prior to commencement of construction. • Access to site must make use of the existing access roads. • Heavy vehicles and construction equipment must not impact on the existing. • All construction activity must stay within the predetermined construction footprint and avoid areas with pre-existing infrastructure.			
	Indirect Impact 7. Hazardous substance spills leading to downstream contamination	• All contractors and employees must undergo induction and must have action plans and training material to cater for spills, leaks, and other impacts on the aquatic systems. • All chemicals and toxicants during construction must be stored in bunded areas. • All machinery and equipment must be inspected regularly for faults and possible leaks; these must be serviced off-site.	CON		
	Cumulative Impact 8. Vehicle activity in the watercourse could result in direct and cumulative damage to the watercourse.	• There will be construction work required within the watercourse areas as per the layout, however the sensitive areas around the watercourses not within the construction footprint must be demarcated as no-go areas. • The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. • Heavy vehicles must avoid working near the watercourse areas as far as possible. Where heavy vehicles are required to work in the watercourse during the constructionof the pipeline, these vehicles must remain in the authorised pipeline footprint. There must be no haphazard entry into / exit from the watercourse along the route. i.e. construction plants and vehicles may only travel along existing access routes and may only use a single point of entry into and out of the watercourse buffer zone. • Any disturbed areas within the construction footprint must be rehabilitated within a month of occurrence to the satisfaction of the ECO and or EDTEA Compliance Authorities. • All activity within the watercourse must be strictly according to the prescribed engineering designs and approved drawings. • The locations of all infrastructure and services which may be impacted on by the operation of construction plant and related construction activities must be identified and demarcated prior to commencement of construction.	CON		

		• Access to site must make use of the existing access roads. • Heavy vehicles and construction equipment must not impact on the existing. • All construction activity must stay within the predetermined construction footprint and avoid areas with pre-existing infrastructure.			
C) Earthworks and use of construction equipment within 100m of the high water mark of the sea and near estuarine functional zones (LN1 Activity 19A / LN3 Activity 14)	**Direct Impact** 9. The infilling and excavation of 8436.36m^3 of material during construction resulting in the alteration and degradation of coastal habitats	• The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. • Heavy vehicles must avoid working near the coastal and estuarine habitats as far as possible. Where heavy vehicles are required to work in or near coastal and estuarine habitats during the construction of the pipeline, these vehicles must remain in the authorised pipeline footprint. • All contractors and employees must undergo induction and must have action plans and training material to cater for spills, leaks, and other impacts on the coastal and estuarine habitats. • Any disturbed areas within the construction footprint must be rehabilitated within a month of occurrence to the satisfaction of the ECO and or EDTEA Compliance Authorities. • All activity within the coastal and estuarine habitats must be strictly according to the prescribed engineering designs and approved drawings. • All chemicals and toxicants during construction must be stored in bunded areas. • All machinery and equipment must be inspected regularly for faults and possible leaks; these must be serviced off-site. • The locations of all infrastructure and services which may be impacted on by the operation of construction plant and related construction activities must be identified and demarcated prior to commencement of construction.	CON		
	Direct Impact 10. Installation of 659.88m^2 of pipeline within the estuarine functional zones resulting in the alteration and degradation of estuarine habitats		CON		
D) Clearing of vegetation for the establishment of the working corridor. (LN3, Activity 12)	**Direct Impact** 11. Degradation, destruction and fragmentation of 473741m^3 of the endangered KwaZulu-Natal Coastal Belt	Vegetation clearing must be kept within the construction footprint. Majority of the project area's construction will be within existing road reserves. The impact of vegetation clearing associated with the pipeline crossing is therefore low. This impact cannot be completely mitigated as there will be vegetation loss in areas where there hasn't been previous disturbance. However, the following measures must be carried out to mitigate unnecessary and preventable vegetation clearing and limit the damage:	CON		

	Grassland ecosystem.	• The construction footprint must be 5m wide within the watercourses and 10m wide outside of the watercourses. • The vegetation that will be cleared must be restricted to the construction footprint of the pipelines. No vegetation may be cleared other than that is required for access to the site or for the construction activities associated with the construction of the Umdoni Water Supply Infrastructure. • Contractors must avoid damaging any vegetation that is not within the construction footprint. • All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the Project area to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • The ECO must be consulted should a tree or any vegetation require clearing outside of the designated construction footprint area. • Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already modified areas and must take up the smallest footprint possible. • Areas to be developed/disturbed must be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, must not be fragmented or disturbed further. • All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles. • The clearing of indigenous vegetation must be minimised. All activities must be restricted to within the authorised areas. • A qualified environmental control officer must be on site when activities begin. • A site walk through is recommended by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted.			

		• In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. • Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated. • Any materials may not be stored for extended periods of time and must be removed from the Project Area once the construction phase has been concluded. No permanent construction phase structures must be permitted. Construction buildings must preferably be prefabricated or constructed of reusable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by more alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted. • The Contractor shall be in possession of an emergency spill kit that must always be complete and available on-site. • No servicing of equipment on site unless necessary. • All contaminated soil must be treated *in situ* or removed and placed in containers. • Contain any generator diesel storage tanks, and machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. • All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the Project Area. • It must be made an offence for any staff member to remove any indigenous plant species from the Project Area or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.			

		• All management outcomes and mitigations put forward in the accompanying freshwater report must be strictly adhered to. • All construction waste must be removed from the site at the closure of the construction phase.			
	Direct Impact 12. Disruption/alteration of faunal species activities (breeding, migration, feeding).	The following measures must be carried out to mitigate the excessive and preventable impact on fauna: • Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the Project area and over several days, to provide an easy escape route for all small mammals and herpetofauna. • Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated. • The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna. • Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals. • No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard. Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. • Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. • Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling. • If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence	CON		

		where it is next to a major road as this will increase road killings in the area. • Use environmentally friendly cleaning and dust suppressant products. • A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests. • All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the Project area to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • Rivers, forests and riparian vegetation on and near the project site provide suitable habitats for most fauna on site and must not be unnecessarily disturbed. • Work in rivers, forests and riparian zones must preferably be done during the low-flow season. • All construction vehicles must use designated access roads. Off-road driving is prohibited. • No food or similar waste that may attract wild animals may be disposed of at the site. All food and litter waste must be placed in sealed bins and removed from the site each day. • In order to reduce collisions of vehicles with fauna, animals must have the right of way.			
	Direct Impact 13. Removal of alien invasive vegetation found along the pipeline route.	• This is a positive impact.			
	Indirect Impact 14. Encroachment of alien vegetation into cleared areas.	• An extensive Invasive Alien Plant Programme must be developed and implemented. This should regularly be updated to reflect the annual changed in AIP composition. • All alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be promptly removed.	CON		

		• Herbicides must not be used in or near (within the buffer) watercourses (opt for mechanical removal). • The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths. • A pest control plan must be put in place and implemented; it is • imperative that poisons not be used to control pests. • The areas to be disturbed must be specifically and responsibly • demarcated to prevent the movement of staff or any individual into the • surrounding environments, signs must be put up to enforce this. • Clearing of vegetation must be kept to the construction footprint only. • All denuded areas must be landscaped and revegetated as soon as possible. • Areas that have been cleared of invasive vegetation must be re-vegetated with indigenous pioneer species local to the area. This will aid in impeding the growth of IAPs. These areas must be monitored to ensure vegetation growth.			
E) Construction activity in areas with no vegetated cover.	**Direct Impact** 15. Erosion on exposed banks and areas resulting in scouring and the siltation of the watercourses.	This impact is partially unavoidable as the construction activity will need to take place over cleared exposed areas. The following mitigation measures must, however, be applied: • Exposed banks that are susceptible to erosion must not be left exposed for more than 2 months at any time. • Exposed banks that are susceptible to erosion within 32m of the edge of any watercourse must not be left exposed for more than 1 month at any time. • Erosion/ stormwater protection measures must be implemented above and below the slope in the form of sandbag berms, pack rock berms or even vegetation berms to slow runoff down the slope. • Any accumulated siltation must be removed by spade (by hand). • The planting of dense indigenous pioneer grass seeds across all bare earth area. • Exposed cut and fill slopes near the riparian areas must be top soiled, hydro seeded or have grass sods planted within 4 weeks of being cut.	CON		

