ENVIRONMENTAL MANAGEMENT PROGRAMME

SEATON RESIDENTIAL ESTATE

KWADUKUZA LOCAL MUNICIPALITY

DC29/EIA/4951/2005/AMEND/2018/2020/2021

DWS LICENCE NO.: 11/U30E/ACI/10565

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Strategic Development & Environmental Partner

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This Environmental Management Programme (EMPr) was compiled by Stephanie Denison from Confluence Strategic Development (Pty) Ltd (details of the Environmental Assessment Practitioner provided below). The contents of this Environmental Management Programme have been compiled in accordance with section 24N of the National Environmental Management Act 107 of 1998 as amended and Appendix 4 for of the Environmental Impact Assessment Regulations, 2014 as amended.

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24/01/2023

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1.0. PROJECT DESCRIPTION

1.1. BACKGROUND

Seaton Estate was authorised by the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) on the 02nd February 2005 (EIA Ref: EIA/4951; Figure 1). Environmental Authorisation was granted for this development in terms of section 22 of the Environmental Conservation Act, Act No. 73 of 1989. The development authorised consisted of a change in land use from agriculture to other use for the purpose of establishing a residential development and associated infrastructure. There have been four amendments to the Environmental Authorisation (EA) to date:

1. Amendment 1 (EIA/4951/2005/AMEND/2018) Environmental Authorisation was transferred from Two Ships Trading 39 (Pty) Ltd into the new property owners name, Sherpa Trade and Invest 31 (Pty) Ltd on the 14th November 2018.
2. Amendment 2 (EIA/4558/2005/Amend/2019) A Part 1 amendment was granted on the 24th May 2019 for minor amendments to the western portion of the layout plan (i.e. equestrian estate) including the rerouting of a roadway to avoid traversing a wetland and the overall increase of erven from 27 (properties with an area of greater than 10 000m^2) to 79 smaller erven.
3. Amendment 3 (EIA/4951/2005/Amend/2018/2020) A Part 2 amendment application was granted on the 18th November 2020 to amend the layout of the eastern portion of Seaton Estate. The amended layout was for an increase in the density of residential units from 327 low density, 192 medium density and 506 cluster housing units to 692 medium density and 817 cluster housing units.
4. Amendment 4 (DC29/EIA/4951/2005/Amend/2018/2020/2021) was granted on the 29th March 2022 to amend the layout of the western portion of Seaton Estate. The amended layout is for an increase in the density of residential erven from 79 large erven to 424 smaller erven and 6.5 hectares of PUD sites (max density of 30 units / ha).
5. Amendment 5 (DC29/EIA/4951/2005/Amend/2018/2020/2021/2022) was granted on the 07th July 2022 to amend the layout of the eastern portion of Seaton Estate resulting in a decrease in the density of residential erven east of the N2.

The mitigation measures provided in this Environmental Management Programme (EMPr) include mitigation measures that have previously been provided for other areas of Seaton Estate (i.e. the previous EMPr prepared by EnviroPro and dated July 2020).

A Water Use Licence has been granted for the western portion of the Estate, known as the Lalela Development. A Water Use Authorisation is required in terms of section 21 (c) & (i), (a) and (g) for the following activities on site (shown in Figure 2):

Facility	Latitude	Longitude
Centre of site	29°27'40.33"S	31°13'50.99"E
Rehabilitation of Wetland HGM 2	29°27'35.29"S	31°14'26.84"E
Road Crossing 1	29°27'44.30"S	31°14'10.34"E
Road Crossing 2	29°27'35.13"S	31°14'26.76"E
Sewer Pipeline Crossing 1	29°27'44.30"S	31°14'10.34"E
Sewer Pipeline Crossing 2	29°27'54.14"S	31°14'11.88"E
Sewer Pipeline Crossing 3	29°27'54.99"S	31°14'2.84"E

Sewer Pipeline Crossing 4	29°28'1.34"S	31°14'16.04"E
Sewer Pipeline Crossing 5	29°27'39.22"S	31°13'54.52"E
Sewer Pipeline Crossing 6	29°27'48.36"S	31°14'01.29"E
Sewer Pump Station 1	29°27'50.34"S	31°14'0.95"E
Sewer Pump Station 2	29°27'43.40"S	31°13'54.62"E
Sewer Pump Station 3	29°28'5.30"S	31°14'4.22"E
Sewer Pump Station 4	29°27'30.90"S	31°14'20.67"E
Water Pipeline Crossing 1	29°27'44.30"S	31°14'10.34"E
Water Pipeline Crossing 2	29°28'1.22"S	31°14'19.56"E
Borehole 1	29°27'42.07"S	31°14'18.04"E
Borehole 2	29°27'46.50"S	31°14'28.20"E

1.2. DESCRIPTION OF ACTIVITY

Activities covered in the EMPr, as described in the Environmental Authorisation, are as follows[1].

"1.1. The change of land use from agriculture to other use, for purpose of establishing a residential development and associated infrastructure on the property known as Seaton Estate, near Sheffield Beach and within the magisterial district of KwaDukuza. The proposed development comprises:
a) Residential estate with 692 medium-density and 817 cluster housing units ***east of the N2****.*
b) ***Residential estate with 424 smaller erven and 6.5 hectares of PUD sites with a maximum density of 30 units / hectare (maximum of 195 units) west of the N2.***
c) Equestrian centre ***for keeping horses*** *with two polo fields, pavilion, resent, shops, 50 bed hotel and conference facilities.*
d) Community and commercial facilities to serve the development.
e) Associated infrastructure and services including but not limited to roads, electricity, water and sanitation.
f) Rehabilitation of wetlands contained within the development property.

1.2. The construction of an interchange on the N2 National Highway, including northbound and southbound entrances and exit points".

From a Water Use License perspective, the water use activities associated with the Lalela development are shown in Figure 2 and described as follows:

"Club Seaton / Lalela Development consists of the following: 496 individual residential erven and 8 hectares of PUD sites, internal roads with two wetland crossings; gatehouse; internal sewerage reticulation, which includes four sewer pump stations (including sumps), with six sewer pipeline wetland crossings; internal water reticulation with two water pipeline crossings; registration of two existing boreholes for use at the equestrian centre (horse drinking, cleaning stables etc.); and rehabilitation of HGM 2 where the existing road will be removed.

Activities to be undertaken on the site as part of the development will include: abstraction of water from boreholes BH1 and BH2; the construction of Club Seaton and Associated Infrastructure within 500m of the HGM1, HGM2, HGM3 and HGM4, removal of existing road and rehabilitation of HGM 2; the formalisation of RC1 during construction within

HGM3; the construction of RC2 and temporary impedance structure during construction within HGM2; the construction of SC1 across HGM3 (underground) ; the construction of SC2 – Piers 1-9 and temporary impedance structures during the construction within HGM3, the construction of SC3 – Piers 1 – 7 and temporary impedance structures during the construction within HGM4, the construction of SC4 – Piers 1-7 and temporary impedance structures during the construction within HGM3; the construction of SC5 across HGM1 (underground); the construction of across HGM3 (underground), the construction of WC1 and WC2 across HGM3 (underground) and the construction and operation of four sewer pump stations (including sumps)".

Figure 1: Master Layout Showing the Full Extent of the Seaton Estate (Source: Nsika, 2020).

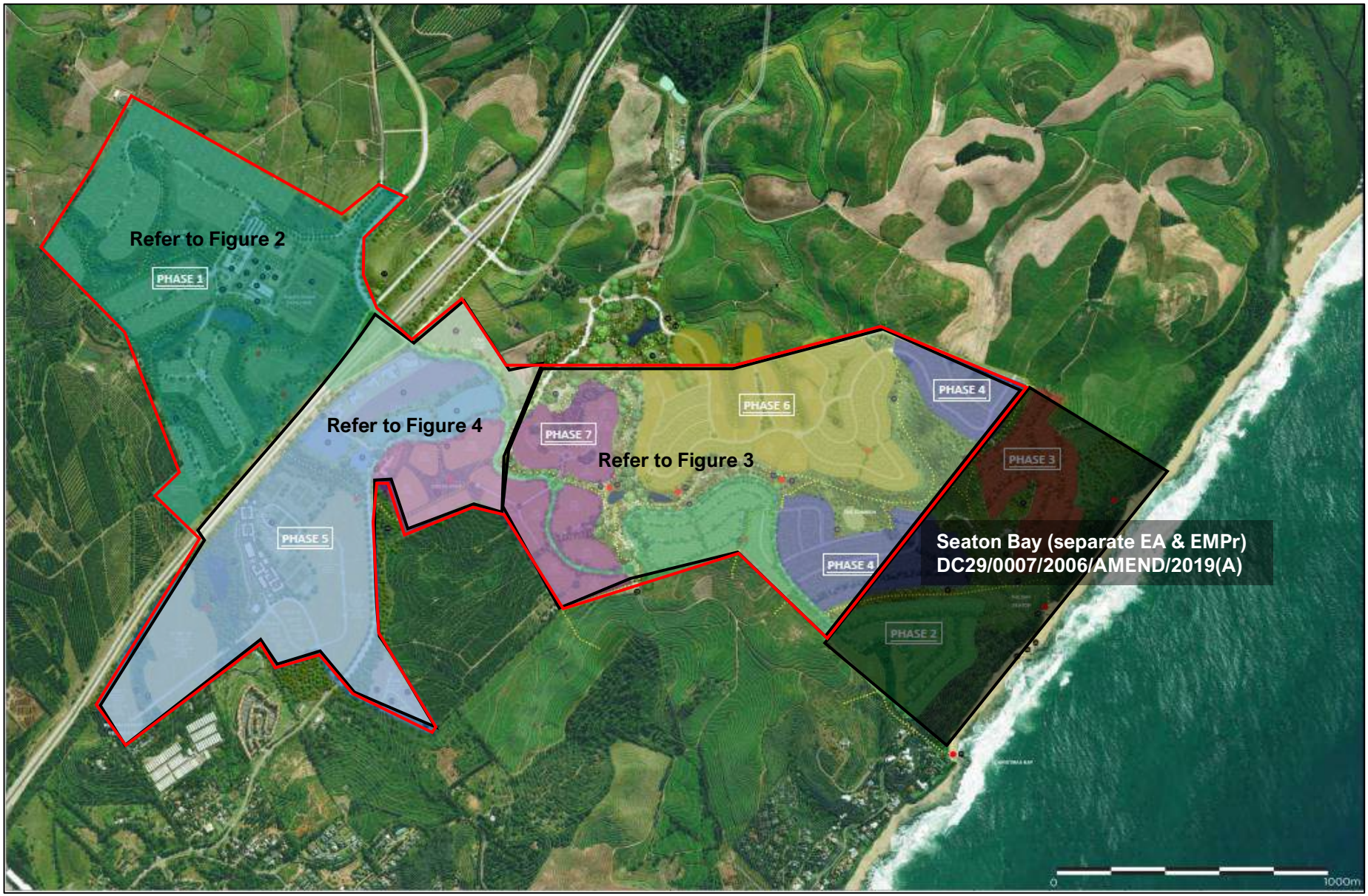


Figure 2: Lalela Master Layout Showing Watercourses within 500m Radius of the Site and Water Uses (Source: QGIS vs 3.2, 2022).

