

Appendix A

July 2020 ECO checklist

PROJECT: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Reference: C1008.01

1. EMP CONTENT CHECKLIST

1.1. Phase: Construction

1.1.1. AWARENESS (INDUCTION) TRAINING

Requirement	EMP ref. pg.	Responsibility	Compliance	Comment
<p>The EO or ESO, or ECO are responsible in ensuring everyone on site is given an environmental awareness induction session which not only clearly defines what the environment is and specifics detailing the local environment but outlines the requirements of the EMP as a management tool to protect the environment.</p> <p>Refresher courses must be conducted as and when required. The EO or ESO must ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area/habitat in which they are working.</p> <p>Awareness posters and a hand out must be produced to create awareness throughout the site.</p>	19	EO/ECO	Compliant	<p>Induction given to new employees and proof kept on file. File should be updated when new employees appointed.</p> <p>Toolbox Talks in file and proof kept up to date. File should be regularly updated to include toolbox talks covering environmental and safety topics. Proof of toolbox talk should include date, topics covered and signature of manager and/or staff. All updates completed by 14 August 2020.</p>
Compliant	1			
Partial Compliance	0			
Not Compliant	0			

1.1.2. SITE DOCUMENTATION

Requirement	EMP ref. pg.	Responsibility	Compliance	Comment
The following is list of documentation that	19-20	EO/Contractor	-	-

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

must be held on site and must be made available to the ECO and/or the Department of Environmental Affairs and Development Planning (DEADP) on request:				
<ul style="list-style-type: none"> Access negotiations and physical access plan 			Compliant	Received electronic plans and hard copies available on site. Layout plans of approved stockpile areas on file. Land owner agreement/consent on file and map of agreed stockpiles' layout. Necessary files to be kept on file and records of new demarcation to be kept.
<ul style="list-style-type: none"> Site daily diary /instruction book 			Compliant	Available on site. File to be updated with instruction as per the monthly ECO audit reports. All updates completed by 14 August 2020.
<ul style="list-style-type: none"> Records of all remediation / rehabilitation activities 			Compliant	Remediation records kept and sent to ECO as completed. Remediation/rehabilitation records need to be recorded and kept on file. All updates completed by 14 August 2020.
<ul style="list-style-type: none"> Copies of EO reports (management and monitoring) 			Compliant	Available on site. File to be updated regularly. All updates completed by 14 August 2020.
<ul style="list-style-type: none"> Complaints register 			Compliant	Available on site. Nothing recorded up to date. To be updated as needed. All updates completed by 14 August 2020.
<ul style="list-style-type: none"> Environmental Management Programme (EMP) <ul style="list-style-type: none"> Note: Environmental Management Programme (EMP). As per pg. 14, the implementation of the EMP is not an additional or "add on" requirement. The EMP is legally binding through NEMA and the relevant EA 			-	-
The following attached pro forma documentation is to be filled out and is binding to the EMP and project contract and includes, but not limited to, the following:	20	Developer & Contractor	-	-
<ul style="list-style-type: none"> Declaration of understanding by the Developer 		Developer	Not compliant	Not signed yet.
<ul style="list-style-type: none"> Declaration of understanding by the 		Contractor	Compliant	Signed and available on site.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Contractor				
The following attached pro forma documentation is to be filled out and maintained. These are binding to the EMP and project contract. They include, but are not limited to, the following:	20	EO/Contractor	-	-
<ul style="list-style-type: none"> Environmental incidents 			Complaint	Register kept and needs to be updated as needed and sent to ECO for checking. Incident recorded by ECO during, monthly visits recorded in ECO reports and those by the EO in the checklists. All updates completed by 14 August 2020 if needed.
<ul style="list-style-type: none"> Records of all remediation / rehabilitation activities 			Compliant	Remediation records kept and sent to ECO as completed. Remediation/rehabilitation records need to be recorded and kept on file e.g. cleaning of spills, proper disposal of hazardous waste. All updates completed by 14 August 2020.
Compliant			8	
Partial Compliance			0	
Not Compliant			1	

TABLE 1: PROPOSED ROAD UPGRDE OF DR1699 AND DR1688, CALITZDORP-OUTDSHOORN, WESTERN CAPE, PRE- CONSTRUCTION (PLANNING) PHASE EMP