F) Handling of hazardous chemicals/substances on-site	**Direct Impact** 16. Spilling of hazardous chemicals/substances into the receiving environment and penetrating into sensitive habitats.	The following measures must be carried out to mitigate potential downstream contamination: • All construction activities must be undertaken during the low flow (dry season) period as much as possible to limit surface flow transporting contaminants to the surrounding watercourse habitat; • All contractors and employees must undergo induction and must have action plans and training material to cater for spills, leaks and other impacts on the aquatic systems; • As much material must be pre-fabricated and then transported to the site to avoid the risks of contamination associated with mixing, pouring and the storage of chemicals and compounds on site; • All chemicals and toxicants during construction must be stored in bunded areas; • All machinery and equipment must be inspected regularly for faults and possible leaks; these must be serviced off-site; • No dumping of construction material on-site may take place; • All waste generated on-site during construction must be adequately managed. • A stormwater management method statement must be compiled for the project by the contractor and implemented during the All stormwater infrastructure must be monitored and maintained addressing areas of non-efficacy;	CON		
G) Sourcing material	**Indirect Impact:** 17. Sourcing material from unlicensed borrow pits and sand mines increases the danger to the surrounding community and is detrimental to the local environment.	Bedding material is often sourced from local quarries or sand mines. The following criteria must be adhered to: • Any local quarry or sand mine used must be a permitted source through DMR. • The contractor excavating the material must do so within the parameters of the mining permit, adhering to the EMP conditions for that particular site.	CON		
H) Excavation for the creation of the pipeline (LN3, Activity 19/19A)	**Direct Impact** 18. Disruption of existing services i.e., powerlines, water pipes etc.	The following measures must be implemented prior to and during excavation along the entire route of the pipeline: • All existing services must be identified and relocated prior to construction.	CON		

	Direct Impact 19. Trench failure due to poor construction techniques.	The following measures must be implemented prior to and during excavation along the entire route of the pipeline: • All earthworks must be carried out in a manner to promotes the stable development of the site. • Earthworks and drainage measures be designed in such a way as to prevent ponding of, or high concentrations of, stormwater or groundwater anywhere on the site and include effective erosion and anti-siltation controls. • Both the geotechnical professional and contractor must carry out regular documented inspections of the trenches in order to detect unstable sidewall conditions during the construction phase. • Workers must not enter or work below any excavations/cuts deeper than 1.5m that are not shored or battered back as described above.	CON		
	Direct Impact 20. Excavations and infilling of trenches leading to the destruction of the natural soil structure	The following measures must be implemented during excavation and infilling along the entire route of the pipeline: • During excavations, the first 300 mm of soil (i.e. topsoil) must be stockpiled separately from the soil excavated deeper than 300 mm	CON		
	Direct Impact 21. Excavations leading to the loss/damage of fossils.	The following measures must be implemented prior to and during excavation along the entire route of the pipeline: • There is a very small chance that fossils may occur in the aeolianites below ground so a Fossil Chance Find Protocol must be added to the EMPr • If fossils are found once excavations have commenced then they must be rescued and a palaeontologist called to assess and collect a representative sample.	CON		
	Direct Impact 22. Excavations leading to the loss/damage of heritage resources.	The following measures must be implemented prior to and during excavations along the entire route of the pipeline: • In the event that any cultural heritage resources are discovered operations exposing archaeological and historical residues, including modern graves, must cease immediately pending an evaluation by the heritage authorities. • A Chance Finds Procedure must be implemented and a qualified archaeologist must be called on-site if cultural heritage resources are found during construction.	CON		

I) The construction period of the Umdoni water pipeline	**Indirect Impact** 23. This is a positive impact on the community through the potential creation of local employment.	• This has a positive impact.			
J) Construction vehicles and personnel working in the area.	**Direct Impact** 24. Creating a nuisance to the surrounding area and residents.	The construction phase of the project will create a level of nuisance to the local community. • The work area must be designated to prevent trespassing onto adjacent properties. • Speed limits will be obeyed and enforced by the contractor. • A complaints register will be kept on-site in the environmental file.	CON		
	Direct Impact 25. Dusty conditions impact air quality affecting community members and fauna along the construction route.	There will be increased dust generated during the construction phase; however, this will be on a temporary basis - i.e., the site will be worked continuously for a few months until construction is completed. Further to this: • The material being transported to the site in the back of the trucks must be covered. • Wetting of exposed soft soil surfaces • No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources • Shade cloth must be utilised for stockpiled materials where required. • The applicant must comply with the National Dust Regulations (Government Notice R827, 2013) with regard to dust levels produced on site.	CON		
	Indirect Impact 26. Impacting existing traffic conditions and pedestrians.	The construction activity will pose an increased risk to pedestrians and traffic. This cannot be avoided as traffic will increase during the construction phase temporarily until construction is completed. • Construction safety signage must be erected to notify of construction activities and potential hazards on site • Flagmen must be in attendance to direct traffic where required.	CON		
	Direct Impact 27. Improper storage of waste on-site resulting in littering and impact on the	The construction phase of the project will see an increase in workers on-site and therefore an increase in waste in the area. • Littering will not be permitted in the project area. • Designated waste storage areas with waste receptacles must be set up within the construction site camp.	CON		

	environment on-site affecting the surrounding community.	• Waste will be removed from the site and disposed of at a registered waste disposal site. • Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site. • Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible. • Safe disposal slips for the disposal of all waste must be obtained and kept on-site as proof of safe disposal. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least. Where a registered disposal facility is not available close to the PAOI, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried on open pits. • Waste management will be controlled through the implementation of the EMPr. This impact can be managed and mitigated.			
	Indirect Impact 28. Emissions from construction vehicles associated with the construction activities.	The construction phase of the project will see an increase in vehicles moving through the area which will result in the increase of emissions into the atmosphere. • All construction vehicles operating on the site must be fitted with the appropriate silencers and exhausts in order to reduce emissions and noise into the atmosphere.			
	Direct Impact 29. Insufficient number of toilet facilities on site resulting in construction staff having to use the surrounding areas as ablutions, resulting in contamination of the environment.	The increase in construction personnel during the construction phase will require a number of toilet facilities for the site. Toilets at the recommended Health and Safety standards must be provided. • Sufficient toilet facilities (1 toilet per 15 employees) must be provided by the Contractor. • All toilet facilities must be checked on a daily basis • All toilet facilities must be emptied and cleaned on a weekly basis. • Once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site.	CON		

	Indirect Impact 30. Inappropriate disposal of toilet waste resulting in the contamination of the environment.	The following mitigation measures must be adhered to: • All toilet facilities on site utilised by the construction personnel must be checked on a daily basis and emptied on a weekly basis by the contactor • A registered waste removal contractor must remove sewage waste from site or sewage waste must be disposed of at a permitted Waste Water Treatment Site. • Once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site. • Safe disposal slips for the disposal of effluent waste must be obtained and kept on-site as proof of safe disposal.	CON		
K) Rehabilitation taking place along the water pipeline working servitude.	**Direct Impact** 31. Inappropriate rehabilitation leading to long-term environmental degradation	The following mitigation measures must be adhered to: • Re-vegetation of the disturbed site must aim at approximating as near as possible the natural vegetative conditions prevailing prior to construction. • Bare surfaces must be grassed as soon as possible after construction to minimise time of exposure. the planting of dense indigenous pioneer grass seeds across all bare earth areas. • Take remedial action where vegetation establishment is unsuccessful or erosion is evident. • As much vegetation growth as possible must be promoted within the study area in order to protect soils and to reduce the percentage of the surface area which is left bare ground. • Rehabilitation of all disturbed areas must be an ongoing process and areas must be rehabilitated as soon as construction is completed in that area (i.e. rehabilitation of the whole route is not only undertaken once all construction is completed, but rather in incremental sections as construction progresses. • All areas to be affected by the project activities must be rehabilitated by indigenous vegetation. • Indigenous plants naturally growing within the project area, but that would be otherwise destroyed during clearing for development purposes, must be incorporated into rehabilitation areas. • When rehabilitating the construction footprint site, it is imperative that as far as possible the habitat that was present prior to disturbances is recreated or improved, so that faunal species that were displaced by vegetation clearing and	CON		

		construction activities are able to recolonize the rehabilitated area. • The plant material to be used for rehabilitation must be similar to what is found in the surrounding area. • Immediate rehabilitation of any areas disturbed as a result of construction activities. Use species that are specific to the original vegetation type of the affected area (ensure to keep topsoil separate). • A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas.			
SITE AND DESIGN-SPECIFIC OPERATIONAL IMPACTS					
L) Operation of the Umdoni Water Pipeline	**Direct Impact** 32. Improved supply of potable water and service delivery into the surrounding areas.	• This is a positive impact.			
	Indirect Impact 33. Erosion caused by unplanned pipe leaks	Precautions to be taken include: • The installation of leak warning and detection systems • The planting of dense indigenous pioneer grass seeds across all bare earth areas. • Monitoring of the pipeline must be undertaken to detect leaks and monitoring should be undertaken at least once a week.	APP		
	Cumulative Impact 34. Constructing the pipeline will be a positive operational impact. The community will benefit from the supply of potable water.	• This is a positive impact.			
	Indirect Impact 35. Indirect Impact: Illegal connections leading to damage to the pipework, flooding, erosion	• Since most of the households in the area will have easy access to water, there are unlikely to be illegal connections. However, the pipeline will be laid in trenches, except for across the watercourses. The water service provider must monitor the pipeline through routine inspections with any leaks being repaired as soon as they are reported.	APP		

	and loss of water supply				
M) Placement of the pipelines • **Incomplete trenching and rehabilitation of the site** • **Improper placement of pipes**	**Direct Impact** 36. Long-term erosion around watercourses and damage to watercourse banks where the pipeline has been placed.	The following measures must be carried out to mitigate long-term erosion: • Trench rehabilitation must be effectively carried out before contractors leave the site. • The soil in the trenches must be compacted effectively to the same level or slightly higher than the surrounding land to prevent settling which could create depressions for water to travel along, creating erosion funnels and exposing the pipeline. • Indigenous vegetation must be planted after the soil has been compacted. The vegetation must have been taken successfully before contractors leave the site. • Regular monitoring for erosion after construction must take place to ensure that no erosion problems have developed as a result of the disturbance. • All erosion problems observed should be rectified as soon as possible.	APP		