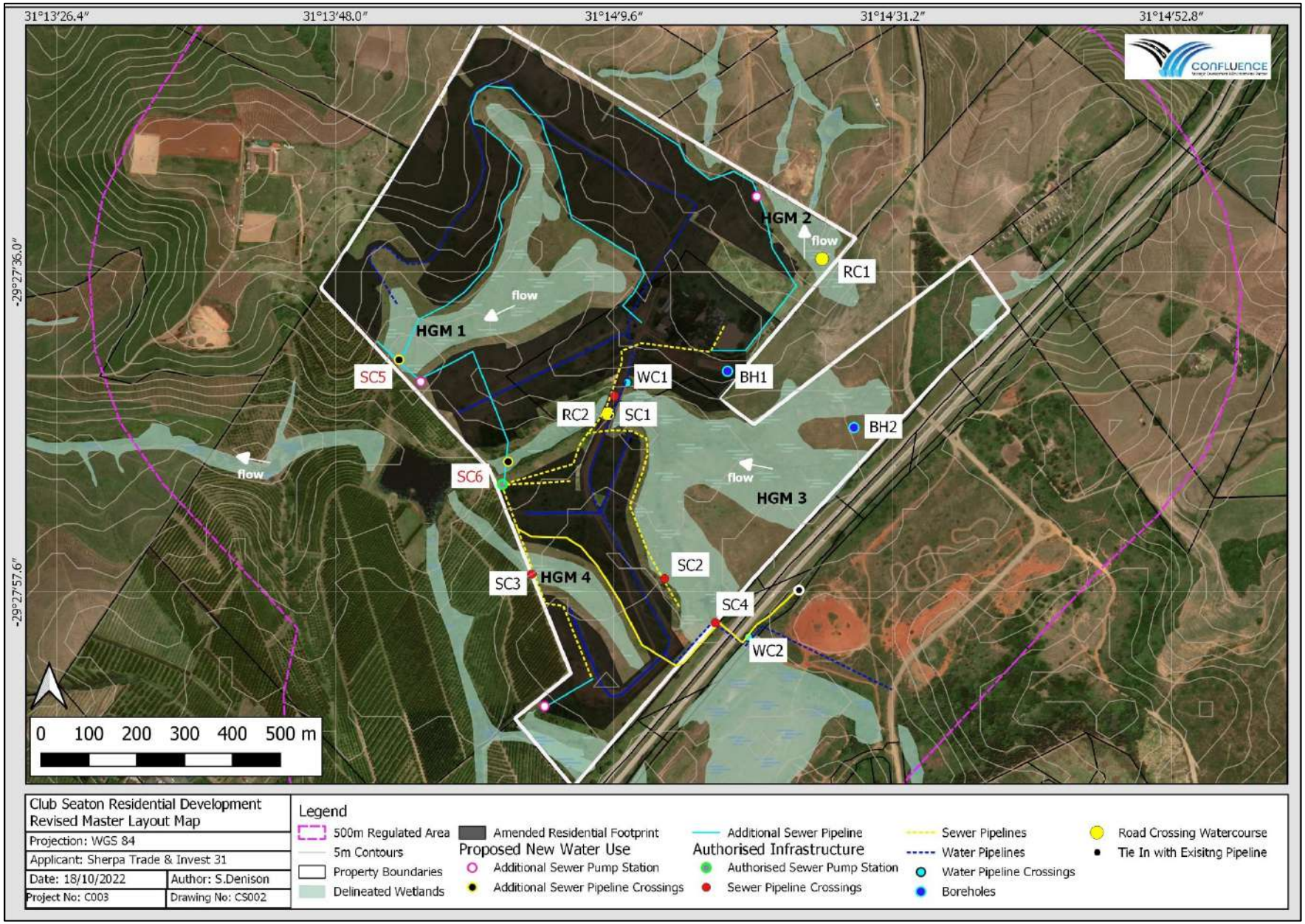
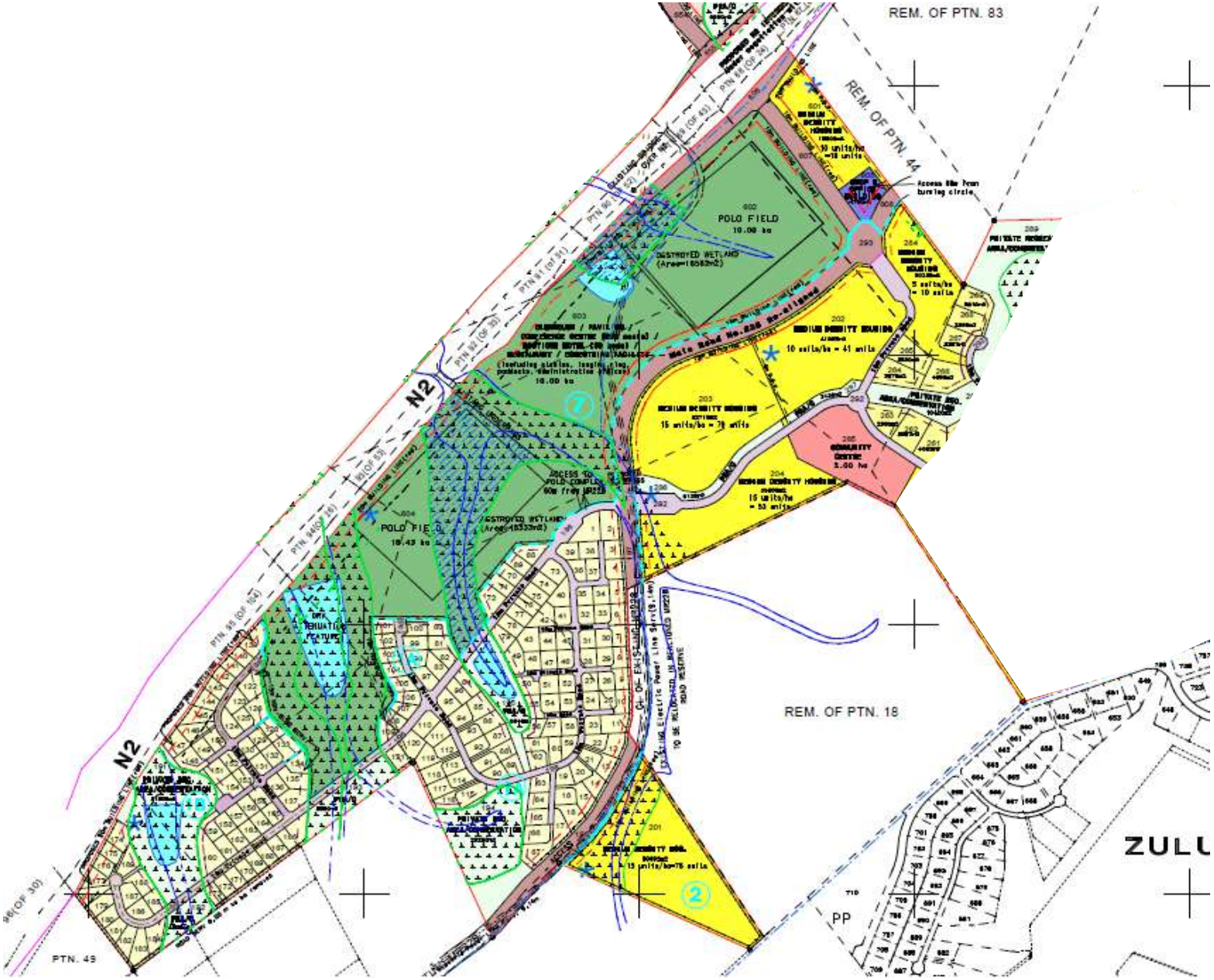


Figure 3: Layout for the Eastern Section of the Seaton Estate (source: Nsika Architecture & Design, 02nd April 2020).

Figure 4: Layout for The Central Portion of the Seaton Estate (Source: Ndebele Kirby Planners, 2004).



1.3. ENVIRONMENTAL SENSITIVITIES

Prior to development taking place, the study area consisted of old cane land with very little natural habitat. The following sensitive environmental features have been identified within the study and are indicated in Figure 5:

- Several wetland systems originate in Seaton Estate and flow in all directions beyond the Estate boundaries. There is a 15m buffer associated with the wetlands.
- The Open Space System is shaded in green in Figure 5.
- The wetlands and Open Space System must be re-vegetated to restore ecological integrity on the site and provides corridors with neighbouring developments. The Landscape Philosophy and Concept Master Plan has been attached under Appendix 1.

Contractors, Homeowners and Occupiers on site must be made aware of the environmental sensitivities and associated buffers. The wetland buffer must be clearly demarcated by the Environmental Control Officer (ECO) prior to construction commencing in that section of the Estate. An Environmental Awareness Plan has been prepared for Contractors working on site (section 5.0 of the EMPr). The Environmental Awareness Plan will form part of the Environmental Induction training prior to work commencing.

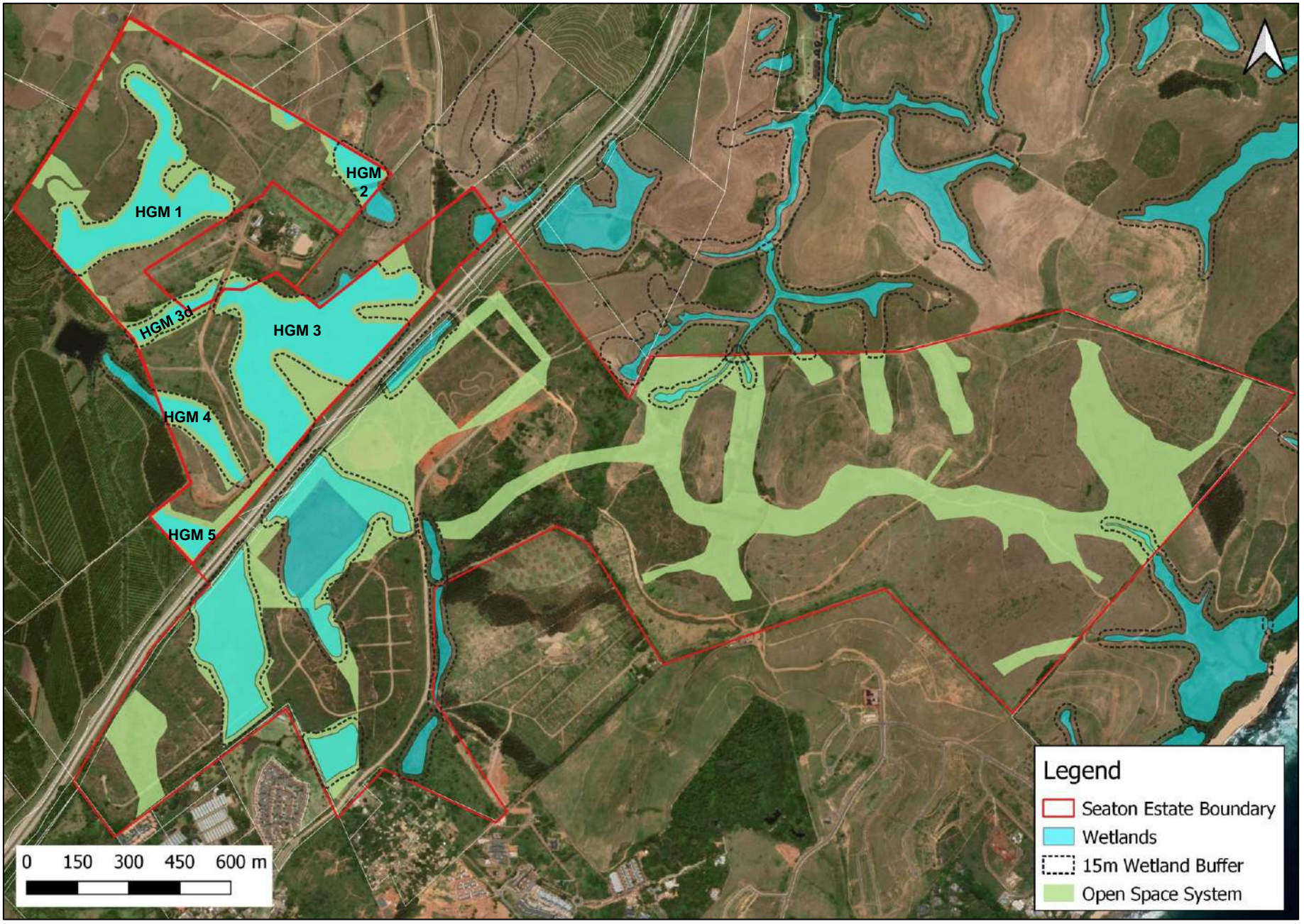
1.4. IMPACT MANAGEMENT OUTCOMES

Considering the type of activity and the environmental sensitivities associated with the site, impact management actions were formulated during the Environmental Impact Assessment to avoid, manage and mitigate risks that were identified for the different phases of the activity including planning and design, pre-construction activities, construction activities, rehabilitation / post-construction and operational activities (where applicable). Impact management actions are in place to achieve the following impact management outcomes:

Table 1: Impact Management Outcomes

Primary Impact Management Outcome: *To create a sustainable development by avoiding ecologically sensitive areas and retaining open space linkages.*		
#	**Impact Management Outcome**	**Phase**
1	Avoidance of environmentally sensitive areas on site (see Figure 5).	Planning & Design and Pre-Construction
2	No long-term, indirect impact on the functioning of the down-gradient wetland system.	Planning & Design
3	Improve stormwater management to reduce flow quantity and velocity discharging into valley lines.	Planning & Design
4	Minimise environmental risk through basic environmental training.	Pre-Construction
5	Impact on environmentally sensitive areas minimised during site establishment and construction phase.	Construction
6	Ensure construction footprint does not extend into No-Go areas within Seaton Estate and adjacent developments (i.e. nuisance).	Construction
7	Restore ecological integrity in the Seaton Estate.	Rehabilitation / Post Construction
8	To ensure there are no long-lasting impacts on the environment remaining once construction is complete.	Rehabilitation / Post Construction
9	Maintain functional Open Space Systems within Seaton Estate.	Operation

Figure 5: Aerial Map Showing Seaton Estate and Associated Environmentally Sensitive / No-Go Areas.