Phase of development	PRE-CONSTRUCTION (PLANNING) pg. 25 of EMP					
Impact / issue	GENERAL					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Visual Impact <ul style="list-style-type: none"> Light output is to be confined within property boundaries through using specifically designed luminaries such as full cut-off luminaries to minimize upward spread of light near to and above the horizontal Figure 1 – A; Spotlight luminaries to be tilted in order to direct the light to the intended spot, instead of allowing it to light areas outside 	<ul style="list-style-type: none"> Unnecessary visually visible impacts are avoided. Ensure exact implementation of EMP guidelines with regards to light and lighting. 	<ul style="list-style-type: none"> Contract records Signed declaration pro formas 	Project team	Design and implementation	NA	Not applicable to the site at this stage.

<p>its purpose (Figure – B Report);</p> <ul style="list-style-type: none"> • Outdoor spot lights to be mounted on the appropriate pole height. Higher mounting heights allow lower main beam angles which can reduce glare (Figure 1– C). • Utilize control systems to reduce light levels during inactive periods or at predetermined times while maintaining sufficient lighting for safety and security (NEMA, 2000). • Where vertical surfaces are illuminated, such as advertising signs or buildings façades, luminaries must light downwards. (Figure 1– E) 						
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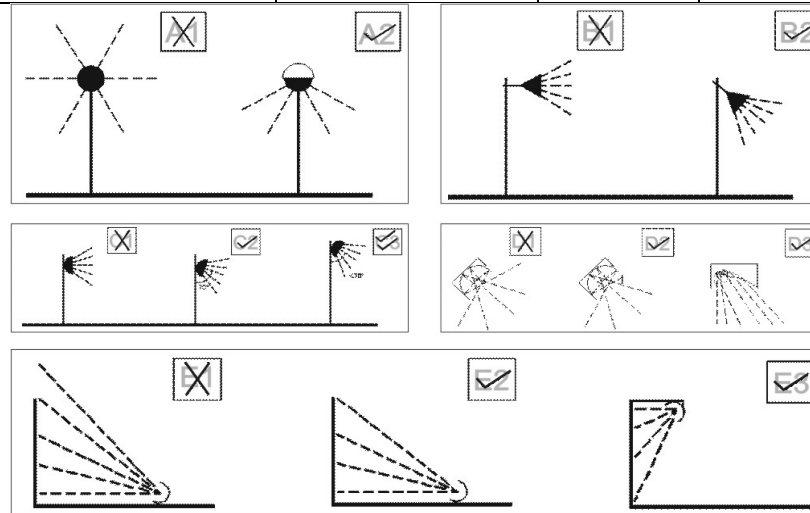


Figure 1: Guidelines for the reduction of obtrusive lighting (Source: ILE, 2005)

Phase of development	PRE-CONSTRUCTION (PLANNING) pg. 27 of EMP					
Impact / issue	GENERAL					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>Project contract and programme</p> <ul style="list-style-type: none"> The EMP must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract. 	<ul style="list-style-type: none"> Contingencies for minimizing negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> Contract records Signed declaration pro forma's 	Project team	-	NA	Not part of ECO audit.
<ul style="list-style-type: none"> A copy of this EMP must be available on site. 					Compliant	EMP on file on site.
<ul style="list-style-type: none"> The Contractor shall ensure that all the personnel on site, sub-contractors, suppliers, etc. are familiar with and understand the specifications contained in the EMP. 	<ul style="list-style-type: none"> Ensure environmental awareness and formalize environmental responsibilities and implementation 				Compliant	New personnel, subcontractors and visitors have received induction and proof available on file. File should be updated when new personnel and subcontractors on site.
<p>Appointments and duties of project team</p> <ul style="list-style-type: none"> The contact details for the ECO, RE, EO, Contractor and ESO shall be completed on the attached pro forma and a copy kept on site. This document must be made available to the Department of Environmental Affairs and Development Planning (DEADP) on request. 	<ul style="list-style-type: none"> Contingencies for minimising negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> Contract records Signed declaration pro forma's 	Project team	-	Compliant	Necessary contact details kept on site.
<ul style="list-style-type: none"> Subcontractor(s) contracts with the principle contractor must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to 					NA	Agreement between any sub-contractors and principal contractors should kept on file and specifically include clause 'to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

the management activities stipulated in this EMP.						of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP.'
<ul style="list-style-type: none"> Before construction activities commence, role players must have a clear indication to their role in the implementation of this EMP. 					Compliant	Discussed during first site meeting.
Compliant					4	
Partial Compliance					0	
Not Compliant					0	