SECTION 3: STANDARD CONSTRUCTION MITIGATION MEASURES

3.1. Site Camp, Storage & Handling of Hazardous and Non-Hazardous Materials & Stockpiling				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Location & Establishment of the construction camp	• The construction camps must be marked out with the approval of the ECO.	CON		
	• The site camps must be located on a flat transformed portion of land. • Do not set up construction camps within 30m of any other watercourse.	CON		
	• The site camps must be demarcated and fenced off to prevent illegal entry.	CON		
	• The following areas must be demarcated and marked within the construction camps: ○ **A waste storage area** ○ **A materials storage area** ○ **Areas for fuel and hazardous chemical / flammable goods** ○ **Stockpile areas** ○ **Vehicle servicing and wash bay areas (if required)** ○ **Parking area** • Access to site must make use of the existing access track. • Heavy vehicles and construction equipment must not impact on the functioning of the existing irrigation scheme. ○ If damage occurs to the irrigation scheme and farming projects, remediation must occur immediately.	CON		
Establishing storage areas & Stockpiles	• **A waste storage area** must be demarcated, and waste bins must be provided within the camps. Storage of waste must be on a hard surface, and undercover. Liquid waste must be situated within a bunded area. ○ Liquid waste and accumulated waste must be removed from the site monthly by a recognised Waste Contractor.	CON		

	○ Proof of safe disposal of such liquid waste must be kept on site and be provided upon request by Competent Authority (henceforth CA).			
	• **A materials storage area** must be identified and designated within the construction camps. Materials, specifically liquid and potentially environmentally hazardous materials must be stored within a bunded area (110% capacity of the largest container) and on a hard surface. The storage area must be undercover.	CON		
	• **Areas for fuel and hazardous chemical / flammable goods** must be identified and signposted within the construction camps. An inventory of the materials and volumes stored must be maintained and updated once a week. These areas must be located within a bunded, hard-surfaced impermeable area.	CON		
	• **Bulk fuel storage:** No bulk fuel storage to occur on any of the sites.	CON		
	• **Designated areas for stockpiling of raw materials** must be demarcated within the construction camps. No stockpiling is to occur on or near slopes where they could be washed into the surrounding properties or the rivers. All stockpiling areas must be approved by ECO.	CON		
	• **Parking:** The contractor must designate parking areas on the sites and ensure that only these parking areas are used. • Vehicles must not park within 30m of any watercourse.	CON		
	• **Vehicle servicing and washing:** only emergency (breakdown where equipment is no longer mobile) and minor maintenance (e.g. greasing) may be done on the sites. ○ A designated area must be set aside for this, which must be hard-surfaced and bunded. ○ If emergency repairs are required, this must not be conducted within 30m of any watercourse, riparian zone or wet area. ○ Drip trays must be used. ○ Any other planned or required maintenance must be done off-site at a suitable location. ○ Vehicle washing must also be conducted off-site at a designated vehicle wash bay, the wash bay must be lined with an	CON		

	impermeable material and must drain to a sump to ensure hydrocarbons, and other contaminants are separated before remaining runoff being discharged into the municipal sewer. ○ No cement vehicles may be washed on site.			
Handling of liquids on site	• Decanting of any liquids/chemicals paints etc. must be done within the confines of a drip tray or on a hardened surface within a bunded area. • This must not be carried out within 30m of any watercourse.	CON		
	• Decanting from large containers (e.g. 210L drums) must be done using a hand pump, where possible. If no hand pump is available, liquids must be decanted on a drip tray using a funnel.	CON		
	• All handling of hazardous materials, including cement, must take place on a hardened surface or within a drip tray or cement mixing tray. • This must not be carried out within 30m of any watercourse.	CON		
	• Decanting of hazardous materials must take place within the site camp above drip trays or containers to prevent the potential spillage into these areas. • This must not be carried out within 30m of any watercourse.	CON		
Inventory and record of substances stored on site	• A full inventory of hazardous substances and Material Safety Data Sheet (MSDS) for each substance stored on site must be maintained, and each substance must be stored and managed per the MSDS.	CON		
Storage of hazardous materials	• Hazardous materials and liquids to be stored in the assigned storage area as per Section 3.0 of this EMPr.	CON		

3.2. Administration & Records				
Activity / Document	**Required Action**	**Person**	**In place (Yes / No)**	**Comments**
Site-Specific EMPr	• Keep a hard copy of the Site-Specific EMPr on-site and ensure that it has been signed and received by the contractor and engineer. • Keep a hard copy of the Environmental Authorisation on-site and it must be made available on demand by the Competent Authority.	CON		

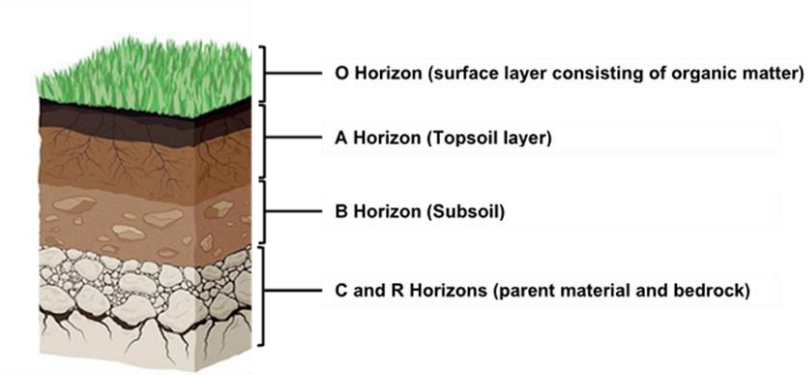
	• All contractors, the engineers and the ECO must have a copy of the EMPr before coming on to the site.	ECO/ ENG		
Records	• Keep records and proofs of all agreements, meetings etc. to demonstrate compliance with this EMPr.	CON		
Proof of raw material sourcing and resource use	• Proof of sustainable source of all materials used must be obtained and documented, especially for raw material i.e. topsoil, sands, natural gravels, crushed stone, clay liners, timber etc. <u>In other words, documented proof that materials have been sustainably sourced must be maintained on-site for review by EDTEA</u>. ○ E.g., sand may only be obtained from approved sand winning operations, which is licensed by the Department of Mineral Resources (DMR) and has an approved EMPr for operation. ○ Where materials are borrowed (mined), proof must be provided of authorisation to utilise these materials from the landowner/mineral rights owner and the Department of Minerals and Energy.	CON/ EO		
Water abstraction for dust suppression	• Water used on site must be obtained from a municipal source.	CON/ EO		
Proof of training	• Keep training attendance registers, training manuals and assessment material (where applicable) on file at all times. • These documents must be made available to the Competent Authority on demand.	EO		
Incident records & Photographs	• Keep records of incidents that have occurred and how they were remediated. It is a good idea to take photographs when incidents occur and then to take follow up pictures to demonstrate remediation and keep these on record. • These records must be kept on-site for review by EDTEA.	EO		
Appointment of ECO / EO	• Appoint an ECO (Environmental Control Officer) before commencement of construction to monitor the entire construction phase.	ENG		
	• Keep proof of appointment and contact details as well as dates of audits. • The appointment letter must be communicated with the CA's Compliance Monitoring and Enforcement section **prior** to commencement of activity.	APP		

Emergency response plan	• An emergency response plan must remain on-site as must a copy of the EMPr and the Environmental Authorization.	ECO		
Audits	• A record of audits conducted on the site as well as findings must be kept on site.	CON/ EO		
Permits & Approvals	• Keep all necessary permits and approvals on file, i.e. construction licences etc. • These must be kept on-site for review by EDTEA.	CON		
MSDSs	• Material Safety Data Sheets (MSDSs) are to be kept on-site for all hazardous materials.	CON		