2.0. LEGISLATION

Table 2 provides a list of legislation and municipal planning frameworks which are applicable to the activity. The holder of the Environmental Authorisation, Contractors working on site and Homeowners must be aware of the legal requirements and address non-compliances when they arise.

Table 2: Legislation Applicable to The Construction & Operation of Seaton Estate.

Legislation	Acronym	Comment
Environment Conservation Act (Act No. 73 of 1989).	ECA	Environmental Authorisation for this development was granted in terms of the ECA. The ECA was repealed by NEMA. The principles of NEMA are therefore applicable to the development.
National Environmental Management Act (Act No. 107 of 1998 as amended).	NEMA	NEMA provides environmental management principles that are applicable across South Africa to fulfil section 24 of the Constitution, which is the right to "*an environment that is not harmful to their health or wellbeing*". Section 24 of NEMA defines the activities requiring Environmental Authorisation and the processes to be followed to obtain Environmental Authorisation (published in the Environmental Impact Assessment Regulations, 2014 as amended). Chapter 5 of these Regulations makes provisions for amendments to be made to existing, valid Environmental Authorisations. Section 28 of the NEMA requires every person causing significant pollution or degradation of the environment, to take reasonable measures to prevent it from occurring, continuing or recurring.
National Environmental Management: Waste Act (Act No. 59 of 2008 as amended).	NEM: WA	NEM: WA provides measures to protect health and the environment of South Africa by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. There are no activities on site that trigger a Waste Management License however measures have been provided in the Environmental Management Programme (EMPr) to ensure that waste management is compliant with the requirements of NEM: WA during the construction and operation of the Estate.
National Environmental Management Biodiversity Act (Act No. 10 of 2004).	NEM: BA	To manage and conserve South Africa's Biodiversity and protect species and ecosystems that warrant national protection. As per the findings of the Ecological Assessment, the site is highly transformed and has low ecological significance. Wetland and drainage features however, offer some ecological value. The preferred layout has been adjusted to ensure that the 15m wetland buffer is adhered to and that stormwater is well managed.
National Environmental Management: Air Quality Act (Act No. 39 of 2004).	NEM: AQA	Regulates air quality to protect the environment by providing measures to prevent pollution and ecological degradation and for securing ecologically sustainable development. There are no activities on site that trigger an Air Emissions License however measures have been provided in the EMPr to ensure that air quality is managed in line with the requirements of NEM: AQA during the construction and operation of the Estate.
National Water Act (Act No. 36 of 1998) (as amended).	NWA	Provides for fundamental reform of the law relating to water resources. There are two Water Use Authorisations in place for the Seaton Estate. The Western Portion of the Estate is covered under Licence No.: 11/U30E/ACI/10565; File No.: 27/2/1/U530/1/4/5/34. There is a General Authorisation in place for the eastern portion of the Estate (Seaton_Residential_Estate granted 02nd November 2020).
National Forests Act (Act No. 84 of 1998).	NFA	To conserve and protect natural forests and woodlands as well as ensuring development with principles of sustainable management. There is no natural forests or protected tree species within the Seaton Estate.
National Heritage Resources Act (Act No. 25 of 1999).	NHRA	For the management of national heritage resources and to nurture and conserve heritage resources so that they may be bequeathed to future generations. The study area has been largely transformed by long-term sugarcane farming. There is no infrastructure on site and no permits from the provincial heritage authority, AMAFA, are required. The EMPr includes measures to be put in place should a fossil or object with cultural significance be uncovered during the construction phase.

KwaDukuza Local Municipality Spatial Development Framework (2017-2022).	KDM SDF	The KwaDukuza SDF classifies the larger Sheffield Beach area as an area with *immediate development potential*. The development is not in conflict with the densification principles contained in the SDF.
iLembe District Municipality Integrated Development Plan (2020 – 2021 Review).	iLembe IDP	The larger Sheffield Beach as an urban settlement zone. "*Construction and Property Development*" is one of the main economic sectors of iLembe Municipality identified in the IDP. The higher density development is as per the principle listed under section 5.2.5.5 of the IDP: "*Growth and development is to be consolidated to achieve appropriate densities and thresholds to support social infrastructure*". As above, a separate town planning application is underway and will motivate the rezoning to ensure that the development is aligned with the iLembe IDP.

3.0. MONITORING REQUIREMENTS

As per the findings of the Environmental Impact Assessment, the holder of the Environmental Authorisation is responsible for appointing an independent Environmental Control Officer (ECO) to monitor the implementation of the impact management actions. Table 3 provides a summary of the monitoring requirements to ensure effective implementation of the EMPr. It is noted that the mitigation measures listed in the EMPr as well as the Conditions of the Environmental Authorisation must be adhered to.

The appointed ECO must have the following skills:

- Knowledge and understanding of the construction industry.
- Knowledge of good practise environmental management standards.
- Understanding of the legal context of the activity including the Duty of Care and Polluter Pays principles.
- At least 1 year experience in the ECO field.

Table 3: Monitoring Requirements

Method of Monitoring	Site inspection by ECO to monitor the implementation of the EMPr during construction and the post-construction audit. • Visual inspections & photographs for record keeping purposes. • Water samples taken from HGM1 and HGM 3 in the western portion of Seaton Estate (HGM units labelled in Figure 5).
Frequency of Monitoring	• Monthly site inspection by ECO during construction. • Annual water quality samples must be taken by the ECO during construction and operational phases. • Water quality samples to be taken upstream and downstream of sewer pump stations every 6 months (frequency to be monitored by ECO). • One post-construction audit by ECO on completion of each phase of the development.
Mechanism for Monitoring Compliance	• Written audit report to be submitted by the ECO after the site inspection to the Holder of Environmental Authorisation, relevant Contractor and EDTEA: Compliance, Monitoring & Enforcement. • The following water quality indicators must be monitored at HGM 1 & 3: ▪ Faecal coliforms ▪ *E.coli* ▪ N & P ▪ Ammonia

	▪ pH • Wetland specialist to provide comment on the Present Ecological State (PES) of HGM 1, HGM 2 and HGM 3 in Seaton West on an annual basis to ensure that there is no degradation of the wetland condition (HGM units labelled in Figure 5). The PES score should improve over time as the rehabilitation of the site is carried out. Baseline results as follows: ▪ **HGM 1 (Valley Head Seep)** - Transformed primarily on account of historical land use changes. - Subject to drainage to facilitate farming activities and historic infilling to accommodate fields and other equestrian facilitates. - Minor erosion and bank collapse evident. - PES category "D" or *largely modified*. - Ecological functions are primarily sediment trapping, erosion control and trapping of phosphate and nitrates. ▪ **HGM 2 (Valley Head Seep)** - Subjected to significant impacts arising from former agricultural activities, horse grazing, the establishment of a road and other infrastructure. The Springvale Country Estate boundary wall bisects this wetland, further altering the hydrology. - PES category "D" or *largely modified*. - Ecological function is primarily nutrient trapping. ▪ **HGM 3 (Hill Side Seep)** - This is the largest wetland on site and has been significantly impacted by anthropogenic factors. - Drainage is in a westerly direction, underneath the N2. The wetland drains into an agricultural dam located on the neighbouring property, Upton Farm. The water from this dam is used to irrigate Macadamia orchards on the neighbouring property. - A road bisects the wetland creating an attenuation feature, which has been taking into consideration during the design of the stormwater management plan. This attenuation feature supports a maturing sedge community. - PES category "C" or *moderately modified*. - Ecological functions are primarily flood attenuation, toxicant removal and redress of nutrient loading.
Program for Reporting on Compliance	• Prior to a Contractor commencing with construction on a certain section of the Estate, environmental induction training must be carried out in accordance with the Environmental Awareness Plan in section 5.0. • The register in section 6.0 must be signed by all Primary Contractors working on the site. • The roles and responsibilities of the individuals involved must be determined and the line of communication outlined by the ECO in the audit reports. • Any non-compliances with the EMPr identified during the site inspection must be reported to the relevant Contractor, who must rectify the non-compliance immediately or within a reasonable timeframe as agreed upon with the ECO. • An Environmental Audit Report, compliant with Appendix 7 of the NEMA EIA Regulations 2014 as amended, must be compiled by the ECO and submitted to the relevant parties as listed above. • Should a major change in water quality be identified, the source of the pollutant must be identified and rectified immediately. Rehabilitation measures may be required, which must be prescribed by the ECO in conjunction with a qualified aquatic specialist.

4.0. IMPACT MANAGEMENT ACTIONS

Mitigation measures provided in the table below have been formulated during the Environmental Impact Assessment process / Amendment applications to ensure that Seaton Estate is a sustainable development, as contemplated in the principles of NEMA. The actions aim to:

(i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; and
(ii) Comply with any prescribed environmental management standards or practices.

The tables below indicate the persons who will be responsible for the implementation of the mitigation measures / actions. Abbreviations provided below:

- Independent Environmental Control Officer *ECO*
- Engineer *ENG*
- Holder of Environmental Authorisation *DEV*
- Homeowners *HO*
- Architect *ARC*
- Contractors *CON*
- Landscaper *LAND*

4.1. PLANNING & DESIGN

It is noted that, at the time of writing this EMPr, the detailed planning and design phase for the eastern portion of Seaton (Figure 3) is complete. The table below is therefore specific to the western portion of the Seaton Estate (Figure 2).

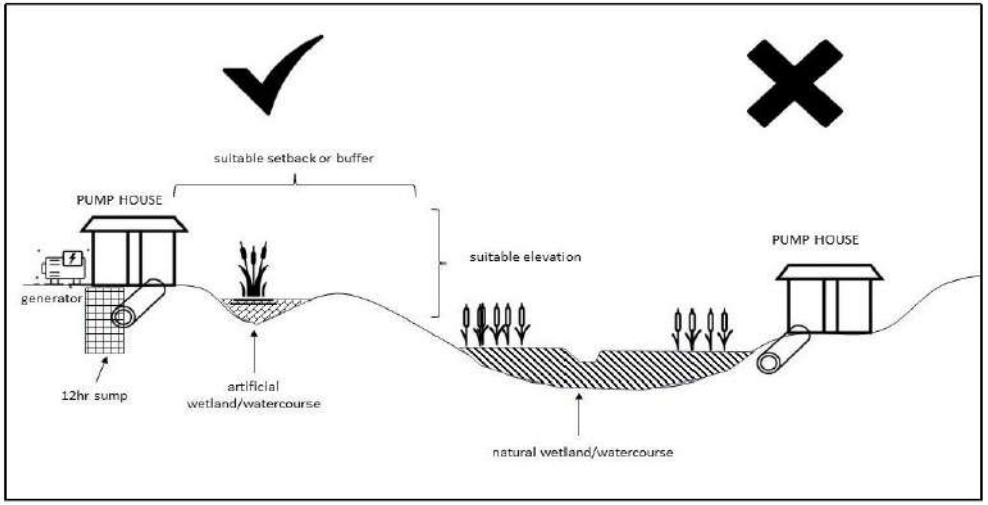
Table 4: Impact Management Actions to be Adhered to During the Planning & Design Phase of Seaton West (Figure 2).