Phase of development	PRE-CONSTRUCTION (PLANNING) pg. 28 of EMP document						
Impact / issue	GENERAL						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT	
Site demarcation and development <ul style="list-style-type: none"> The surveys for the overall project area and construction footprint as approved in the Environmental Authorisation (EA) must be complete and clearly demarcated before the contractors set up their crew camps or begin construction. 	<ul style="list-style-type: none"> Contingencies for minimising negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> Demarcated area's Filled in section of this document 	EAP specialist, Engineer, contractor	As and when required	Compliant	<ul style="list-style-type: none"> Demarcation for stockpiles and construction footprint complete. In some places demarcation had to be removed to make way for re-fencing that is in progress. Areas previously disturbed outside footprint rehabilitated. Proof to be kept on file of all rehabilitation/remediation measures. 	
All relevant 'general' and 'specific' conditions contained in the Environmental Authorisation (EA) must be included in the space provided below and					-	-	

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>included as part of this EMP when the “<i>declaration of understanding</i>” is signed by The Department of Transport and Public Services, the Engineer and the Contractor.</p>						
<p>Where construction in watercourses are required (with specific reference to work to be done on culverts), no construction activities are allowed outside of the demarcated road reserves.</p>					<p>Compliant</p>	<p>Rehabilitation started at disturbance beyond road reserve at culvert km1.66. Any areas beyond demarcation considered no-go areas, i.e. proof of toolbox talk that areas beyond demarcation considered no-go on file. Most areas where boundaries were overstepped in the past, areas have been rehabilitated. Droppers are being replaced by reinstating fencing.</p>
<p>All the watercourses (excluding the irrigation system) are seasonal. Construction is therefore preferred in the drier months, however taking the drought into account, this can be extended to whenever the riverbed is dry.</p>					<p>Compliant</p>	<p>This is being complied with as far as practically possible, taking into account the national COVID-19 lockdown has caused and extension of completion date of construction.</p>
<p>Minimisation of the disturbance footprint within the road reserve: All efforts should be made to protect any remaining natural vegetation between the road shoulder and the boundary fence. All areas with significant remaining natural veld should be marked on the construction</p>					<p>Compliant</p>	<p>New measure in the EMP that was approved 28 May 2020 and will be implemented during the second phase of construction. Only the first road section contains some natural vegetation in the road reserve and this has been preserved as much as practically possible. Where shaping of road reserve is needed (to facilitate proper functioning of road by managing and diverting run-off water), as</p>

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>maps, which must be used between the Engineers and the ECO to decide on the best construction method for that specific area. Where disturbance is unavoidable (e.g. construction of by-pass roads) the by-pass road should be placed along one side of the road, whilst protecting the road reserve on the other side of the road (which should be demarcated as No-Go areas). Ideally the side that is protected should contain the better general vegetation compliment.</p>						<p>little existing vegetation should be removed as practically possible.</p>
<ul style="list-style-type: none"> • Point 11.2 of Environmental Authorisation: All <u>existing degraded road verges</u> will be disturbed along DR1699 and DR1688 as per approved Basic Assessment Report due to the fact that the road will be widened. The widening of the road will only expand on the existing degraded road reserves. The surrounding natural areas will be clearly demarcated and seen as no go areas. 					<p>Compliant</p>	<p>Construction confined to degraded road verges. Natural areas disturbed behind fence line at some of the culverts and bridges have been marked as no-go area and have been rehabilitated. Rehabilitation of site started in some road sections. Compacted topsoil to be ripped. Where shaping of road reserve is needed (to facilitate proper functioning of road by managing and diverting run-off water), as little existing vegetation should be removed as practically possible.</p>
<ul style="list-style-type: none"> • The EO and ECO must be on site in order to make sure the correct areas are fully demarcated. 					<p>Compliant</p>	<p>ECO inspects demarcations as part of monthly audits. EO to be present for demarcation of entire site. EO to ensure demarcation is adhered to when going</p>

						through inspections.
Compliant					6	
Partial Compliance					0	
Not Compliant					0	