3.3. Training & Awareness				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Who should be trained & Frequency of training	• All construction staff must have basic environmental awareness training, which can be conducted at the same time as the required health & safety training.	EO		
	• Staff must be trained on their environmental responsibilities before commencing work and refresher sessions can be conducted during toolbox talks on specific areas causing problems.	EO		
	• Staff must sign a training register and Records of training must be kept. • These records must be maintained on-site for review by EDTEA. • Keep training attendance registers, training manuals and assessment material (where applicable) on file at all times.	EO		
Training Content and staff conduct	• Training must include 1. The definition of environment (people + air + soil + water +business); 2. Reasons for conserving and protecting the environment; 3. How the following activities can impact the environment: - Not using assigned ablutions, hazardous materials, uncleaned spills, mixing of cement or paint on soil or grass surfaces, waste management, i.e. use of waste receptacles and waste	EO		

	separation for recycling, vehicle washing polluting soil & groundwater; litter; 4. What to do to prevent the above impacting the environment i.e. assign impermeable mixing areas, no vehicle washing on-site, use of waste receptacles and separation of waste to allow for recycling, how to respond in an emergency and deal with a spill; 5. Consideration of neighbours. 6. Do not play music or create any other disturbance to neighbours. 7. Use only the chemical toilets provided. 8. No dumping to occur in sensitive areas on site. 9. Use waste bins provided. 10. Use drip trays provided. 11. Do not build fires for any purpose on the site. 12. Behave in a socially acceptable manner and do not use drugs or alcohol on site. 13. There is to be no hunting of wildlife on the site and no setting of snares or traps. No animals are to be harmed or harassed.			
Neighbours & Working hours	• Local community members must be notified of the project through community leaders and must be notified of the existence of any hazardous storage areas as well as the type of chemicals being used on site. This can be achieved through the placement of signboards. • Proof of notice of local community members (Correspondence/Minutes/Attendance Register) must be kept onsite and be provided upon request by the CA.	CON		
	• Limit hours of operation to weekdays 7-5pm and Saturday mornings 7 - 12 pm. Neighbours to be notified before construction on weekends takes place.	CON		
	• Advise the adjoining neighbours of the work and hours of work at least one week before commencement. This can also be indicated on the signboards.	CON		
	• Neighbours to be advised before periods where work will be done outside normal working hours.	CON		

3.4. Sensitive Social Areas, Environmental Areas, Vegetation and Vegetation Clearing and Wildlife				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Community	• The surrounding stakeholders must be made aware of the commencement of construction 30 days before construction. Alternate temporary access routes must be determined before the commencement of the construction.	CON		
Topsoil	• Topsoil removed during the excavations must be kept to one side • During excavations the first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm; and • Soil stockpiles must not exceed 2m in height, must be covered, or grassed to prevent erosion caused by exposure to heavy wind or rain.	CON/ EO		
Backfilling trenches	Care must be taken to ensure that when closing trenches, soil is compacted sufficiently and left so that the level of the trench is slightly higher than the surrounding land, to allow settling. Should soil settle below the level of the surrounding land, it will leave a depression along which water will travel and this could create a focal point for erosion. This can occur on sloped sections where water will follow the depression along the pipeline route, building up speed down steeper sections and creating furrows. If this occurs near watercourses, it will erode the river banks and cause them to collapse. Rehabilitation through replanting of indigenous grass species soon after closure will aid in stabilising soil and preventing erosion and will also assist in dust control. **Backfilling of incorrect soil horizons:** depending on the depth of each soil horizon, the top soil (approximately 5 -20cm depth) must be separated from deeper horizons during trench excavation activities. This will involve the excavation and stockpiling of different soil types (see Figure below) into separate piles on either side of the trench (to prevent soil type mixing). Each stockpile (i.e. each Horizon) must be placed back into the trench in the order it was excavated, i.e. start with bottom layer and finish with the topsoil layer. This must be conducted in order to	CON/EO		

	retain the nutrient composition within the topsoil layer (required for the growth of plant species characteristic of the ecosystem type) once the trench has been backfilled. This will result in the efficient and effective rehabilitation of excavated, and subsequently backfilled, pipeline trenches.  			
Vegetation clearing and planting	• Only vegetation within the development footprint may be cleared. Any vegetation clearing must be done under the supervision of the ECO and Engineer. • Permits must be obtained from Ezemvelo KZN Wildlife and The Department of Environment, Forestry and Fisheries if any protected species are to be relocated and/or removed. • A progressive rehabilitation must be developed and implemented. • No non-indigenous garden variety plants must be used. • Prior to clearance of vegetation, a walkdown must be conducted by a suitably qualified specialist to identify and record the protected species that will be impacted by the development. The necessary permits must be applied for prior to commencement on site.	CON/ EO		
Alien vegetation control	• On-going control of alien vegetation within the construction area must be maintained.	CON/ EO		
	• An extensive Invasive Alien Plant Programme must be developed and implemented.	CON/ EO		

Cultural and Heritage items	The following Chance Find Procedure is to be executed in the event that archaeological material is discovered: • All construction activity in the vicinity of the accidental find/feature/site must cease immediately to avoid further damage to the site. • Briefly note the type of archaeological materials you think you've encountered, its location, and if possible, the depth below surface of the find. • Report your discovery to your supervisor or if they are unavailable, report to the project Environmental Control Officer (ECO) who will provide further instructions. • If the supervisor is not available, notify the ECO immediately. The ECO will then report the find to the Manager who will promptly notify the project archaeologist and SAHRA. • Delineate the discovered find/ feature/ site and provide a 25m buffer zone from all sides of the find.	CON		
Paleontological Monitoring Programme	• The Monitoring Programme for Palaeontology must commence once construction activities begin. - The following procedure is only required if fossils are seen on the surface and when excavations commence. - When excavations begin, the rocks must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (wood, plants, insects, bone, coal) must be put aside in a suitably protected place. This way, the project activities will not be interrupted. - Photographs of similar fossil plants must be provided to the developer to assist in recognising the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures. - Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment. - If there is any possible fossil material found by the developer/environmental officer, then the qualified palaeontologist sub-contracted for this project must visit the site to inspect the selected material and check the dumps where feasible.	CON/ EO		

	- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site, a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits. - If no good fossil material is recovered, then the site inspections by the palaeontologist will not be necessary. - If no fossils are found and the excavations have finished, then no further monitoring is required.			

3.5. Soil, Stormwater Runoff; Erosion				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Stormwater system	• Temporary stormwater protection measures must be established before construction activities commence.	CON		
	• No contaminated runoff or greywater is allowed to be discharged from the Site Camps into any watercourse or surrounding environment.	CON		
	• Stormwater must not be allowed to flow into surrounding properties and must enter existing stormwater channels.	CON		
Stormwater Quality	• Only clean stormwater may be diverted to a watercourse however precautions must be in place to prevent erosion of the riverbanks. These precautions can include gabion baskets, berms or diversion ditches, sandbags	CON		
	• Washings from any vessels or any containers must not enter the watercourse. These washings are to be contained and removed as waste.	CON		
Incidents	• The entry of any substance (i.e. any material or substance that is not clean stormwater) into the stormwater or a water body is considered an incident and must be reported to the ECO	CON/ EO		

	immediately for the purposes of maintaining the site's incident records.			
Stormwater flow	• The drainage system must be regularly checked to ensure unobstructed water flow.	CON		
Erosion Control	• Install erosion barriers (gabion baskets, berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric) before clearing in order to prevent substances from entering exposed drains or channels.	CON		
	• Identify any steeper areas where erosion is more likely to occur. These areas must be protected from erosion. This can be achieved through the planting of vegetation, placement of berms or use of hessian material.	CON/ EO		
	• Regularly check and clean material from behind erosion barriers.	CON/ EO		
	• Sediment/soil must not be permitted to enter the watercourses. The contractor must install erosion barriers (gabion baskets, berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric).	CON/ EO		

3.6. Housekeeping, Waste Storage Handling and Disposal				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
General Waste Storage	• The waste area to be designated and demarcated within the construction camp (as per section 3).	CON		
	• Solid waste must be stored in covered, tip-proof metal drums to be collected and disposed of by a certified waste contractor. • Proof of safe disposal of solid waste must be documented, and these records must be maintained on-site for review by EDTEA.	CON		
Hazardous waste	• Hazardous materials that require disposal (cement, paints, solvents, old fuel/oil etc.) must be disposed of at a registered hazardous landfill site.	CON		

	• These materials must be removed by a hazardous waste contractor. Proof of disposal must be available to the ECO for scrutiny and kept on record. • Proof of safe disposal of solid waste must be documented, and these records must be maintained on-site for review by EDTEA.	CON		
Waste from Chemical toilets	• Install chemical toilets and ensure disposal of waste at a licenced disposal facility. Proof of disposal must be kept on-site at all times.	CON		
	• Waste from the toilets must be collected weekly by a registered and reputable company.	CON		
	• Safe disposal certificates for toilet waste must be obtained and kept on-site as assurance that the waste was properly disposed of.	CON		
	• Toilets must not be situated on slopes or within 40m of any watercourse and must be secured to prevent them from tipping over.	CON		
	• Staff must use facilities provided and are not permitted to use any other areas on-site as toilet facilities.	CON		
	• Chemical toilets must be checked daily and cleaned.	CON		
Waste storage and handling	• No waste may be buried or burned on-site or dumped on surrounding properties and farmland. All waste must be disposed of at a licences waste disposal facility. Proof of disposal must be kept on-site at all times.	CON		
	• All skips must be covered to contain odours and prevent waste from blowing around the site.	CON		
	• A register of all waste generated and disposed of must be maintained.	CON/EO		
	• No dumping is permitted. There must be no dumping on site under any circumstances. The contractor is liable to a fine should there be any evidence of illegal dumping. • The ECO to review the damage and advise on rehabilitation measures if required.	CON		