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Earthworks on site creating platforms for development.	**Exposed soil susceptible to erosion resulting in sediment deposition into wetland systems reducing functionality (SDP, 2021).**	During excavation, sediment and other material have the potential to accumulate in low-lying portions of the site (i.e. wetland systems). Management interventions are therefore required to restrict sediment movement during construction. The following mitigation is proposed: • Final platform design must take into consideration the natural slope and contours of the site so that there are no unnecessarily steep slopes cut, exacerbating erosion.	ENG	
	Alteration of surface hydrology in terms of surface flows (SDP, 2021).	The stormwater disposal system, as per the SMA drawing #4226-001-410 must be substantially adhered to. The SWMP must include the following concepts: • The stormwater management plan must be implemented on site as soon as practically possible to reduce uncontrolled stormwater runoff into the surrounding environment. • Stormwater from all residential sites must be directed into a piped system which can accommodate significant rainfall events.	ENG	

		• There must be multiple stormwater discharge points into the valley lines to prevent point source erosion. • All stormwater headwalls must contain erosion control mechanisms (i.e. gabion baskets / reno mattresses). • All attenuation facilities must not be lined to encourage percolation of water.		
Densification of the site.	**Overall decrease in water quality in wetland systems (HGM 1 & HGM 3) reducing quality of water in downstream farm dam,**	From a design perspective, the following is required to reduce the likelihood of a decrease in water quality in the downstream wetlands. • Soap and other hydrocarbons (paint, chemicals etc.) must not be permitted to enter the stormwater system as this will result in "*dirty*" stormwater entering the wetlands. • All dirty water from kitchens and bathrooms must be directed into the sewer system and not stormwater. • Water from residential units (i.e. water features, car washing, ponds etc.) must be discharged in a controlled manner onto the natural ground and not onto road surfaces or into the piped stormwater system.	ENG & ARC HO	
	Visual impact on the adjacent Springvale Country Estate.	This is a permanent impact and cannot be completely mitigated. This impact has been reduced in the preferred amended layout by including the following in the design: • The larger residential erven have been positioned in the northern portion of the estate, which is visible to Springvale. • Inclusion of a 20m "*no development*" servitude along the northern boundary of Seaton West (shared boundary with Springvale). A mix of coastal forest species must be planted in this buffer. • The PUD sites / apartments must be adequately screened by planting a mixture of tree sizes and species informally (i.e. not in a row). Tree planting must be emphasised along the ridgeline facing Springvale. The following mitigation measures must be adhered to in the final layout: • No above-ground infrastructure must be constructed within the 20m Springvale "*no development*" servitude. • The architect must ensure that light pollution is kept to a minimum during the design of the residential units, street lighting and PUD sites. External lighting must not be obtrusive or a nuisance to the adjacent Springvale Country Estate.	DEV LAND LAND DEV ARC	
	Reduction in the Open Space System.	The overall area of continuous open space has decreased from approximately 44 hectares to 43.4 hectares in the amended layout. The amended open space system is still compliant with Condition 10.20 of the EA requires "*the open space system on the development property must be aligned to that of neighbouring properties*". The function of the Open Space System needs to be understood to effectively assess the significance of this decrease. The functions include: - Protection of ecologically sensitive areas (i.e. wetlands and associated buffers), - Physical and hydrological linkages with neighbouring properties;	DEV	

		- Percolation of rainwater maintaining groundwater levels; and - Corridors for fauna movement. Despite the 0.6ha reduction in area of open space, the overall functionality of the Open Space System is still achieved in the amended layout. The Open Space System aligns with the areas of ecological significance and maintains physical and hydrological linkages with all neighbouring properties. The decrease in area of the Open Space System has been rated as "*moderately*" severe without mitigation. With the re-vegetation of the open space in accordance with the Landscape Philosophy and Concept Master Plan, the connectivity of open space and faunal habitat will be improved on site. The final rating for the impact, after mitigation, is therefore rated as having "*very low*" significance.		
Increase in the number of people residing in the area.	Increase in traffic putting pressure on the existing road network.	The increase in number of people residing in the area will significantly increase traffic congestion on the local road network. Seaton falls within the local Roads Master Plan that has been developed for the Sheffield Beach area. Construction of the new N2 Sheffield Beach Interchange is scheduled to commence once all environmental approvals are in place. • Provided that the Roads Master Plan is implemented by the KwaDukuza Local Municipality, SANRAL, Department of Transport and the various developers, the traffic impact can be mitigated.	DEV	
	Increased reliance on the electricity supply in the Tinley Manor area.	Adamastor Consulting have confirmed that the development has an existing overhead line which is currently supplying the Manor house. There is an existing allocation of 500kVa. With the increase in density proposed, the electrical demand will increase to 900kVa. Discussions are underway with KwaDukuza Electrical Engineering Services Directorate to strengthen the entire electrical network in the area, including the network supplying Seaton, thereby providing "*more than sufficient capacity for this development in the medium term*"[1]. to assess the increase in electricity demand associated with the amended layout. The following mitigation measures are included to reduce the electricity demand and promote energy saving technology: • The developer must implement energy saving technology and equipment to reduce the electricity demand (i.e. solar water heaters, PV panels, LED technology etc.). • Streetlight luminaires within the development area must be LED Luminaires.	DEV & ARC	
	Increased pressure on the bulk potable water supply and	An Engineering Services Report (ESR) has been prepared by SMA Consultants. The total water demand anticipated for the development is 1.78Ml/day.	DEV & ENG	

[1] Adamastor Consulting cc "*Seaton West: Electrical Capacity*" letter dated 16th September 2021.

	sewerage disposal network in the Sheffield Beach area.	• Potable water will be provided to the development by Siza Water from the Tafeni Reservoir. • In an effort to reduce reliance on the municipal system, all residential units must include a rainwater harvesting tank. A total bulk sewer demand of 1.3Ml/day is anticipated. • All sewage generated will be discharge into an existing outfall sewer owned by Siza Water and treated at the Sheffield Wastewater Treatment Works. • Proposed water and sewer reticulation layouts are attached to the ESR. • To reduce the risk of the pump stations on nearby watercourses, the following design features must be included: - Since the pump station is reliant on electricity to drain the sump, a back-up generator must be included in the design to provide emergency power to the pump should there be an electricity outage. - The size of the sump must be increased to ensure additional emergency storage time (>1 hour) in the event of the back-up generator malfunctioning; and - The sump must be encased in concrete to reduce the risk of leaks.		
Sewer pump stations	**Change in downstream water quality associated with the operation of the sewerage pump stations (SDP, 2022).**	• The pump stations must be positioned as per the figure below (i.e. suitable setback / buffer from the natural watercourses, SDP 2022).  • A "*phyto remediation*" sump or wetland system may be employed down slope of the station. • Backup generators are to be included in the design of each pump station.	CON & ENG	

		• The two pump stations located along the western property boundary are to have a backup pump to ensure the neighbouring land use is not impacted by such pump failures. • All pump stations are to have sufficient capacity for 12 to 24 hours of storage. • No emergency discharge may be released from the two pump stations located along the western property boundary.		

4.2. PRE-CONSTRUCTION

It is noted that, at the time of writing this EMPr, construction has commenced in other areas of Seaton Estate. The table below is therefore applicable to those areas of the estate where construction has not yet commenced including the western portion of the Seaton Estate (Figure 2).

Table 5: Impact Management Actions to be Adhered to During the Pre-Construction Phase of Seaton.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Earthworks on site creating platforms for development.	**Exposed soil susceptible to erosion resulting in sediment deposition into wetland systems reducing functionality (SDP, 2021).**	During excavation, sediment and other material have the potential to accumulate in low-lying portions of the site (i.e. wetland systems). Management interventions are therefore required to restrict sediment movement during construction. The following mitigation is proposed: • The 15m wetland buffer must be clearly demarcated by the Contractor in collaboration with the Environmental Control Officer (ECO) prior to earthworks commencing on site. • Signs must be erected warning construction staff of the environmentally sensitive area and restrictions associated with it. • The ECO must carry out an environmental toolbox talk with the Contractor and all vehicle operators prior to earthworks commencing. The training must include the identification of the wetland areas and the associated restrictions (see Environmental Awareness Plan included in the EMPr).	CON & ECO DEV ECO	
Earthworks to create attenuation facilities and erosion control features within	**Construction staff littering and unintentionally disturbing the adjacent wetland.**	• The wetland and 15m buffer must be clearly demarcated prior to earthworks commencing on site (i.e. silt fences and signage). • The ECO must carry out an environmental toolbox talk with the Contractor and all vehicle operators prior to earthworks commencing. The training must include the identification of the wetland and the restrictions associated with the zone. • The wetland and 15m buffer must be treated as a No-Go area except during the construction of the stormwater management plan.	CON & ECO ECO CON	

the 15m wetland buffer.				
Densification of the site.	**Visual impact on the adjacent Springvale Country Estate.**	This is a permanent impact and cannot be completely mitigated. This impact has been reduced in the preferred amended layout by including the following in the design: • Inclusion of a 20m "*no development*" servitude along the northern boundary of Seaton West (shared boundary with Springvale). A mix of coastal forest species must be planted in this buffer. • A combination of tree sizes (10L, 20L, 50L and 100L) and species (indigenous evergreen, deciduous, pioneer) must be planted in the 20m buffer and along road verges. • The PUD sites / apartments must be adequately screened by planting a mixture of tree sizes and species informally (i.e. not in a row). Tree planting must be emphasised along the ridgeline facing Springvale. The following mitigation measures must be adhered to in the final layout: • Unless the area will be impacted by earthworks, trees must be planted in the Springvale "*no development*" servitude and along the ridgelines facing Springvale prior to the commencement of any earthworks in this section of Seaton West.	LAND	
Environmental Training	**Minimising environmental risk through training and awareness of environmentally sensitive areas.**	• All staff working on site must have basic environmental awareness training prior to construction commencing on site. • Environmental Awareness Plan (section 5.0.) must be implemented on site. • Staff must sign a training register.	CON	
Final layout plan	**Final layout compliant with authorisation and not encroaching into environmentally sensitive areas.**	• The layout of all roads, services and platforms must be pegged out and clearly demarcated. • The ECO must inspect the pegs prior to earthworks commencing on site to ensure compliance with authorised layout (Figures 2 - 4).	CON & ECO	
Sewer pump stations	**Change in downstream water quality associated with the operation of the sewerage pump stations (SDP, 2022).**	• During the construction phase water quality sampling should be conducted both upstream and downstream of each pump station, and depending on the input of the ECO, every 6 months during the operational phase. Parameters of concern include E. coli and Faecal coliforms.		

4.3. CONSTRUCTION

Construction is underway in some areas of Seaton Estate. The mitigation measures listed in Table 6 are applicable to the entire Seaton Estate development. Mitigation measures listed in Table 7 are specifically applicable to construction in the eastern portion of the Estate (Figure 3). Table 8 is applicable to construction in the western portion of the Estate (Figure 2). These are in addition to the measures listed in Table 6.