Phase of development	PRE-CONSTRUCTION (PLANNING) pg. 29 of EMP					
Impact / issue	GENERAL					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
<p>Emergencies, non-compliance and communication</p> <p>The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following, before construction may begin:</p> <ul style="list-style-type: none"> • Emergency spills procedures for the contamination of soils from spills and fire • Handling & storage of oils and chemicals • Cement and concrete batching, which includes the storage, washing & disposal of cement, packaging, tools and plant. • Diesel tanks and refueling procedures • Crew camps and construction lay down areas • Workshop maintenance and cleaning of plant • Communication in emergencies 	<ul style="list-style-type: none"> • Contingencies for minimising negative impacts anticipated to occur during the construction phase 	<ul style="list-style-type: none"> • Method statements 	Contractor, Engineer	As and when required	-	-
					Compliant	Received electronic copy of methods statements & statements kept on site on file.
					Compliant	Received electronic copy of methods statements & statements kept on site on file.
					Compliant	Received electronic copy of methods statements & statements kept on site on file.
					Compliant	Received electronic copy of methods statements & statements kept on site on file.
					Compliant	Received electronic copy of methods statements & statements kept on site on file.
					Compliant	Received electronic copy of methods statements & statements kept on site on file.
					Compliant	Communication procedures

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

must follow the suggested lines of communication as stipulated in Figure 1 of the EMP.						kept on file (part of EMP) and put up at site office.
Compliant					7	
Partial Compliance					0	
Not Compliant					0	

Phase of development	PRE-CONSTRUCTION (PLANNING) pg. 30 of EMP					
Impact / issue	GENERAL					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
River Maintenance Guidelines	<ul style="list-style-type: none"> Contingencies for minimising negative impacts anticipated to occur during the construction phase. Ensure environmental awareness and formalise environmental responsibilities and implementation. 	<ul style="list-style-type: none"> Contract records. Signed declaration pro forma's. 	Project team.		-	-
<ul style="list-style-type: none"> Proper authorisation should be obtained from the relevant environmental authority (DEADP) in this case). 					Compliant	Proper authorization received, i.e. EA and GA. Both available on site.
<ul style="list-style-type: none"> Authorisation should not be valid for more than two years and annual reassessment of the activity should be done by an independent environmental consultant. 					Compliant	Proper authorization received, i.e. EA and GA. Both available on site.
<ul style="list-style-type: none"> Proper information to and training of machine operators and site personnel. 					Compliant	Regular toolbox talks to be given to site personnel. Evidence of most recent talks kept on file. Toolbox talk topics plus proof to be kept on file.
<ul style="list-style-type: none"> The watercourses must be clearly cordoned off as a no go area. 					Compliant	Rehabilitation started at disturbance beyond road reserve at culvert km1.66. Any areas beyond demarcation considered no-go areas, i.e. proof of toolbox talk that areas beyond demarcation considered no-go on file. Most areas where boundaries were overstepped in the past, areas have been rehabilitated. Droppers are being replaced by

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

						reinstating fencing.
<ul style="list-style-type: none"> No constructing activities will be allowed within the watercourses 					Compliant	Rehabilitation started at disturbance beyond road reserve at culvert km1.66. Any areas beyond demarcation considered no-go areas, i.e. proof of toolbox talk that areas beyond demarcation considered no-go on file. Most areas where boundaries were overstepped in the past, areas have been rehabilitated. Droppers are being replaced by reinstating fencing.
<ul style="list-style-type: none"> Constructing/rehabilitation activities of the degraded culverts/pipelines at the watercourses should be kept to a minimum 					Compliant	Natural areas disturbed behind fence line at some of the culverts and bridges rehabilitated.
<ul style="list-style-type: none"> The upgrade culverts need to be rehabilitated by means of hydro seeding these areas with endemic seeds as per the specifications of the Botanist. Please refer to the rehabilitation specifications attached. 					NA	Not applicable at this stage. Culverts to be rehabilitated by means of hydro-seeding as in recommended plan.
<ul style="list-style-type: none"> The watercourses should be rehabilitated, under the supervision of an appropriately-briefed Environmental Control Officer and Horticulturist using the guidelines of the Botanist. 					NA	Not applicable at this stage. Watercourses to be rehabilitated by means of hydro-seeding as in recommended plan.
<ul style="list-style-type: none"> Construction activities at the culverts/pipelines needs to be conducted during the dry 					NA	Part of design and planning, not checked as part of ECO audit.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