	• Do not place waste containers, skip bins or building materials on steep slopes or within 20m of the stream.	CON/EO		
	• Waste accumulated on-site must be removed weekly. The waste must be moved to a licenced waste disposal facility.	CON		
	• Provide litter bins throughout the site for use by all staff on site.	CON		
Waste separation	• **Hazardous:** Hazardous waste must be stored separately from general waste. ○ Hazardous waste must be disposed of at an approved hazardous waste landfill, and safe disposal certificates must be obtained. ○ Hazardous waste includes used oils, lubricants, solvents, solvent-based paints, concrete waste, and cement.	CON/EO		
	• **Oils** must be within a bunded storage area and treated as flammable waste. ○ Where possible used oils must be recycled. ○ Safe disposal certificates must be kept on-site demonstrating disposal or recycling of the used oils. ○ Solid paint waste may be disposed of as general waste.	CON/EO		
	• **Concrete waste:** ○ Return excess concrete with the delivery truck to the supplier for recycling or proper disposal. ○ Any other excess concrete, i.e. on-site mixed concrete, can be stored in a lined bin for eventual recycling or disposal.	CON/EO		

3.7. Noise				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Noise Generation and suppression	• All construction vehicles must be fitted with standard silencers and be well maintained.	CON		

	• Workers must be trained regarding noise on-site, and construction hours must be kept to working hours (07h00 to 17h00).	CON		

3.8. Dust & Emissions				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Dust from stockpiles	• Cover any stockpiled fine material that may release dust with plastic.	CON		
Dust from surfaces	• Damp down surfaces and stockpiles as required to reduce windblown dust.	CON		
	• A water cart may be used which must remain on designated roadways if required.	CON		
	• If dust from the site is likely to create problems for nearby residents, these areas must be shielded with shade cloth.	CON		

3.9. Vehicle Maintenance, Operation, Driving On-Site and Vehicle Washing				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Access points	• Haulage roads must be demarcated at the site set up.	CON		
	• Turning areas must be located within the construction footprint and must be designated.	CON/ EO		
	• Temporary access roads must not be located within adjoining properties.	CON/ EO		
	• No ad hoc haulage roads or turning areas may be created.	CON/ EO		

	• Limit vehicle entry point to the designated access point and ensure no other point of entry is used.	CON/ EO		
	• All vehicles to remain in the parking area designated within the construction site.	CON/ EO		
Vehicle Servicing and repairs	• No major equipment or vehicle servicing to occur on-site, i.e. major disassembly and repair work, clutch replacements and oil or lubricant changes must be carried out at a suitably equipped workshop.	CON		
	• Only minor emergency repairs, i.e. those necessary to get the vehicle moving so that it can be taken to a repair facility to be carried out, i.e. stopping of oil leaks, lubricating of hydraulics, changing of buckets/breakers on Excavators and TLBs or changing of tyres. This must be carried out in designated workshop areas within the allowed construction camps. These areas to be hard-surfaced and bunded.	CON		
	• Drip trays are to be used by all leaking vehicles and equipment.	CON/ EO		
	• All vehicles to be equipped with drip trays.	CON/ EO		
	• All small machinery used on site must be situated on a drip tray (i.e. pumps, generators, compressors etc.).	CON/ EO		
	• All vehicles to be regularly maintained and maintenance records must be made available on request.	CON/ EO		
	• No leaking vehicles to be allowed on site.	CON/ EO		
	• Any vehicles that are leaking must not be allowed entry to the site.	CON/ EO		
	• No vehicles to be washed on-site - cement trucks are not permitted to wash out cement mixers on site.	CON/ EO		

	• Only emergency (breakdown where equipment is no longer mobile) and minor maintenance (e.g. greasing) may be done on-site. Any other planned or required maintenance must be done offsite.	CON		

3.10. Incidents, Spills and Emergency Response				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Spill kits	• Adequate spill kits and containers for spilt and contaminated material to be on standby on site.	CON/EO		
	• Keep marked booms and/or absorbent material on-site to contain spills if they occur.	CON/ EO		
	• All staff must be trained on how to react in the case of an emergency.	CON-SHE		
	• If a spill occurs, stop the source, contain it, clean up as per MSDSs and notify relevant authorities.	CON/ EO		
	• Make staff aware of emergency phone numbers to use in the case of a large spill.	CON/ EO		
Definition of incidents	• All incidents are to be recorded.	CON/ EO		
	• **Minor incidents**: small spills less than 5 l that do not enter stormwater or the stream/river, minor non-compliance with EMPr that does not cause major environmental impact, i.e. housekeeping issues etc. ○ **Action:** Supervisor and staff on-site to record and address and notify ECO. Take photos of the spill. Prevent spill from spreading and contain. Collect spilt material and contaminated soil and place in a sealed container for disposal. ECO to advise on remediation measures and to follow up on actions taken to address the incident.	CON/ EO		

	○ **Records:** On-site incident register.			
	• **Major incidents:** Large spills or any spills that enter stormwater or the stream/river, fires, explosions. Please see the definition of a reportable incident provided below. ○ **Action:** Report immediately to ECO, action to be taken to prevent further damage and incident to be reported to authorities. ECO to advise on remediation measures and to follow up on actions taken to address the incident. ○ **Records:** On-site incident register and report to authorities.	CON/ EO		

3.11. Sewage and Grey Water Management				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Sewage	• Adequate toilet facilities (such as chemical toilets) sufficient in number to cater for the number of staff on-site must be provided. One toilet per 15 staff must be provided.	CON		
	• Waste must be managed as per section 3.5, namely removed by a licensed contractor, and safe disposal certificates retained to prove proper disposal. • Safe disposal certificates must be kept on-site for review by the EDTEA.	CON/ EO		
Greywater/wash water	• Greywater must not be permitted to enter the surrounding properties or stormwater.	CON/ EO		
	• Vehicles, especially cement trucks, must not be washed on site these must be washed at a wash bay facility off-site.	CON/ EO		
	• Alternately the wash water can be collected and returned with the supplier's truck for disposal by the supplier.	CON/ EO		

SECTION 4: POST CONSTRUCTION, REHABILITATION AND OPERATION

4.1. Post Construction Activities

Activity	Required Action / remediation to control environmental impact	Person	In place (Yes / No)	Comments
Post Construction Audit	• Clearance from the ECO must be obtained to ensure the all of the requirements of the EMPr have been complied with. • Clearance **must be obtained from the CA prior** to the contractor leaving the construction site.	ECO		
Stormwater	• The Contractor must check that the stormwater channels are free from building rubble, spoil materials, and waste materials.	CON		
	• Ensure that in the long term; stormwater is protected from ingress by potential pollutants.	CON		
Waste & Spills	• All spillages must be cleaned and contaminated soil must be removed and disposed of.	CON/ EO		
	• All remaining waste bins and/or skips must be removed and disposed of. Records of disposal must be retained.	CON/ EO		
	• All excess concrete must be removed from the site on completion of works and disposed of. Washing of the excess into the ground is not allowed.	CON/ EO		
	• All excess aggregate must also be removed.	CON		
	• Used oil must have been collected by a registered used oil contractor and documentation to this effect provided.	CON		
	• Surfaces are to be checked for waste products from activities such as concreting are cleared in a manner approved by the ECO.	CON		

	• No litter must be left on site.	CON/EO		
Structures, materials and stockpiles	• Any fences, barriers, or demarcations utilised for the construction phase must be removed and disposed of.	CON		
	• All structures and imported materials within the construction camp must be removed.	CON		
	• The remaining building materials must be removed from the site.	CON		
Damage	• Any damage incurred on the neighbouring homesteads by the contractor must be repaired by the contractor.	CON		
	• Any damage to existing infrastructure must be repaired or replaced on completion of the upgrade.	CON		
Close Out	• A meeting must be held between Engineer, the ECO, and the contractor to approve all remediation activities and ensure that the site has been restored to a condition, which has been approved by the Engineer.	ENG		
Vegetation	• All vegetation planting must be completed and any areas that have been disturbed or cleared must have been rehabilitated and revegetated as per the Rehabilitation Plan	ECO		
	• Re-vegetation of cleared land must utilise only 100% locally indigenous plant material to ensure no erosion occurs once the site is vacated.	CON/EO		
	• Ensure that no sensitive habitats have been damaged during the construction phase.	ECO		
	• Where habitats have been damaged, these must be reported to the ECO and procedures for rehabilitation of these habitats must be undertaken.	CON/EO		
Erosion	• Any eroded soil on paths/roadways/ other areas must be collected and replaced in the area from which it was eroded. These high-risk erosion areas must be protected from further soil erosion.	CON/EO		