Table 6: Impact Management Actions to be Adhered to During Construction of the Seaton Estate.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Site Camp	**Placement of site camp to have minimal environmental impact.**	• Should a site camp be necessary, the site camp must be located at least outside of any environmentally sensitive areas or the Open Space System (Figure 5). • The site camp must be located on a flat portion of land and must include a parking area for vehicles. • Signage is to be erected outside site camps indicating Lot No. Activity, Contractor, Developer and relevant contact details of responsible person. • During the construction of individual homesteads / residential complexes, the site must be fenced with 1.8m bonnox fencing / woodpoles and gated. The fence must be clad with shade cloth or sacking.	CON	
Record Keeping	**Proof of safe disposal & sustainably sourced material.**	The following documents must be retained on site for auditing purposes: • Environmental Authorisation • Environmental Management Program • Environmental Audits for the site • A full inventory of all hazardous materials must be retained on site with the respective Material Safety Data Sheets • Safe disposal slips for waste (general, hazardous and chemical toilets) • Proof of raw material sourcing (i.e. building sand, gravel etc.) • Environmental training registers • Record of incidents on site, including photographs (if applicable) • Any other permits, licenses or approvals that may be applicable to the site.	CON	
Vehicles & Equipment	**Disturbance to areas adjacent to construction site and contamination of environment.**	• Major vehicle servicing is not permitted on site. Only emergency / minor repair work is permitted. • A drip tray must be used to capture any spills during emergency / minor repair work. • Construction vehicles must not be washed on site unless water can be captured in a sump and hydrocarbons / other contaminants removed prior to water being released into the surrounding environment.	CON	

		• No vehicles are permitted within the sensitive No-Go areas illustrated in Figure 5 (except during the construction of the stormwater attenuation facilities in the wetland buffer). • Vehicles must not exceed the Estate speed limit of 40km/h. • Roadways must be demarcated at site set up. No ad hoc roads must be constructed.		
Material Storage Areas & Stockpiles	**Sedimentation risk and unsustainable use of top soil.**	• Soil stockpiles must not exceed 2m in height, must be covered, or grassed to prevent erosion caused by exposure to heavy wind or rain. • Stockpiling of material must not take place on steep slopes where there is an opportunity for material to wash into the surrounding environment. • Where the slope is greater than 1:2, bunds must be positioned at 20m intervals at foot of stockpile. • Top soil stripped off the site must be stockpiled separately and used during rehabilitation / landscaping. • The top soil stockpile must be kept free of weeds and alien invasive species.	CON	
Erosion & Stormwater Management	**Sedimentation risk to downstream environment (including wetland area).**	• Blanket stripping of a site must not be undertaken as this will exacerbate erosion. Cane and ruderal vegetation on site must be maintained until landscaping / rehabilitation commences. • Temporary stormwater channels and protective measures must be established prior to earthworks taking place. • Areas more prone to erosion must be identified and additional measures put in place to control stormwater and erosion (i.e. sand bags, berms, stone pitching etc.). • During the excavation of trenches, excavated soil must be placed on adjacent ground above the trench (i.e. higher than the trench). • Silt fences must be installed below construction areas where water flow is evident. This is to attenuate flow and trap sediment. • Erosion control devices / silt fences must be monitored and maintained to reduce the build up of sediment. • Where required, contour drains and bunds must be kept intact until vegetative yield is sufficient to prevent soil slip and erosion. • Stormwater from individual homesteads / residential complexes must be directed into bunds / sumps. No direct disposal of stormwater onto adjacent properties or surrounding environment. • Energy dissipation mechanisms must be incorporated into stormwater systems (i.e. reno-mattresses, rocks etc.) • Signs of erosion must be addressed immediately to prevent further erosion from taking place.	CON	

		• Disturbed areas are more susceptible to the establishment of Alien Invasive Plants (AIP). On-going AIP control must be carried out in accordance with the Eradication of AIP Procedure (section 6.0). • Grassed road verges must be established once earthworks is complete. • Sods to be planted on exposed embankments to encourage vegetation growth.		
Waste Management	**General waste becoming a nuisance on site and blowing into environmentally sensitive areas / neighbouring properties.**	• A general waste skip / similar receptacle must be accessible to all construction sites within Seaton Estate. • General waste must be removed from site on a weekly basis to ensure there is no build up in the skip / waste receptacle. • All waste must be stored under cover to prevent rain ingress and/or waste from being blown around site. • No waste must be buried or burnt on site or dumped in environmentally sensitive areas (i.e wetland associated buffer area).	CON	
	Hydrocarbons or other liquids / chemicals entering the surrounding environment and wetland habitat reducing functionality.	• Reduce requirements for storage and use of noxious liquids (i.e. fuel) on site. • Potentially hazardous substances[2] to be stored in a fenced off area that is undercover to prevent contamination of rainwater. • A full inventory of all hazardous materials must be retained on site with the respective Material Safety Data Sheets. • The hazardous storage area must not be located within 15m of the wetlands. • All potentially hazardous substances must be stored, in a bunded area (110% capacity of largest container) with an impermeable surface to prevent soil contamination during handling. • No bulk storage of fuel on site (>30m^3). • Decanting of potentially hazardous substances must be carried out within the confines of a drip tray / similar or using a hand pump. • Hazardous waste must be disposed of at a registered hazardous landfill site.	CON	
	Construction staff using the surrounding environment as ablutions.	• Ablution facilities must be accessible to all construction workers. • No pit latrines are permitted on site. • All staff must utilise the ablution facilities provided and must not use the surrounding environment. • The ablution facilities must not be located on steep slopes, within environmentally sensitive areas or the Open Space System shown in Figure 5. • Ablution facilities must be checked regularly and kept in a clean state.	CON	

[2] Hazardous substances refer to substances scheduled in the Hazardous Substances Act (1973) and Hazardous Chemical Substances Regulations (1995) and include paint, oils, fuels, solvents, pesticides.

Spills & Incidents	**Hydrocarbons or other liquids / chemicals contaminating watercourses and the surrounding environment.**	• The ECO's environmental toolbox talk must include a spill response procedure and incident reporting so all staff know how to clean up minor and major spills (included in the Environmental Awareness Plan; section 5.0 of the EMPr). • Drip trays must be available near the hazardous storage area and where hazardous materials are being used on the site. • A Spill Kit / similar must be available near the hazardous storage area.	CON	
Dust & Emissions	**Dust & emissions becoming a nuisance on site and to nearby residents.**	• During high winds, dust supressing must take place using water carts / hose to prevent excessive dust on site. • Any fine materials stockpiled on site must be covered to prevent dust from being blown around. • Material transported to site on the back of trucks must be covered, • A complaints register must be maintained on site and any complaints received addressed timeously. • If dust becomes a nuisance, shade cloth and other screening techniques must be used to reduce dust from entering other properties.	CON	
Noise	**Noise becoming a nuisance on site and to nearby residents.**	• All construction vehicles must be well maintained to reduce noise on site. • All construction vehicles and equipment must be fitted with standard silencers. • No construction vehicles or machinery to operate outside of construction working hours (06:00 – 18:00). • A complaints register must be maintained on site and any complaints received addressed timeously.	CON	
Conduct	**Construction staff becoming a nuisance to neighbouring homeowners.**	• No construction work must take place between 06:00 and 18:00. • Neighbours to be advised prior to work being done outside the above times. • All construction staff must enter and leave the Estate through the main entrance off the P228. • No open fires are permitted on site. • No poaching of fauna or removal of vegetation from site.	CON	
Cultural / Heritage	**Items of historical, archaeological or cultural significance destroyed or disturbed during excavations.**	• During earthworks, should any objects with historical, archaeological or cultural significance be uncovered, all work in this area must cease and the heritage authority, AMAFA, notified. • Objects with historical, archaeological or cultural significance must not be destroyed or removed from site without prior permission from AMAFA. • Should any human remains be discovered, all work in this area must cease and the South African Police contacted for further direction.	CON	
Palaeontological / Fossils	**Fossils destroyed or disturbed during excavations.**	• During earthworks, the following procedure must be adhered to if fossils are discovered (see photographs provided below for examples of the type of fossils that could be found on the site):	CON & ECO	

		- When excavations begin the rocks must be given a cursory inspection by the ECO or designated person. Any fossiliferous material (shells, plants, insects, bone, coal – see Figure 6) must be put aside in a protected place. This way construction activities will not be interrupted. - Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (see below). - Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment. - If there is any possible fossil material found then a qualified palaeontologist, must visit the site to inspect the selected material. - 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 no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils. - If no fossils are found and the excavations have finished then no further monitoring is required.		

Figure 6: Example of fossils from the Vryheid Formation in the Main Karoo Basin and Maputaland Group (a) Examples of some shallow marine shells, oyster on the lower right and (b) Photographs of fossils from the Vryheid Formation (source: Proff. Marion Bamford).

Table 7: Impact Management Actions Specifically Applicable to Construction in the Eastern Portion of Seaton Estate (Figure 3).

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
The cluster housing units will result in a larger hard panned surface area.	**The increase in hard surfaces results in the increase of both the volume and velocity of stormwater runoff into watercourses leading to erosion and sedimentation of watercourses. The increase in hard surfaces also has the potential to decrease groundwater recharge which results in more intense flood events downstream in the catchment.**	Mitigation measures provided in the Ecological Assessment include: • Ensure the application of open space within complexes and related areas. • Apply water harvesting and energy dissipation mechanisms in stormwater systems (see below from the engineer). • Establish sediment capture systems. • Establish discharge into constructed wetlands. • Regular monitoring of open water systems using physio-chemical parameters. During the operation of the estate, the ECO must take bi-yearly ambient water quality samples from watercourses within the study area. As per SMA Consultants Stormwater Management Plan (SWMP): • Stormwater is discharged into the natural valley lines where stormwater attenuation ponds are proposed. • The location of the stormwater attenuation ponds remains the same as per the originally authorised layout. • Erosion protection must be provided in the form of gabion structures and reno-mattress structures.	CON / ECO	
Minor changes in road network.	**Minor change in hard panned areas. Minor to moderate change in stormwater infrastructure (possible increase in pipe diameter etc.).**	Mitigation measures provided in the Ecological Assessment include: • Increase surface run off in and around roadways using materials such as grass blocks. • Use sediment trapping systems to capture and slow surface water discharge. • Discharge using percolative methods, where possible. • Establish discharge into constructed wetlands. • Regular monitoring of open water systems using physio-chemical parameters. During the operation of the estate, the ECO must take bi-yearly ambient water quality samples from watercourses within the study area.	CON / ECO	
Decrease in development footprint.	**Minor change in hard panned surfaces, particularly around Eastern wetland system. Retention of present surface and sub surface hydrology associated with site**	This is a positive impact. Management interventions provided in the Ecological Assessment include: • Ensure continued vegetative cover of area as grassland or landscaped feature. • Manage erosion if and where this arises. • Visual inspections must take place by the ECO during auditing.	DEV / ECO	

Increased number of residential units constructed in the eastern portion of the Seaton Estate	**Increase in number of people residing in the area resulting in an increase in traffic, putting pressure on the existing road network.**	• The Traffic Impact Assessment (TIA) carried out by SMEC South Africa (Pty) Ltd, which forms part of the greater Strategic Transportation Study for the KwaDukuza Municipality must be adhered to[3]. • To provide access to the eastern portion of the estate, the south facing ramps of the proposed new Sheffield Beach interchange must be constructed. • Table 10.1 in the TIA summarises the road upgrades that will take place as development in the area rolls out. Scenario 3, when Phase 2 & 3 of the Seaton Residential Estate come into operation, triggers the construction of the south facing ramps at the N2 Sheffield Interchange. The developer is fully responsible for the upgrades required under this scenario. • A number of other road upgrades are required for Scenario 4, which takes into account all long-term development plans in the area (Seaton Estate and others). The cost of these upgrades will be shared amongst all developers within the study area. • Public transport laybys designed to the road authority standards must be provided on both sides of the access to the Seaton development. • Non-motorised transport facilities (i.e. pedestrian walkways) along the public transport routes and in the vicinity of the public transport laybys / stopping area was recommended by the traffic specialist.	DEV	
Increased number of residential units constructed in the eastern portion of the Seaton Estate	**Increase in number of people residing in the area putting pressure on the electricity supply in the Tinley Manor area.**	• The Electrical Development Network Plan for the Tinley Manor / Salt Rock area must be adhered to[4]. The electrical supply plan for the Seaton Estate uses a phased approach with certain infrastructure being constructed / upgraded as the development rolls out. • The development will receive electricity from KwaDukuza Municipality, who are responsible for the reticulation, distribution and maintenance of electrical infrastructure. • KwaDukuza Municipality Electrical Engineering Business Unit has approved the required electrical demands for the entire Seaton Estate provided that an electrical load growth graph based on anticipated sales be shared so that the municipality is aware of the phasing updates. • Existing infrastructure will be utilised to its maximum capacity and be upgraded where practical. • Cables will be run from the Palm Lakes substation to strategically placed distributor substations within the Seaton Estate. The existing load off the overhead lines will then be transferred to the new cables. This load is sufficient to accommodate the load growth up to 2030 / 31.	DEV	

[3] SMEC South Africa (Pty) Ltd: Traffic Impact Assessment for the Proposed Seaton Estate Phase 1B (January 2020).