season						
<ul style="list-style-type: none"> Any crossings such as bridges, pipelines or culverts should explore suitably means to allow for wild animals to move freely and safely under the road. 					Compliant	Animals able to move freely under roads at bridges.
<ul style="list-style-type: none"> Every possible consideration should be given to the provision of silt-trapping devices or ponds on the upstream side of the road. 					NA	Part of design, not checked as part of ECO audit.
<ul style="list-style-type: none"> The contractor needs to provide method statements of the upgrade of the culvert/pipelines at the watercourses, before any construction activities will be allowed. 					Compliant	Method statement received for currently active structures. Statements submitted as needed.
According to the freshwater assessment conducted; The proposed upgrades to the existing road, needs to be undertaken in accordance with standard road building techniques and drainage management as per, for example SANRAL guidelines, and duly supervised by an Environmental Control Officer.					Compliant	EO and ECO appointed to oversee works.
<ul style="list-style-type: none"> Contractor needs to ensure that no spills, sediment laden or otherwise, occur into the irrigation system. 					Compliant	No non-compliances observed.
<ul style="list-style-type: none"> All works on the approaches to and across the bridged 					Compliant	Method statement received for currently active structures. Statement

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

rivers must be subject to Method Statements providing protection to the riverine environments.					for other structures to be submitted as needed.
Compliant					11
Partial Compliance					0
Not Compliant					0

Phase of development	PRE-CONSTRUCTION (PLANNING) pg. 32 of EMP					
Impact / issue	GENERAL					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Fauna and Flora Point 11.5 of Environmental Authorisation: A Botanist has been appointed and the necessary botanical assessment and scan has been conducted: <ul style="list-style-type: none"> No Red-List or species of conservation concern (SCC) or endemic species were encountered during the survey. It is thought to be highly unlikely that species of conservation concern would be impacted by the proposed road upgrade. 	To protect possible faunal species on the site from being exterminated.	Should sensitive species be present on the site, the correct re-establishment of these species	Contractor and Developer	Before construction commences	-	-
<ul style="list-style-type: none"> It must be emphasized that despite threatened status of the ecosystems through which the roads are aligned, the overall impression is that the vegetation within the road reserves is in poor, transformed condition and has low botanical sensitivity. It does not make any meaningful contribution to the conservation of the various vegetation or ecosystem types 					-	-
<ul style="list-style-type: none"> The present generally poor 					-	-

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>condition of the vegetation in the road reserve of the DR1699 and DR1688 means that there is nothing of concern from a botanical perspective and that proposed road-building activities would have low negative impacts.</p>						
<ul style="list-style-type: none"> The road reserve is however, despite its poor condition, an important zone of natural or semi-natural habitat that should be managed to encourage a diversity of plant species. Road building activities must therefore be approached with caution to ensure that there is no further degradation of the habitat. 					Compliant	Disturbance along road is mostly kept to practical minimum size and contained within the degraded road reserve. Any disturbance outside demarcated footprint to be marked as no-go areas, rehabilitated and records kept on file.
<ul style="list-style-type: none"> Should any species of conservation concern be found the ECO needs to be informed. The ECO will ensure that this species be taken to GNEC rehabilitation nursery until the end of the construction period and then planted back. 					Compliant	No plants of conservation value found up to date.
<ul style="list-style-type: none"> Point 11.11 of Environmental Authorisation: Should any plants of geophytes of significant value be found along the road verges/shoulders it needs to be temporarily re-located to the GNEC rehabilitation nursery. Consult the appropriate qualified ECO in this regards. The plants will be temporarily stored within the rehabilitation nursery until the end of the construction period 					Compliant	No plants of significant value found up to date.