4.2. Rehabilitation				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Rehabilitation of the site	• Cleared areas to be re-grassed on completion. Indigenous grasses to be used and the use of vetiver or kukuyu grass is not supported. Rather an indigenous grass seed mix must be used to rehabilitate the site. Species within this mix should include *Urochloa panicoides* (Garden Signal Grass), *Pogonarthria squarrosa* (Herringbone grass), *Eragrotis curvula* (Weeping Love Grass) and *Chloris gayana* (Rhodes Grass). • Where possible, vegetation that was removed during clearing must be kept aside and re-used. This can be kept on-site in nursery areas or if the replanting occurs within a few days of clearing, can be kept to one side and immediately re-planted. • Grass can be reintroduced by Hydroseeding or planting of grass plugs. • Cleared areas must not be left exposed for periods longer than two weeks and must be revegetated in stages as each section is completed. • Where serious habitat damage has taken the damaged must be reported to the ECO. Consultation between the ECO, contractor, and engineer must take place. Whereby the contractor must develop an method statement which must focus on the rehabilitation of the damaged area. This method statement must be approved by both the ECO and engineer. The contractor must then implement this method statement under the supervision of the ECO.	CON/ EO		
Top Soil	• Topsoil removed during the excavations must be kept to one side (stored more than 22m from all watercourses) and re-used in the same area that it was excavated from. Much of this topsoil, especially the top 30cm will retain grass and vegetation seeds. • This topsoil to be used when re-vegetating and rehabilitating areas cleared for construction/ excavation.	CON/ EO		

Rehabilitation of eroded areas	• Any erosion damage caused during construction must be repaired. The affected area must be reshaped, and the soil replaced. • The eroded area must be re-vegetated or measures put in place to control further erosion. The contractor must install erosion barriers (gabion baskets, berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric).	CON/ EO		
Removal of alien invasive plants	• Alien invasive species must be removed on an on-going basis as per the Invasive Alien Plant Programme. • Use of chemical pesticides must be avoided, and mechanical removal by hand is preferred.	CON/ EO		

4.3. Operation				
Activity	**Required Action / remediation to control environmental impact**	**Person**	**In place (Yes / No)**	**Comments**
Maintenance of the Water Supply Infrastructure	• The bulk water infrastructure will require maintenance during operation. This work must be undertaken by municipal appointed staff. This EMPr must be used to mitigate against any potential risks to the environment. The following mitigation measure must be implemented on site during all inspections and maintenance work: ○ All maintenance vehicles and machinery must make use of existing access routes; ○ Laydown yards, camps, and storage areas must be more than 32m from any water resource; ○ All machinery and equipment must be inspected regularly for faults and possible leaks, these must be serviced off-site (every six months). The inspection roster must be maintained and made available to the competent authority on request. ○ The contractors used for the maintenance must have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly;			

	○ Uncontrolled access of vehicles through any watercourse must not be permitted; ○ Adequate sanitary facilities and ablutions must be provided for all personnel on site. Use of these facilities must be enforced; ○ All removed soil and material must not be stockpiled more than 32m from any water resource. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; ○ No dumping of construction material on-site may take place; ○ An on-site environmental file must be maintained. The following documents must remain on site: ○ Environmental Authorisation ○ EMPr ○ Audit reports ○ Waste register with safe disposal certificates ○ Proof of toolbox talks. ○ Any other documents requested by the ECO. ○ The waste hierarchy must be implemented on site, reduce, reuse and recycle. All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported. Safe disposal certificates must be obtained and kept on file for review. ○ Toolbox talks must be conducted on a regular basis which must cover environmental topic dealing with but not limited to, waste management, conservation of water, protection of fauna and flora and good housekeeping. ○ An ECO (Environmental Control Officer) must be appointed before commencement of construction to monitor the entire construction phase. The ECO must undertake an audit every month during maintenance activities. ○ Keep proof of appointment and contact details as well as dates of audits. ○ All audit report must be sent to the compliance division of EDTEA for review.			

Soil Erosion	• The erosion protection features installed on the site must be checked to ensure, they continue to perform their function during the operational phase of the project.	APP		
Vegetation	• Alien vegetation must be monitored and removed on an on-going basis as per the Invasive Alien Plant Programme. • Indigenous vegetation planting must continue on an on-going basis if it is required.	APP		

SECTION 5: DEFINITIONS

Stormwater
Clean rainwater, must be allowed to enter the stormwater system or natural water bodies without causing erosion. Stormwater must not be contaminated with any other substance including soaps, washings, hazardous materials, soil etc.

Greywater
This is wash water that may contain non-hazardous soaps, i.e. bathwater, vehicle wash water etc. This must not be permitted to enter the stormwater system but can be disposed of in the sewage system or as effluent. If no sewage system is available on site, the greywater must be collected and disposed of.

Sewage
Human excrement from chemical toilets.

Raw materials for which source statement must be obtained
Topsoil, sands, natural gravels, crushed stone, asphalt, clay liners, timber etc. E.G., sand may only be obtained from approved sand winning operations, which is licensed and has an approved EMPr for operation.

Incidents
All incidents must be recorded. Minor incidents could include small spills of less than 5l that do not enter a water body or any stormwater drains, as well as housekeeping issues and general small non-compliances with the requirements of the EMPr. Major incidents are those that must be reported to the authorities and include all incidents involving contamination of a water body or stormwater or other reportable incidents as defined below.

Reportable incident is defined as ‘an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed’ NEMA Section 30, ‘includes any incident or accident in which a substance (a) pollutes or has the potential to pollute a water resource; or (b) has, or is likely to have, a detrimental effect on a water resource.’ NWA Section 20.

SECTION 6: RECORDS

Training Register – Record any training that has taken place.		
Training Conducted:		
Training provided by:		
Date of Training	**Name**	**Signature**

Non-conformance Record – Record any non-conformances i.e. small spills, overflowing waste bins etc.				
Date of Non-conformance	**Details of non-conformance**	**Mitigation required**	**Corrective action taken**	**Date action completed**

Complaints register – Record any complaints received from neighbours or the public regarding dust or pollutions, noise or nuisance.					
Date of complaint	**Complainant's Name**	**Complainants Contact Number**	**Details of complaint**	**Corrective action taken**	**Date action completed**

Environmental Emergency Response and Definition of an Incident	
Aim of this document	• To effectively manage the response to emergency incidents and control these incidents should they occur. • To ensure that such incidents are recorded and, where possible, all measures are taken to prevent them from re-occurring. • To provide a definition for what would be considered a reportable incident in terms of the environmental legislation. Activities covered in this procedure include: • Identification and definition of an incident and whether or not it needs to be reported to the authorities. • Reporting to the relevant authorities if a reportable incident occurs • Procedure to follow in the event of a spill or fire.
Personnel Duties and Responsibilities	The contractor is responsible for: • Ensuring all activities are carried out as per this procedure and that the company complies with relevant legislation. • Maintaining a register of all incidents as well as ensuring that an incident report is generated for each incident, including details of the incident and how it was closed out. • Ensuring that safe disposal certificates are obtained for any waste materials generated as a result of an incident and that this waste is recorded. • Providing the necessary spill kit equipment and drums for storage of contaminated soil etc.
Training Requirements	• All personnel and workforce to undergo a site safety and environmental induction before starting work on site. All employees to be trained on how to respond to an environmental incident and whom to contact in order to ensure that the incident is addressed and recorded and if necessary reported.
Definition of a "reportable incident"	• In terms of the National Environmental Management Act, major incidents must be reported to the authorities. In terms of the National Water Act, any incident involving a substance which has the potential to pollute a water resource must be reported, i.e. any spill of into a watercourse or the stormwater system must be reported. The relevant sections from the legislation are provided below:
National Environmental Management Act	*As defined by NEMA, section 30 "Control of emergency incidents".* *(1) In this section—* *(a) "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed;* *(b) "responsible person" includes any person who—* *(i) is responsible for the incident;* *(ii) owns any hazardous substance involved in the incident; or* *(iii) was in control of any hazardous substance involved in the incident at the time of the incident;*

	(c) "relevant authority" means— *(i) a municipality with jurisdiction over the area in which an incident occurs;* *(ii) a provincial head of department or any other provincial official designated for that purpose by the MEC in a province in which an incident occurs;* *(iii) the Director-General;* *(iv) any other Director-General of a national department.*
National Water Act	*As defined by the National Water Act section 20 "Control of emergency incidents"* *(1) In this section ``incident'' includes any incident or accident in which a substance -* *(a) pollutes or has the potential to pollute a water resource; or* *(b) has, or is likely to have, a detrimental effect on a water resource.*
Reporting to the authorities	If a reportable incident occurs, the Site Agent / Project Manager and Environmental Control Officer must be notified immediately. No site staff may communicate directly with the authorities. The relevant sections from the legislation are included below: As taken from NEMA, section 30: Control of Emergency Incidents: *(3) The responsible person or, where the incident occurred in the course of that person´s employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available—* *(a) the nature of the incident;* *(b) any risks posed by the incident to public health, safety and property;* *(c) the toxicity of substances or byproducts released by the incident; and* *(d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment too—* *(i) the Director-General;* *(ii) the South African Police Services and the relevant fire prevention service;* *(iii) the relevant provincial head of department or municipality; and* *(iv) all persons whose health may be affected by the incident.* *(4) The responsible person or, where the incident occurred in the course of that person´s employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident—* *(a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;* *(b) undertake cleanup procedures;* *(c) remedy the effects of the incident;* *(d) assess the immediate and long term effects of the incident on the environment and public health.* *(5) The responsible person or, where the incident occurred in the course of that person´s employment, his or her employer, must, within 14 days of the incident, report to the Director-General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including—* *(a) the nature of the incident;*