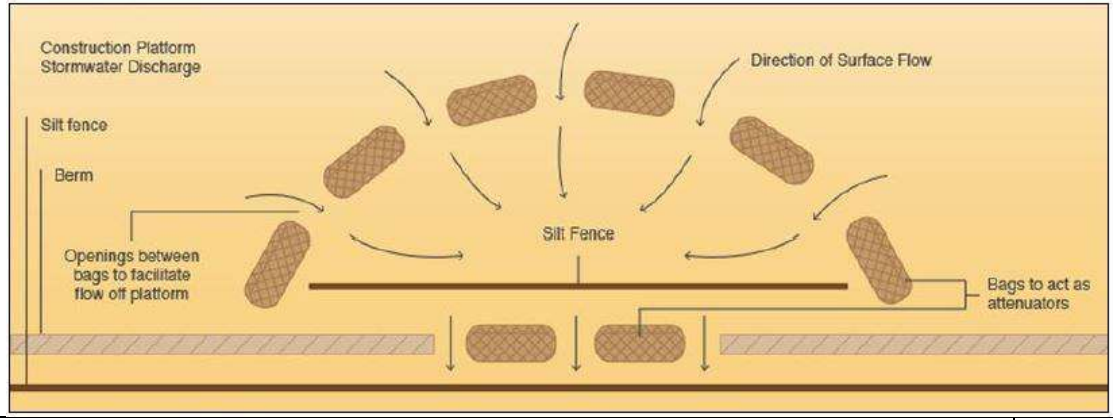
[4] Adamastor Consulting: Tinley Manor / Salt Rock, 11kV Electrical Network Development Plan (December 2019).

		• Ultimately a new Major Substation (132/11kV) substation is required (negotiations under way with KwaDukuza Municipality and Eskom for the Tinley Manor Major Substation). • Please refer to section 6.3 of the Electrical Network Development Plan for a summary of the 11kV network development.		
Increased number of residential units constructed in the eastern portion of the Seaton Estate .	**Increase in number of people residing in the area putting pressure on the bulk potable water supply in the Sheffield Manor / Salt Rock area for drinking, cleaning and landscaping purposes.**	As per the SMA Engineering Services Report prepared for the amendment application (November 2019), the following is to be adhered to: • The total anticipated water demand for the amendment area (including Seaton Bay) is 2.65Ml/day. • iLembe Municipality and Siza Water will provide the bulk supply for this development. • The eThafeni reservoir is currently undergoing improvements and has sufficient capacity to service this phase of the development. • Size Water are also in the process of exploring other options for bulk water supply to the growing Tinley Anor / Salt Rock area (construction of a second reservoir on site at Seaton or on the South Banks Development north of Seaton Estate). Mitigation measures provided in the Ecological Assessment to reduce the demand on municipal potable water for landscaping purposes includes: • The installation of water tanks in order to 'harvest' rainwater from each residential erven.	DEV	
Increased number of residential units constructed in the eastern portion of the Seaton Estate.	**Increase in number of people residing in the area putting pressure on the bulk sewerage infrastructure and Waste Water Treatment Works (WWTWs) in the Sheffield Manor area. Should there be insufficient capacity at the WWTWs, there is a risk that the effluent discharged from the WWTWs into the uMhlali River is of poor quality resulting in contamination of surface water and uMhlali River estuary.** **An overload of the Seaton sewer network may also**	As per the SMA Engineering Services Report prepared for the amendment application (November 2019), the following is to be adhered to: • The proposed sewer reticulation, which will connect to the authorised sewerage infrastructure proposed at Seaton Bay (down gradient of the amendment area). The total bulk sewer demand for the amendment area (including Seaton Bay) is 1.94Ml/day. • All residential erven will be provided with a link to water borne sewers. • Siza Water are responsible for the provision of waterborne sewer reticulation up to the project boundary. • SMA Consultants are in contact with Siza Water who have confirmed that the development is located within the Concession Area of Siza Water, who will be responsible for providing a water borne sewerage connection to the entire development. • Considering the topography of the site, all sewage will gravitate to the Seaton Bay Development area. • The sewage will then be pumped west, back through the development and ultimately discharge into the existing outfall sewer belonging to Siza Water. • All sewage will then gravitate to the existing Sheffield Wastewater Treatment Works (WWTW) owned by Siza Water. • The current capacity of the plant is 6Ml/day, which is sufficient enough to handle the initial flows generated by the Development. The WWTWs would need to eventually be upgraded to accommodate the proposed flows for the entire Development. As per the Siza Water letter, the applicant's engineers are liaising with Siza Water regarding the	DEV	

	result in leaking or overflowing with possible contamination of nearby watercourses.	Master Plan, which will be carried out in phases as per Figure 1, and associated engineering services demands. Mitigation measures provided in the Ecological Assessment to reduce the impact of contamination of the watercourse include: • During the operation of the estate, the ECO must take bi-yearly ambient water quality samples from watercourses within the study area.		

Table 8: Impact Management Actions Specifically Applicable to Construction on Seaton West (Figure 2).

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Earthworks on site creating platforms for development.	**Clearance of indigenous vegetation from within the KwaZulu-Natal Coastal Belt Grassland (CB3) ecosystem.**	The proposed development footprint fits largely within the currently authorised footprint but better reflects the latest wetland delineation and associated buffer. The total amended footprint is 43.64 hectares and is comprised of: - Secondary grassland described by the ecologist as having low ecological value due to the historical long-term use of the site for sugarcane farming (35.41 ha); - Alien invasives (planted for windbreaks and naturally occurring in previously disturbed area 1.23 ha); and - Transformed area (existing equestrian facilities, planted lawn grass etc.; 7 ha) The severity of the impact and significance after mitigation is unlikely to change from the currently authorised footprint due to the low ecological value of the vegetation being cleared. The following is required to manage this impact: • Clearance of vegetation must be done in phases to ensure soil stability is not compromised. • The establishment and growth of exotic vegetation must be constantly managed in disturbed areas in accordance with section 5.4.2 of the EMPr. • The Landscaping Philosophy must be adhered to (attached to the EMPr) to ensure that the open space system is managed and re-vegetation, improving biodiversity on site.	CON CON LAND	
	Exposed soil susceptible to erosion resulting in sediment deposition into wetland systems reducing functionality (SDP, 2021).	During excavation, sediment and other material have the potential to accumulate in low-lying portions of the site (i.e. wetland systems). Management interventions are therefore required to restrict sediment movement during construction. The following mitigation is proposed: • Establish cut off drains above and below excavations. • Temporary stormwater control measures must be implemented prior to earthworks commencing on site to retard flow and attenuate water (Figure 7). This includes the identification of areas susceptible to erosion (i.e. valley lines and steep slopes), the strategic installation of silt fences to prevent wash away and the	CON	

		establishment of reno mattresses / gabion baskets / other velocity reducing devices to reduce overland flow which results in sediment wash away. These temporary control measures can be erected in the buffer zones. • Excavated soils must be returned to trenches and compacted prior to earthmoving machinery vacating the site. • Any eroded areas must be addressed and rectified when they arise to prevent further erosion from occurring. • Exposed banks must be vegetated as soon as practicably possible once earthworks in the area are complete. • No earthworks associated with the creation of the residential platforms must take place within the 15m wetland buffer. • No heavy vehicles, material storage areas or stockpiles are permitted within the wetlands or 15m buffer area. • Stockpiles to be managed to prevent runoff during high precipitation.		
		Figure 7: Diagram Illustrating the Placement of Temporary Stormwater Controls (Source: SDP, 2021). 		
Earthworks to create attenuation facilities and erosion control features within the 15m wetland buffer.	**Compaction of soils in wetland buffer decreasing percolation and increasing the risk of sediment transport into the downstream wetlands.**	The following mitigation measures must be put in place to manage and reduce the severity of this impact during the construction of the stormwater management infrastructure within the wetland buffers: • No stormwater infrastructure is permitted within wetland. • Where construction of stormwater infrastructure is required in the 15m wetland buffer, the smallest practical machinery / equipment must be used to minimise the disturbance footprint. • Vehicles entering the 15m wetland buffer must be limited. • There must be no ad-hoc roads created in the 15m wetland buffer (i.e. one designated road to and from the area of disturbance).	CON	

		• All stormwater attenuation facilities must be unlined to promote percolation and groundwater recharge. • The ECO must advise on suitable hygrophilous species to be planted in the attenuation features.	ENG ECO	
	Construction staff littering and unintentionally disturbing the adjacent wetland.	• The wetland and 15m buffer must be treated as a No-Go area except during the construction of the stormwater management plan. • All waste generated on site must be disposed of in the designated waste management area to ensure that it is not blown around the site into the environmentally sensitive areas. • Toilets must not be located within the 15m wetland buffer or near steep slopes where there is a risk of tipping over. • Staff must use the toilets provided and must not use any other areas on site as toilet facilities.	CON	
Sewer pipelines crossing wetlands.	**Change in water quality associated with the operation of sewer pipelines (SDP,2022).**	• Where trenches are dug for the establishment of sewer pipelines, the wetlands must be reinstated as quickly as feasibly possible. • Rehabilitation measures as per the Wetland Rehabilitation Plan must be implemented. • Trenches within the wetland are to be manually dug to avoid the use of heavy machinery within the wetland. • Regular alien plant clearance/at area of disturbance.	CON & ECO	

4.4. REHABILITATION / POST CONSTRUCTION

Once construction is complete in a certain area of Seaton (i.e. Contractor completes construction of a residential unit), the Contractor and ECO must ensure that the mitigation measures listed in the table below are adhered to. This will ensure that there will be no residual impacts on the environment remaining once construction is complete. Rehabilitation will therefore take place in a phased manner concurrently with construction. Mitigation measures in this table are applicable to all areas within Seaton Estate.