where these plants will be planted back in the natural areas.							
<ul style="list-style-type: none"> Fauna species found during the construction activities along the road verges to be disturbed needs to be relocated to a suitable receptor site. Consult the ECO. 						Compliant	No recorded instances up to date.
<ul style="list-style-type: none"> Any crossings such as bridges, pipelines or culverts should explore suitable means to allow for wild animals to move freely and safely under the road. 						Compliant	Animals can move freely under road at bridges.
Compliant						5	
Partial Compliance						0	
Not Compliant						0	

Table 3: PROPOSED ROAD UPGRADE OF DR1699 AND DR1688, CALITZDORP-OUTDSHOORN, WESTERN CAPE, CONSTRUCTION PHASE EMP (Materials)

Phase of development	CONSTRUCTION pg. 36 of EMP					
Impact / issue	Materials					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Handling						
Stockpiles	<ul style="list-style-type: none"> Minimise scarring of the soil surface and land features Minimise disturbance and loss of soil Minimise construction footprint Maintain the integrity of topsoil's for landscaping and rehabilitation 	<ul style="list-style-type: none"> No visible erosion scars once construction is completed The footprint has not exceeded the agreed site in terms of EA etc. Minimal invasive weed and grass growth 	Contractor	Daily	-	-
All ripped topsoil during the road upgrade activities needs to be stockpiled (wind rowed) for rehabilitation purposes.					Compliant	Topsoil stored in stockpile area or scraped to side of road and protected from erosion.
All stockpiled material must be easily accessible on site without any environmental					Compliant	Stockpile material easily accessible at this stage.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

damage of the surrounding properties.	<ul style="list-style-type: none"> • Containment of invasive plant growth by means of topsoil monitoring. • Minimise contamination of storm water run-off 	<ul style="list-style-type: none"> • No signs of sedimentation and erosion 				
All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised.			Compliant	Stockpiled material not at risk for spread.		
Storage and stockpiling of construction material must also observe a suitable buffer from the water courses.			Compliant	No stockpiled material in watercourses.		
In the case of strong wind and/or rain all stockpile material must be covered with a tarpaulin in order to prevent erosion.			NA	EO to ensure compliance in times of strong wind and/or rain.		
The stockpiles may only be placed within the demarcated areas the location of which must be approved by the RE, EO or ECO.			Compliant	<ul style="list-style-type: none"> • Rehabilitation in progress of stockpiles (latest stockpile & stockpile 2 rehabilitation complete). • Proof to be kept on file of all rehabilitation/remediation measures. 		
Stockpiles are to be stabilised if signs of erosion are visible.			Compliant	Removed plant material has been spread on topsoil as stabilizers to protect soil against erosion.		
Soils from different horizons must be			Compliant	Topsoil stored separately from other material.		

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

stockpiled such that topsoil stockpiles do not get contaminated by sub-soil material.						
Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the EO, RE and ECO.					Compliant	ECO inspects this during monthly audits. EO to monitor weekly.
No plant, workforce or any construction related activities may be allowed onto the topsoil stockpiles.					Compliant	No such activities observed up to date.
Topsoil stockpiles must be clearly demarcated as no-go areas.					Compliant	Signage present on topsoil stockpiles.
Stockpiles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition.					Compliant	Topsoil stockpiles height comply.
Stockpiling of road-building material must be confined to					Compliant	Stockpile material limited to approved and demarcated areas.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

strictly demarcated areas such as at existing lay-bys to limit the distribution of this material in the road reserve.						
Topsoil must be removed from areas to be distributed and protected for use during the rehabilitation of the road verges.					Compliant	This is being implemented throughout the project duration so far.
Compliant					13	
Partial Compliance					0	
Not Compliant					0	