	(b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects; *(c) initial measures taken to minimise impacts;* *(d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and* *(e) measures taken and to be taken to avoid a recurrence of such incident.* *(6) A relevant authority may direct the responsible person to undertake specific measures within a specific time to fulfil his or her obligations under subsections (4) and (5): Provided that the relevant authority must, when considering any such measure or time period, have regard to the following:* *(a) the principles set out in section 2;* *(b) the severity of any impact on the environment as a result of the incident and the costs of the measures being considered;* *(c) any measures already taken or proposed by the person on whom measures are to be imposed, if applicable;* *(d) the desirability of the State fulfilling its role as custodian holding the environment in public trust for the people;* *(e) any other relevant factors.* *(7) A verbal directive must be confirmed in writing at the earliest opportunity, which must be within seven days.* *(8) Should—* *(a) the responsible person fails to comply, or inadequately comply with a directive under subsection (6);* *(b) there be uncertainty as to who the responsible person is; or* *(c) there be an immediate risk of serious danger to the public or potentially serious detriment to the environment, a relevant authority may take the measures it considers necessary to—* *(i) contain and minimise the effects of the incident;* *(ii) undertake cleanup procedures; and* *(iii) remedy the effects of the incident.*
National Water Act section 20: Control of emergency incidents	*(2) In this section, ``responsible person'' includes any person who -* *(a) is responsible for the incident;* *(b) owns the substance involved in the incident, or* *(c) was in control of the substance involved in the incident at the time of the incident.* *(3) The responsible person, any other person involved in the incident or any other person with knowledge of the incident must, as soon as reasonably practicable after obtaining knowledge of the incident, report to -* *(a) the Department;* *(b) the South African Police Service or the relevant fire department; or* *(c) the relevant catchment management agency.* *(4) A responsible person must -* *(a) take all reasonable measures to contain and minimise the effects of the incident;* *(b) undertake to clean-up procedures;* *(c) remedy the effects of the incident; and*

	(d) take such measures as the catchment management agency may either verbally or in writing direct within the time specified by such institution.
Spill response	
Responsible Person/s	The spill is reported to the site foreman who must notify his superior. All employees must be made aware of the procedure in case of a spill.
Procedure	1. Identify the nature of the spill, e.g. paint, oil or lubricants 2. Locate spill kit 3. Contain spill according to the training provided 4. Where necessary, contact external spill control contractors 5. Ensure spill does not cause any external contamination (such as storm/groundwater or soil) 6. Ensure that cleanup measures are taken if any contamination has occurred 7. Record in emergency response record the: • Nature of incident • Cause of incident • Clean up measures • Mitigation measures are taken 8. Record in non-conformance register 9. The ECO and Project Manager will determine if the event qualifies as an incident and take steps to report the incident to the necessary authorities, i.e. EDTEA and DWS. 10. The ECO shall review all spill reports
Fire	
Responsible Person/s	The fire is reported to the site foreman All employees must be made aware of the procedure in case of fire.
Procedure	1. Identify the source and nature of fire. 2. In case of small fire extinguish with material appropriate to the nature of the fire 3. In case of a large fire contact Fire Department 4. In the site camp, seal off exposed stormwater drains to ensure firewater does not cause any external contamination. If on-site, take measures to prevent firewater from entering any water body. 5. Ensure that clean-up measures are taken if any contamination has occurred 6. Record in emergency response record the: • Nature of incident • Cause of incident • Clean up measures • Mitigation measures are taken 7. Record in non-compliance register 8. The ECO and Project Manager will determine if the event qualifies as an incident and take steps to report to the authorities.

	9. The EO shall review incident/nonconformance reports 10. Adjustments will be made, if necessary, to the operational and emergency procedures and the Environmental Management System to prevent future occurrences
Explosion	
Responsible Person/S	The explosion is reported to the site foreman who must notify his superior. All employees must be made aware of the procedure in case of an explosion.
Procedure	1. Identify the source and nature of the explosion. 2. In case of small fire as a result of the explosion, extinguish with material appropriate to the nature of the fire 3. In case of a large fire as a result of the explosion contact Fire Department 4. In the site camp, seal off exposed stormwater drains to ensure firewater does not cause any external contamination. If on-site, take measures to prevent firewater from entering any water body. 5. Ensure that clean-up measures are taken if any contamination has occurred 6. Record in emergency response record the: • Nature of incident • Cause of incident • Clean up measures • Mitigation measures are taken 7. Record in non-compliance register 8. The ECO and Project Manager will determine if the event qualifies as an incident and take steps to report the incident to the necessary authorities, i.e. EDTEA and DWS. 9. The ECO shall review spill reports
Resource Requirements	
Materials	• Separate drums for contaminated soil. • Spade and clean soil • Fire equipment

Alien Plant Control Plan

Alien Plant Control Plan	
Activity	**Site Mitigation Measures to control alien plants**
Training and expertise of personnel involved in Alien plant management on site	• It is rare that a contractor has employees or members with good knowledge of alien plants and their eradication, who can then eradicate these plants effectively and on a near-complete basis. Partial knowledge means that some alien species are missed or ignored or indigenous plants harmed. Partial work or work that is not sustained is also ineffective in the long run as any residual presence can regenerate and expand quickly, particularly if live material or many seeds still in the ground. • As a result, the contractor must continually train their works as to the importance of alien plant control and at the same time providing them with the correct knowledge as to which plant must be removed and what method must take place.
Alien Invasive Plant Management in the construction area	• The construction area must be kept free of alien invasive plants. Regular inspections of the site must take place. The following methods of alien plant control can be adapted: o Mechanical Control ▪ Hand pulling ▪ Manual removal using hand tools ▪ Manual removal using mechanised tools o Chemical Control ▪ Foliar spraying ▪ Handheld spraying ▪ High-pressure spraying • The construction area must be rehabilitated immediately following the completion of construction to ensure that alien invasive plants do not become established. • The construction area must be regularly inspected following rehabilitation and alien invasive plants removed if they have become established.
Responsible Use of herbicides	• Problem plants in construction areas usually short-lived weeds for which mechanical methods alone are not successful. Some use of herbicides may be unavoidable. The following must be followed during the use of herbicides: o Do not spray herbicides in windy conditions o Preferably spray in dry conditions and not before any predicted heavy rainfall as most pesticide movement either to the surface or to the groundwater will occur in the first major storm event after application. Heavy losses are reported when application occurs immediately before a major storm. o A buffer zone which must remain untreated must be retained around any watercourse. A minimum buffer of 10m must be retained. This will have to be managed by mechanical means. o Empty containers or unused herbicides must be disposed of correctly and may not be dumped on site.

Template for The Emergency Incident Report

NB! Please ensure that all the information provided in brackets are removed before submitting this report to all the Authorities.

environmental affairs Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA ENVIRONMENTAL MANAGEMENT INSPECTORATE	**Document Type:**	**Emergency Incident Report**	
	Title for the incident:		
	Date of the incident:		
Reference:		**Initial Submission Date:**	
Revision No.:		**Compiled by:**	

This form provides a template for the emergency incident report required in terms of section 30(5) of the National Environmental Management Act (Act No. 107 of 1998) (hereinafter "NEMA") in which the responsible person or, where the incident occurred in the course of that person´s employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including: (a) the nature of the incident; (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects; (c) initial measures taken to minimise impacts; (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and (e) measures taken and to be taken to avoid a recurrence of such incident.

In terms of section 30(1)(a) of NEMA, an "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.

In line with section 24 of the Constitution of the Republic of South Africa (Act No. 108 of 1996), "serious" is taken to be a measure of the impact of an incident where such an incident has had, could have had, is having, or will have a negative impact on human health or well-being.