Table 9: Impact Management Actions to be Adhered to Once Construction is Complete in a Certain Section of the Seaton Estate.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Post-Construction Audit	**To ensure the site is stable and there are no outstanding environmental non-compliances that need to be corrected by the Contractor.**	• The ECO must carry out a post-construction inspection of the site once construction in certain areas of the Estate is complete. • Clearance from the ECO must be obtained to ensure there are no outstanding environmental non-compliances prior to the Contractor vacating the site. • The following areas must be audited by the ECO in the post-construction inspection: - No waste / litter remaining on site; - There is no evidence of spills or building rubble remaining on site;	CON & ECO	

		- There are no left over building material remaining on site; - All exposed surfaces have been rehabilitated / landscaped to avoid sediment wash away; - Stormwater management has been formalised; - There is no evidence of erosion; and - No environmentally sensitive areas, indicated in Figure 5, have been damaged. If damage is evident, rehabilitation measures must be prescribed by the ECO and carried out by the Contractor.		
Densification of the site.	**Visual impact on the adjacent Springvale Country Estate.**	This is a permanent impact and cannot be completely mitigated. This impact has been reduced in the preferred amended layout by including the following in the design: • Inclusion of a 20m "*no development*" servitude along the northern boundary of Seaton West (shared boundary with Springvale). A mix of coastal forest species must be planted in this buffer. • A combination of tree sizes (10L, 20L, 50L and 100L) and species (indigenous evergreen, deciduous, pioneer) must be planted in the 20m buffer and along road verges. • The PUD sites / apartments must be adequately screened by planting a mixture of tree sizes and species informally (i.e. not in a row). Tree planting must be emphasised along the ridgeline facing Springvale. The following mitigation measures must be adhered to in the final layout: • Unless the area will be impacted by earthworks, trees must be planted in the Springvale "*no development*" servitude and along the ridgelines facing Springvale prior to the commencement of any earthworks in this section of Seaton West. • All open space must be vegetated in accordance with the Landscape Philosophy and Concept Master Plan and Plan.	DEV & LAND	
Rehabilitation of Open Space System.	**Re-establish indigenous vegetation and faunal habitat. This is a positive impact.**	Through the rehabilitation of degraded wetlands on site, indigenous vegetation and faunal habitat will be re-established in Seaton West. • Rehabilitation must be carried out as per the site-specific Rehabilitation Plan attached to the EMPr. The Rehabilitation Plan is in accordance with Condition 10.33 and 10.34 of the Environmental Authorisation. • The open space system associated with Seaton West (Figure 2) must be planted in accordance with the Landscape Philosophy and Concept Master Plan prepared by Land Art Studio and attached to the EMPr. • No planting of exotic botanical species. • As per discussions with the adjacent landowner, HGM 3d (shown in Figure 5), will be allocated as a "no go" area during operation to prevent residents from traversing through the wetland, walking dogs etc. This must be incorporated into the Body Corporate Rules.	ECO & LAND	

	Rehabilitation of wetland areas	• The layout of the Seaton Residential Estate has taken into consideration the location of delineated wetlands which will be rehabilitated as an ecological feature of the estate. • Wetlands within the estate must be rehabilitated to improve the current functionality. This rehabilitation must be carried out by a wetland specialist or under the supervision of a wetland specialist. • As per discussions with the adjacent landowner, HGM 3d (shown in Figure 5), will be the first focus area when the Wetland Rehabilitation Plan is implemented. • A method statement must be submitted to the ECO prior to any rehabilitation work commencing on a wetland system. The method statement must include the measures stipulated in the site specific Wetland Rehabilitation Plan prepared by SDP and attached to the this EMPr. This includes: - Sculpting and restoration of the natural morphology of wetlands, where they have been infilled on account of agricultural and other activities; - Re-establishment of vegetation within the wetland environments on site, through control of exotic plant species within these areas, as well as the occasional planting of horticultural specimens; and - Maintain vegetated open space system, to address surface water flows within the catchment.	CON & ECO	
Earthworks on site creating platforms for development.	**Alteration of habitat and faunal ethos (SDP, 2021).**	It is the change in sediment transport, surface flow dynamics and increased dust associated with the stripping of the site, that may give rise to the alteration of habitat once earthworks commence[5]. Mitigation measures for these specific indirect impacts are provided in the EMPr however the overall alteration of habitat within the development footprint is inevitable and cannot be fully mitigated. The alteration of habitat and faunal ethos will be alleviated during the rehabilitation phase where the following is applicable: • Once earthworks are complete in a section, exposed banks must be vegetated as soon as practicably possible. • The 15m wetland buffer and all open space areas within Seaton West must be maintained as per the Landscape Philosophy and Concept Master Plan (attached to the EMPr).	CON DEV & LAND	

[5] Section 7.2 of the SDP Ecological Assessment (2021).

4.5. OPERATION

Provided that the above mitigation measures /actions are adhered to, the operational phase of Seaton Estate will have a low impact on the surrounding environment. Table 10 provides mitigation measures which are ongoing through-out the lifespan of the project and are applicable to all areas within Seaton.

Table 10: Impact Management Actions to be Adhered to During the Operational Phase of the Seaton Estate.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Increase in hard surfaces on the property.	**Alteration of the local hydrological regime (SDP, 2021). Increase in the velocity and volume of stormwater runoff into wetlands leading to erosion and sedimentation. Potential to decrease groundwater recharge and intensify flood events downstream.**	There will be an increase in hard surfaces resulting in a change in surface runoff associated with the establishment of roadways and infrastructure. This impact has been avoided and minimised in the design of the preferred amended layout. • The engineer has utilised the currently authorised attenuation facilities as well as introducing other attenuating grass swales outside wetland areas. As per the recommendations made by the wetland specialist, stormwater will be piped into these grassed swales to reduce velocity and increase percolation prior to the stormwater entering the wetland system. • In the preferred layout, all property boundaries have been shifted outside of the 15m wetland buffer (i.e. removal of "*no development*" servitudes on the properties). This reduces the risk of individual landowners unintentionally developing within the wetland buffer zones during the operational phase of the Estate. The entire open space system is under the control of the Homeowners Association who are responsible for the implementation of the wetland rehabilitation plan (attached to the EMPr). • A site visit was undertaken on the 02nd November 2021 with Mr Milstead and the engineer. The preferred amended layout (dated November 2021) accommodates Mr Milsteads comments with the distance between the wetland and the property boundaries on the southern side of wetland HGM 3 increasing and the number of properties on this side of the wetland decreasing. The following must be adhered to during the operational phase of the development so that the hydrology of the site remains intact (i.e. as per the pre-development state): • Stormwater runoff from hard surfaces must not be discharged directly into the valley lines / wetland systems but must be directed into the piped system to allow for free flow of water beneath roads. • All precipitation must be encouraged to percolate into the surrounding soils through the use of grass swales / furrows and unlined attenuation features (i.e. groundwater recharge).	DEV & ENG ENG ENG ENG & ARC LAND DEV & HO	

		• Permeable paving is encouraged where large hard surfaces are proposed (i.e. parking areas). • All open space areas must be vegetated to decrease hard panning wherever feasible. • The holder of the Environmental Authorisation as well as the individual property owners within Seaton West are bound to the Landscape Philosophy and Concept Plan attached to the EMPr.		
Densification of the site.	**Overall decrease in water quality in wetland systems (HGM 1 & HGM 3) reducing quality of water in downstream farm dam,**	• The wetland specialist recommends that water quality sampling be conducted upstream and downstream of Seaton West. This monitoring includes the following: ▪ Annual water quality samples must be taken from HGM 1 & HGM 3 (see Figure 5) at the furthest points downstream of the site. The following parameters must be recorded: Faecal coliforms, *E.coli,* N & P, Ammonia and pH. ▪ Water quality samples to be taken upstream and downstream of sewer pump stations every 6 months (frequency to be monitored by ECO). • A wetland specialist is to provide comment on the Present Ecological State (PES) of HGM 1, HGM 2 and HGM 3 in Seaton West on an annual basis to ensure that there is no degradation of the wetland condition. The PES score should improve over time as the rehabilitation of the site is carried out (see baseline results under Table 3). • To further protect the wetland systems during operation, phytoremediation systems must be established at all stormwater outlet points under the guidance of the ECO. The ECO to advise on what species must be planted to reduce sediment from entering the wetland system and remove excess nitrates.	DEV, HO & ECO	
	Visual impact on the adjacent Springvale Country Estate.	This is a permanent impact and cannot be completely mitigated. This impact has been reduced in the preferred amended layout by including the following in the design: • The larger residential erven have been positioned in the northern portion of the estate, which is visible to Springvale. • Inclusion of a 20m "*no development*" servitude along the northern boundary of Seaton West (shared boundary with Springvale). A mix of coastal forest species must be planted in this buffer. • A combination of tree sizes (10L, 20L, 50L and 100L) and species (indigenous evergreen, deciduous, pioneer) must be planted in the 20m buffer and along road verges. • The PUD sites / apartments must be adequately screened by planting a mixture of tree sizes and species informally (i.e. not in a row). Tree planting must be emphasised along the ridgeline facing Springvale. The following mitigation measures must be adhered to in the final layout:	DEV & HO	

		• No above-ground infrastructure must be constructed within the 20m Springvale "*no development*" servitude. • Unless the area will be impacted by earthworks, trees must be planted in the Springvale "*no development*" servitude and along the ridgelines facing Springvale prior to the commencement of any earthworks in this section of Seaton West. • All open space must be vegetated in accordance with the Landscape Philosophy and Concept Master Plan and Plan. • The architect must ensure that light pollution is kept to a minimum during the design of the residential units, street lighting and PUD sites. External lighting must not be obtrusive or a nuisance to the adjacent Springvale Country Estate.		
	Maintenance of the Open Space System through the centre of the Estate.	• The open space system is shown in green in Figure 5. • The aim of this open space is for an ecological corridor to be maintained through the centre of the estate for fauna and avi-fauna to utilise. The open space system will also ensure that certain ecological services are retained during the operation of the estate. • A link must therefore be retained from the underpass underneath the N2 highway to the ocean. • Apart from the authorised roads and services constructed across the open space system, no other infrastructure must be constructed in this system without prior approval from EDTEA.	DEV & LAND	
	Wetlands	• During the operation of the estate, the ECO must take bi-yearly ambient water quality samples from watercourses within the study area. • Should a decrease in water quality be detected, the source of the pollution must be identified and the affected area remediated according to recommendations provided by the wetland specialist. • Erosion protection features installed on the site must be checked by the body corporate to ensure, they continue to perform their function during the operational phase of the project. • Any maintenance on the structures that triggers a Listing Notice not covered in the Environmental Authorisation must only take place once approval has been received from EDTEA. • Contractors working within 32m of the wetlands, must adhere to the following: - Spill kits must be available to ensure that any fuel or oil spills are clean-up and discarded correctly; - Access of vehicles through the wetland is not permitted; - Sanitary facilities and ablutions on the site must be provided for all personnel throughout the project area. Use of these facilities must be enforced; - Any soil and material must not be stockpiled within 32m of the wetlands.	ECO, DEV & HO	

		- 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 must take place; and - All waste generated on-site during construction must be managed and removed from site by the Contractor.		
Increase in the number of people residing in the area.	**Increased pressure on the bulk potable water supply and sewerage disposal network in the Sheffield Beach area.**	• To reduce the risk of the pump stations on nearby watercourses, the following operational management measures must be adhered to: - An alarm must be installed on back-up generator notifying the HOA when sump is reaching critical capacity. - Contact details for an emergency honey sucker contractor must be kept on record in the event of an emergency where the sump is not draining (i.e. electricity outage, failure of back-up generator and sump reaching capacity despite additional storage space); and - The HOA must regularly inspect and routinely maintain all sewerage infrastructure to prevent any leaks from entering watercourses in the long-term (i.e. in accordance with the Monitoring and Auditing Plan approved by DWS as part of the WULA).		

5.0. ENVIRONMENTAL AWARENESS PLAN

This Environmental Awareness Plan describes the manner in which the holder of the Environmental Authorisation must inform all Contractors and employees of the environmental risk which may result from their work; and that the risks must be dealt with to avoid pollution or the degradation of the environment.

5.1. INDUCTION

All Primary Contractors working within Seaton Estate must receive a copy of the Environmental Awareness Plan and sign the register attached stating that they have received a copy of the EMPr and are aware of the environmental risks. Contact details for the Environmental Control Officer (ECO) must be provided below if Contractors require any clarification or assistance with the demarcation of sensitive areas (shown in Figure 5).

Table 11: Important Contact Information.

Designation	Company	Contact Person	Contact Details
Holder of the Environmental Authorisation	Sherpa Trade & Invest 31 (Pty) Ltd	As per the requirements of the Protection of Personal Information Act (POPI), contact details to be provided prior to construction.	
Seaton Estate Manager	Sherpa Trade & Invest 31 (Pty) Ltd		
Environmental Control Officer	SDP Ecological and Environmental Services		
Landscaper	Land Art Studio		
Consulting Engineer	SMA Consultants		

5.2. ENVIRONMENTALLY SENSITIVE AREAS

Please refer to section 1.3 of the EMPr and Figure 5, which provides a description of the environmentally sensitive areas associated with eaton Estate. These areas must be demarcated and avoided during construction. Contractors must be aware of the primary Impact Management Outcome for the Estate, which is ***to create a sustainable development by avoiding ecologically sensitive areas and retaining open space linkages.***

5.3. BASIC ENVIRONMENTAL TRAINING POINTS

All staff working within Seaton Estate must receive basic environmental training, which includes the items listed below. Please note that the ECO is available to conduct environmental training should the Contractor prefer.