Phase of development	CONSTRUCTION pg. 37 of EMP					
Impact / issue	Materials					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Oil and chemicals <ul style="list-style-type: none"> The contractor must provide method statements for the “handling & storage of oils and chemicals”, “fire”, and “emergency spills procedures These substances must be confined to specific and secured areas within the contractor’s camp away from the non perennial watercourses, and in a way that does not pose a danger of 	<ul style="list-style-type: none"> Prevention of pollution of the environment Minimise chances of transgression of the acts controlling pollution 	<ul style="list-style-type: none"> No pollution of the environment and especially theriver No litigation due to transgression of pollution controlacts No complaints from I & AP’s Method statements 	Contractor	Daily	Compliant	Contractor provided method statement, method statements to be kept on file.
					Compliant	Substances stored in bunded area and cement pallets covered with plastic.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>pollution even during times of high rainfall. These areas must be imperviously bunded with adequate containment (at least 1.1 times the volume of the fuel) for potential spills or leaks.</p>					
<ul style="list-style-type: none"> • Drip trays (minimum of 10cm deep) must be placed under all machinery and vehicles. 				Compliant	Drip trays for generators, vehicles and machinery used on site.
<ul style="list-style-type: none"> • The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. 				Compliant	Appropriate sized drip trays used.
<p>The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle.</p>				NA	Volume and depth of drip trays to be assessed per machine/vehicle by contractor/EO.
<ul style="list-style-type: none"> • Any spills larger than 100ℓ should be reported to all local authorities. 				NA	None recorded up to date.
<ul style="list-style-type: none"> • Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practice (sunsorb is a recommended product that is environmentally friendly). 				Compliant	Spill kit available on site, kept at Crusher site during the day.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<ul style="list-style-type: none"> All spilled hazardous substances must be contained in impermeable containers for removal to a General & Hazardous Waste Landfill site, (this includes contaminated soils, and drenched spill kit material). 					Compliant	<ul style="list-style-type: none"> Slips of safe disposal and register kept. Slips of safe disposal from facilities kept on file once available but register updated immediately.
Compliant					6	
Partial Compliance					0	
Not Compliant					0	

Phase of development	CONSTRUCTION pg. 38 of EMP					
Impact / issue	Materials					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Cement	<ul style="list-style-type: none"> Minimise the possibility of cement residue entering into the surrounding environment Minimise pollution of soil, surface and ground water resources 	<ul style="list-style-type: none"> No evidence of contaminated soil on the construction site No evidence of contaminated water resources Method statement 	Contractor	Monitored daily	-	-
It is suggested that ready-mix cement be used as far as possible to minimize the possible impact on the surrounding environment					Compliant	Ready mix concrete used when possible. Method statement provided by contractor.
Cement batching areas must be located in consultation with the RE, EO or ECO to ensure residues are contained and that the proposed location does not fall within sensitive areas such as drainage lines, storm water channels, etc.					Compliant	Batching area currently in road reserve and not in sensitive areas.
The contractors must provide and maintain a method statement for “cement and concrete batching” which includes the storage, washing & disposal of cement, packaging, tools and plant.					Compliant	Method statement updated and provided.
The mixing of concrete shall					Compliant	Mixing of concrete on mortar

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>only be done at selected sites on mortar boards or similar structures to contain run-off into natural vegetation, soils, and streams leading to the river. Cleaning of cement mixing and handling equipment shall be done using proper cleaning trays.</p>					boards.
<p>All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a Licensed Landfill site. All empty cement bags are to be picked up immediately to ensure that cement dust is not blown away. Cement dust is poisonous and will be detrimental to the environment and especially to the non perennial watercourses. Any spillage that may occur must be investigated and immediate remedial action shall be taken.</p>				Compliant	<ul style="list-style-type: none"> • Empty containers disposed of in designated bins – no empty containers left on site. • Record of waste removal kept for all waste removed from site. • Proof of safe disposal of general waste kept on file (slips). • Proof of safe disposal for any hazardous waste provided and kept on file (slips).
<p>The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste to a Licensed Landfill site. Washing of the remains into the ground is unacceptable.</p>				Compliant	Batching area currently in road reserve and not in sensitive areas. Cement washing water to be disposed of as per method statement.
Compliant				6	
Partial Compliance				0	
Not Compliant				0	

Phase of development	CONSTRUCTION pg. 39 of EMP					
Impact / issue	Materials					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
DANGEROUS AND TOXIC MATERIALS	<ul style="list-style-type: none"> Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments Minimise chances of transgression of the acts controlling pollution 	<ul style="list-style-type: none"> No visible signs of pollution No litigation due to transgression of pollution control acts 	Contractor	Monitor daily	-	-
Provision of storage facilities Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas. Storage facilities should be bunded, roofed, secure, rain, wind and tamper proof.					Compliant	Stored in bunded and impermeable area.
Storage areas shall display the required safety signs depicting “no smoking”, No Naked lights” and “Danger” containers shall be clearly marked to indicate contents as well as safety requirements.					Compliant	Storage has warning sign of hazardous and/or flammable material.
Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction.					Compliant	Proof sent that personnel received proper training.
Paint, herbicide and insecticides will not be allowed on or near the					Compliant	Substances not on site nor near watercourses. Open chemical container left in stormwater drain