1. RESPONSIBLE PERSON

In terms of section 30(1)(b) of NEMA, the "responsible person" includes any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident

1.1. Name:		**1.2. Designation:**	
1.3. Postal Address:		**1.4. Physical Address:**	
1.5. Telephone (B/H):		**1.6. Telephone (A/H):**	
1.7. Fax:			
1.8. E-mail:			
1.9. Nature of Business:			

2. EMERGENCY INCIDENT SUMMARY INFORMATION

Mark the appropriate boxes

2.1. Fire:		**2.2. Spill:**		**2.3. Explosion:**		**2.4. Gaseous Emission:**	
2.5. Injuries		**2.6. Reportable injuries:**		**2.7. Hospitalisation:**		**2.8. Fatalities:**	
2.9. Open water impacts:		**2.10. Ground water impacts:**		**2.11. Atmospheric impacts:**		**2.12. Soil impacts:**	
2.13. Own emergency response involved		**2.14. Fire prevention services involved**		**2.15. Government hazardous materials emergency response involved**		**2.16. More than 1 governmental emergency response service involved**	
2.17. Emission of non-toxic substances at low concentrations		**2.18. Emission of non-toxic substances at high concentrations**		**2.19. Emission of toxic substances at low concentrations**		**2.20. Emission of toxic substances at high concentrations**	
2.21. No evacuation required		**2.22. Immediate area evacuated**		**2.23. Immediate surrounds evacuated**		**2.24. Evacuation of the general public**	
2.25. Others							

3. INITIAL EMERGENCY INCIDENT REPORT

In terms of section 30(3) of NEMA, the responsible person or, where the incident occurred in the course of that person´s employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available: (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or byproducts released by the incident; and (d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to: (i) the Director General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.

3.1. Description	**3.2. Date:**	**3.3. Time:**	**3.4. Medium:**	**3.5. 3.5. Name and contact details:**
Relevant fire prevention service: (in case of fire)	[submission date]	[submission time]	[Fax, phone, SMS, letter, etc.)	[Who was the report made to?]
LOCAL:				
PROVINCIAL: **(Those deal with Environmental issues)**				
DIRECTOR GENERAL: (Department of Environmental Affairs)				
Any other Director General of National Department, E.g. Department of Water Affairs				

4. INCIDENT DETAILS

In terms of NEMA section 30(5)(a) and (d), the responsible person must report on the nature of the incident as well as the causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure

4.1. Location of the incident	[Provide physical address of the location where the incident happened including the GPS co-ordinates]		
4.2. Incident start date and time:		**4.3. Incident duration:**	
4.4. Duration of exposure:			
4.5. Incident description:			

Background of the incident:

Operation:

Incident type:

Root Cause of the incident:

Contributory Factors to the incident:

Conclusion:

4.6. Wind speed and direction		**4.7. Ambient air temperature**	
4.8. Weather conditions		**4.9. Other relevant meteorological conditions**	

5. POLLUTANTS RELEASED DURING INCIDENT

In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity.

List all the pollutants directly released during the incident (i.e. exclude those pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.)

5.1. Substance or mixture of substances	5.2. Reference Number	5.3. Phase eg solid, liquid or gas	5.4. Total Quantity emitted/released	5.5. Units eg Kg, L etc	5.6. Nature of emission/release
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[Emitted from truck, underground pipe, stack, etc.]

6. SECONDARY POLLUTANTS RESULTING FROM INCIDENT

In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.

List all the pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.

6.1. Substance or mixture of substances	6.2. Reference Number	6.3. Phase	6.4. Total Quantity emitted/released	6.5. Unit	6.6. Nature of emission
[The name recognised by any national or internationally recognised chemical referencing system]	Reference to any national or internationally recognised chemical referencing system]	[solid, semi-solid, liquid or gas]	[the total measured or estimated quantity released into the environment]	[the unit of measure in respect to the quantity]	[Emitted from truck, underground pipe, stack, etc.]

7. POLLUTANT CONCENTRATIONS

In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.

List all the pollutants detailed in previous section:

7.1. Substance or mixture of substances	7.2. Reference Number	7.3. Estimated pollutant concentration on different radius			
		7.3.1. 10m	7.3.2. 100m	7.3.3. 500m	7.3.4. >2000m
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[estimate the concentration of the pollutant in water, soil and/or air within a 10m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm]	[estimate the concentration of the pollutant in water, soil and/or air within a 100m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm)]	[estimate the concentration of the pollutant in water, soil and/or air within a 500m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm)]	[estimate the concentration of the pollutant in water, soil and/or air within a > 2000 m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm)]

[1] Concentration at the plume

[2] Concentration that was falling on the ground

8. INCIDENT IMPACT

In terms of NEMA section 30(5)(b), the responsible person must report on possible acute effects on persons and the environment and the responsible must provide data needed to assess these effects;

8.1. Minor injuries	[Describe the number and types of any minor injuries that resulted from the incident or efforts to manage the incident or the impacts thereof]
8.2. Reportable injuries	[Describe the number and types of any injuries requiring statutory reporting that resulted from the incident or efforts to manage the incident or the impacts thereof]
8.3. Hospitalisation	[Describe the number and types of any injuries that required professional medical care that resulted from the incident or efforts to manage the incident or the impacts thereof]
8.4. Fatalities	[Describe the number and cause of any fatalities that resulted from the incident or efforts to manage the incident or the impacts thereof]
8.5. Biological impacts	[Describe any impacts on biological life, other than human life, e.g. fish kills, plant mortality, etc.]
8.6. Impact area	[Describe the area possibly affected by the incident or the impacts thereof including: (i) size of the area; (ii) socio-economic context; (iii) population density; (iv) sensitive environments (if any), etc.]
8.7. Data	Attach relevant impact reports, medical reports, death certificates, post mortem reports, environmental monitoring data, etc. as Annexes C1, C2,… to this report

9. EXISTING PREVENTION PROCEDURES AND/OR SYSTEMS

9.1. Foresight	[Briefly describe whether the incident could have, or had, been foreseen, e.g. was it included in any environmental impact assessment, risk assessment, health and safety plan, etc.]
9.2. Procedures and/or systems	Attach any relevant safety, health and environmental plans (including any statutory planning requirements) that detail what actions should be taken in the event of the incident that is the subject of this report
9.3. Procedure and/or systems failures	[Describe any failures or shortfalls in procedures and/or systems that may have contributed to the incident] ***All procedures and checklist in place and signed off.***
9.4. Technical measures	[Describe any technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident] Communications & discussions in place.
9.5. Technical failure	[Describe any failures of technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident]

10. INITIAL INCIDENT MANAGEMENT

In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.

10.1. Evacuation	[Describe any evacuation activities including information on the number of people evacuated and whether these people were staff or otherwise]
10.2. Technical measures	[Describe all technical measures taken to address the incident]
10.3. Mitigation measures	[Describe all measures taken to minimize the impact] ***SOPEP gear activated***
10.4. Emergency Services	[Describe any governmental emergency services involvement] ***SAMSA/TNPA advised***

11. CLEANUP AND/OR DECONTAMINATION

In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.

11.1. Cleanup and/or decontamination	*[Report on initial cleanup and or decontamination (remediation) measures taken to minimise the impact of the incident on human health and the environment. Provide copy of safe disposal certificate (if any)]*

11.2. Permissions and Instructions

Provide details of any permission and/or instructions received from any organ of state during initial incident management, cleanup and/or decontamination

11.3. Type	11.4. Statuate	11.5. Issued By	11.6. Name and contact details
[Describe the nature or type of permission or instruction]	[Provide a reference to the legal mandate for the permission or instruction]	[Provide contact details for the permitting or instructing authority]	[provide a summary of the activities carried out in terms of the permission or instruction]

12. MITIGATION MEASURES

In terms of NEMA section 30(5)(e), the responsible person must report on measures taken and to be taken to avoid a recurrence of such an incident.

12.1. Measure	12.2. Objective	12.3. Cost	12.4. Timing
[Briefly describe each of the measures taken, and to be taken, to avoid a recurrence of such incident]	[Briefly describe the objective of the measure, i.e. the desired outcome of the measure]	[Estimate the cost of the measure in terms of capital costs and/or recurrent costs]	[Provide information on the timing for the full implementation of the measure]

13. AUTHORISATIONS

Provide details on all authorisations (including permits, licenses, certificates, etc.) in respect of the activity to which this incident relates.

13.1. Type	13.2. Statute	13.3. Issued By	13.4. Issue & Expiry Date
[Describe the nature or type of authorisation, e.g. Registration Certificate]	[Provide the reference for the authorisation, e.g. section X of the National Environmental Management Act (Act No. 107 of 1989)]	[Provide contact details for the issuing authority]	[provide the date of issue and expiry]

14. HISTORY

Provide details of all similar incidents involving the responsible person in the past (i.e. from 1998). Similar incidents include those that: (i) involved similar circumstances; (ii) involved similar emissions; (iii) involved similar personnel; and/or (iv) involved similar impacts.

14.1. Incident title	14.2. Report reference	14.3. Date of incident	14.4. Summary of event
[Provide the title used in the relevant emergency incident report]	[Provide the reference in respect of the relevant emergency incident report]	[Date of incident]	[Provide a summary of the event]

Signed by, or as a mandated signatory for, the responsible person:		Date:	

APPENDIX 1
List of affected people as results of the incident

NAME	ADDRESS	PHONE	FAULT	REMARKS

APPENDIX 2
Layout map of the area likely to be affected or affected as a result of the incident

Disclaimer

Any other information not covered in the reporting template must be included.

CAUTION

In terms of section 30 (11) of NEMA as amended, it is an offence not to report an incident and liable on convection to a fine not exceeding R 1 million or imprisonment for a period not exceeding 1 year, or to both such a fine and such imprisonment.