- Context of Seaton Estate and the applicability of the EA and EMPr.
- The location of environmentally sensitive features within the Estate (Figure 5).
- Restrictions associated with the environmentally sensitive features (i.e. buffers, open space linkages, vehicle no-go areas etc.)
- Waste management (general & hazardous).
- No cement mixing directly on exposed soil outside of construction footprint.
- Management of hazardous substances (paint, oil, drip trays, spills etc.).
- Sanitation (i.e. the use of toilets).

5.4. PROCEDURES FOR HANDLING ENVIRONMENTAL RISKS

All construction staff working within Seaton Estate must be aware of the procedures listed below.

5.4.1. SPILL RESPONSE[6]

In the event of a spillage, the following procedure must be adhered to so that there is minimal impact on the surrounding environment. Diesel and oil are the most likely hydrocarbons that will be spilled on the site.

1. **ASSESS** THE RISK
    - WHAT was spilled; and
    - HOW MUCH was spilled.

2. SELECT THE RELEVANT PERSONAL PROTECTIVE EQUIPMENT **(PPE)**

3. **CONFINE** THE SPILL
    - Block, Divert away from sensitive environmental areas and confine spill.
    - Use absorbents or boom in Spill Kit
    - Stop the flow of the spill.

4. **STOP** THE SOURCE

5. EVALUATE THE SPILL AND IMPLEMENT APPROPRIATE **CLEAN UP**
    - Re-assess the spill and decide on most appropriate method of clean up.
    - Absorb spill using materials in Spill Kit or soil / wood chips.
    - Using a broom, rag or other material, scrub the impacted area or using a spade, dig out the contaminated soil.

6. **DECONTAMINATE**
    - All PPE must be removed and disposed of as hazardous waste if contaminated.
    - All rags / materials used during the clean up as well as the actual spilled material must be disposed of as hazardous waste.

7. **REPORT**ING
    - Responsible person to determine if the spill constitutes an “incident”, see definition below.
    - All incidents must be reported as per the procedure outlined in section 5.4.3.

[6] Seven Step Spill Procedure Accessed from Border Hazmat: Specialised Environmental Cleaning (http://borderhazmat.co.za/7-step-spill-procedure/). Accessed on 12th March 2021.

5.4.2. ERADICATION OF ALIEN INVASIVE PLANTS

Alien Invasive Plant (AIP) species rapidly establish in disturbed areas due to the lack of competition from other indigenous species. AIP species rapidly colonise and area and can spread to other areas within Seaton Estate. It is therefore important for construction staff to receive some training on how to identify and remove AIPs before they become a nuisance and negatively impact the rehabilitation efforts underway within the study area. The list below can also be used by homeowners and the Seaton Homeowners Association when eradicating AIP species during the operational phase of the development.

Notes:

- *Mechanical removal of AIPs (i.e. hand pulling / slashing) is preferred above chemical control especially in the No-Go areas / Open Space System.*
- *All mixes given as a percentage (ml per 100 l water/diesel).*
- *Apply methods either by species or by area i.e. multiple areas, one species or one area, multiple species.*
- *Autumn and winter - basal stem and cut stump treatments, no foliar spraying.*
- *Spring and summer - foliar spraying can be done on suitable plants. Rule of thumb - don't spray anyting over 1.5 m tall. Spray during the morning (8 am to 11 am) during calm conditions.*
- *NB PPE when spraying - rubber gloves, goggles, respirator, apron/chemical overall, rubber boots.*
- *NEVER use diesel for foliar application.*
- *If in doubt check the herbicide label.*
- *Follow up treatment/clearance is essential for effective AIP management.*

Table 12: Alien Invasive Plant Management at Seaton Estate[7].

	Species	Common Name	Category (NEMBA)	Size class	Mechanical control	Chemical control	Special considerations	Photographs
Terrestrial AIPs	***Ageratum conyzoides***	Invading ageratum	1b	All plants	Hand pull, slash, mow regularly	Folair spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		

[7] Information in the table has been obtained from SDP: Ecological and Environmental Services.

	Caesalpinia decapetala	Mauritius thorn	1b	Small plants (<1 m)	Hand pull, slash	Folair spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
				Large plants (>1 m)	Slash and cut, pull up root.	Folair spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%). If plants are higher than 1.5 m, cut back and spray regrowth when 0.5 m high.		
	Cestrum laevigatum	Ink Berry	1b	Small plants (<1 m)	Hand pull, slash.	None		
				Large plants (>1 m)	Slash and cut, pull up root.	Treat cut stump with 1.0% Triclopyr (Garlon 480) in diesel or water with adjuvant (Actipron Super @ 0.5%). Basal stem application with 1.0% Triclopyr (Garlon 480) in diesel.		
	Chromolaena odorata	Triffid Weed	1b	Small plants (<1 m)	Hand pull, slash, mow.	Foliar spray 0.375% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
				Large plants (>1 m)	Slash and cut, pull up root.	Treat cut stump with 1.0% Triclopyr (Garlon 480) in diesel or water with adjuvant (Actipron Super @ 0.5%)	**To address dense infestations:** 1) cut back plants and treat stump during winter 2) treat regrowth with a foliar spray once spring regrowth has occurred (new growth approx 0.5m in height). Use dye to mark sprayed plants.	

	Datura stramonium	Common thorn apple	1b	All Plants	Hand pull	Folair spray Glyphosate (Springbok 360 SL) @ 2l per Ha.	Hand pulling should be sufficient on smaller properties.	
	Grevillea robusta	Silky oak	3	Small plants (<1 m) and coppice	Hand pull and slash	Try: foliar spray 0.75% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
				Large trees and saplings > 1 m	Fell or ring bark	Try: Treat cut stump with 2.0% Triclopyr (Garlon 480) in diesel or water with adjuvant (Actipron Super @ 0.5%)		
	Ipomoea purpurea	Morning glory	1b	All plants	Pull down and slash	Scrape and paint stem using undiluted Glyphosate (Springbok 360 SL or similar).		

	Ipomoea alba	Moon flower	1b	All plants	Pull down and slash	Scrape and paint stem using undiluted Glyphosate (Springbok 360 SL or similar).		
	Lantana camara	Lantana	1b	Small plants (<1 m)	Hand pull and slash	Foliar spray 0.75 - 1% Picloram (Access 240 SL) in water with adjuvant (Actipron Super @ 0.5%)		
				Large plants (>1 m)	Slash and cut, pull up root.	Treat cut stump with 1.0% Picloram (Access 240 SL) in water with adjuvant (Actipron Super @ 0.5%)	Apply to low cut stumps (10 – 20 cm high) preferably with a single cut surface. Apply to complete cut surface of stumps with a diameter or less than 10 cm. Where multiple stumps are present, all cut surfaces must be treated. For bigger stumps apply to the cambial region (sapwood) of the cut surface. In all cases, apply until the point of run-off. A follow-up spray as a coppice application may be required. Use dye to mark cut stumps.	

	Melia azedarach	Syringa	1b	Small plants (<1 m)	Hand pull and slash	None		
				Large trees and saplings > 1 m	Fell or ring bark	Trees up to 25 cm stem diameter: Basal stem application with 2.0% Triclopyr (Garlon 480) in diesel. Larger trees: Treat cut stump with the same mixture (or in water with adjuvant - Actipron Super @0.5%)		
	Pennisetum purpureum	Napier Fodder	1b	All plants	Cut back and pull up roots	Cut back and treat regrowth with a Glyphosate (Springbok 360 SL or similar) herbicide - 1.5% solution with water.		
	Psidium guajava	Guava	2/3 in KZN	Small plants (<1 m)	Hand pull and slash	Foliar spary 1.5% fluroxypyr / picloram (Plenum 160 ME) in water with adjuvant (Actipron Super @ 0.5%)		
				Large trees and saplings > 1 m	Fell or ring bark	Treat cut stump with 12.5% Imazapyr (ECO-Imazapyr 100SL) in water	Use dye to mark treated stumps	

	Ricinus communis	Castor Oil	1b	Small plants (< 1m)	Hand pull and slash	None		
				Large plants (>1 m)	Cut back and pull up roots	Treat cut stump with 1.0% luroxypyr / picloram (Plenum 160 ME) in water with adjuvant (Actipron Super @ 0.5%)		
	Schinus terebinthefolius	Brazilian Pepper	1b in KZN	Small plants (<1 m)	Hand pull	None		
				Large plants (>1 m)	Fell or ring bark	Basal stem treatment using 2.0% Triclopyr (Garlon 480) in diesel.	Coppices readily. Dispose of cut material.	
	Solanum mauritianum	Bugweed	1b	Small plants (up to 1.5 m)	Hand pull	Foliar spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
				Large plants (>1.5 m)	Cut back and pull up roots	Basal stem treatment using 2.0% Triclopyr (Garlon 480) in diesel.		

Aquatic AIPs	***Azolla filiculoides***	Red Water Fern	1b	All plants	Remove by hand	Not necessary	The biological control agent *Stenopelmus rufinasus* is naturalised in KZN and is effective. If infestation occurs, plants must be checked for the presence of the weevil. Once its presence has been confirmed, no further action must be taken. The weevil will effectively control the infestation.	

5.4.3. REPORTING OF ENVIRONMENTAL INCIDENTS

Definitions

"Incident" as defined in NEMA	An unexpected, sudden and uncontrolled release of a hazardous substance, including from a major emission, fire or explosion, that causes, has caused or may cause significant harm to the environment, human life or property.
"Incident" as defined in NWA	Incident or accident in which a substance- (i) pollutes or has the potential to pollute a water resource: or (ii) has or is likely to have. a detrimental effect on a water resource.
"*responsible person*" as defined in NEMA & NWA	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.
"*relevant authority*" as defined in NEMA	(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.

Procedure should an *incident*, as defined above, occur on site:

The responsible person or, where the incident occurred in the course of that person's employment, his or her employer	Complete an Emergency Incident Report (template provided in Appendix 3). The report must be sent to the following personnel within 14 days of the incident occurring. (i) the Director-General of the Department of Environmental Affairs; (ii) the Director-General of the Department of Water & Sanitation; (iii) the South African Police Services and the relevant fire prevention service; (iv) the relevant provincial head of department or municipality; (v) The relevant catchment management agency, if applicable; and All persons whose health may be affected by the incident.
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-	(i) 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; (ii) Undertake clean-up procedures; (iii) Remedy the effects of the incident; (iv) Assess the immediate and long-term effects of the incident on the environment and public health;

Should the responsible person fail to comply, or inadequately comply with a directive received by a relevant authority, there be uncertainty as to who the responsible person is; or 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 contain and minimise the effects of the incident; undertake clean-up procedures; and remedy the effects of the incident. A relevant authority may claim reimbursement of all reasonable costs incurred by it in terms of subsection (8) from every responsible person jointly and severally.

6.0. RECEIPT OF ENVIRONMENTAL MANAGEMENT PROGRAMME & ACKNOWLEDGEMENT OF ENVIRONMENTAL RISKS

By signing this register, I confirm that I have received a copy of the Environmental Management Programme (EMPr) prepared by Confluence Strategic Development (Pty) Ltd and dated December 2021. I am aware of the environmental sensitivities of the site as shown in Figure 5 of the EMPr.

COMPANY	NAME	CONTACT DETAILS	AREA OF WORK	SIGN

APPENDIX 1

LAND ART STUDIO - LANDSCAPE PHILOSOPHY AND CONCEPT MASTER PLAN

APPENDIX 2

SDP: ECOLOGICAL AND ENVIRONMENTAL SERVICES – GENERAL REHABILITATION PROGRAMME

APPENDIX 3

EMERGENCY INCIDENT REPORT TEMPLATE