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

site.							but immediately removed and placed on bakkie by contractor.
In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs (DWA) must be informed immediately.						Compliant	No incidents recorded up to date.
Empty containers shall be removed to a General & Hazardous Waste Landfill site.						Compliant	Records of waste removal kept and slips provided and kept on file once available.
Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required.						Compliant	MSDS available on file for hazardous materials kept on site and file updated.
Compliant						7	
Partial Compliance						0	
Not Compliant						0	

Phase of development	CONSTRUCTION pg. 40 of EMP						
Impact / issue	Materials						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT	
Bulk storage of fuels and oils The contractors must provide and maintain a method statement for "Diesel tanks and refueling procedures".	<ul style="list-style-type: none"> Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments Minimise chances of transgression of the acts 	<ul style="list-style-type: none"> No visible signs of pollution No litigation due to transgression of pollution control acts Method statement 	Contractor	Once off, as required	Compliant	Method statement provided for "Diesel tanks and refueling procedures"	
Bulk fuel storage tanks on the site shall be on an impervious surface					NA	Bulk storage not yet applicable, but should	

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

that is bunded and able to contain at least 110% of the volume of the tanks.	controlling pollution						be included in method statement as above.
A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres.						NA	Should be taken note of when volumes applicable.
As no application was lodged for this activity, it should be noted that Environmental Authorisation is required for the storage of Diesel and/or Petrol with volumes greater than 30 000 litres.						NA	Should be taken note of when volumes applicable.
Bulk fuel storage tanks shall be located in a portion of the construction camp where they do not pose a high risk in terms of water pollution (i.e. they must be located far away from the watercourse found on site.						NA	Bulk storage not yet applicable, but should be included in method statement as above.
Bulk fuel storage tanks shall be placed so that they are out of the way of traffic, so that the risk of the tanks being ruptured or damaged by vehicles is minimised.						NA	Bulk storage not yet applicable, but should be included in method statement as above.
Bulk fuel storage should be covered during the rainy season.						NA	Bulk storage not yet applicable, but should be included in method statement as above.
Compliant						1	
Partial Compliance						0	
Not Compliant						0	

Phase of development	CONSTRUCTION pg. 41 of EMP					
Impact / issue	Materials					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Use of dangerous and toxic materials	• Prevention of	• No pollution	Contractor	As required	-	-

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

The contractor shall keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur.	pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution	of the environment • No litigation due to transgression of pollution control acts				Compliant	Spill kit and firefighting equipment available on site.
The contractor shall set up a procedure for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. These procedures must be developed in consultation and approval by the appointed EO.						Compliant	Method statement for spills and fire provided.
All staff should receive some form of fire training. Fire buckets and hoses shall be in good working order and easily accessible on site.						Compliant	Contractor provided proof of fire training.
A record must be kept of all spills and the corrective action taken.						Compliant	Register available on site but all incident recorded in ECO report and EO checklists.
Compliant						4	
Partial Compliance						0	
Not Compliant						0	

Phase of development	CONSTRUCTION pg. 42 of EMP						
Impact / issue	Materials						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT	
River Maintenance Procedure	<ul style="list-style-type: none"> Contingencies for minimising negative impacts anticipated to occur during the construction phase. Ensure 	<ul style="list-style-type: none"> Contract records. Signed declaration pro forma's. 	Contractor, EO.		-	-	
Construction activities at the culvert/pipelines to be upgraded should be kept to a minimum.					Compliant	Construction activities at watercourses kept to a minimum.	
Construction activities at the culverts/pipelines needs to be conducted during the dry season. However taking the current drought					NA	Part of design and planning, not checked as part of ECO audit, but so far river beds have been dry during construction.	

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>into account, this can be extended to periods where the riverbed is dry.</p>	<p>environmental awareness and formalise environmental responsibilities and implementation</p>					
<ul style="list-style-type: none"> The upgraded culverts need to be rehabilitated by means seeding these areas with endemic seeds as per the specifications of the Botanist. Where this is not possible, the conserved topsoil must be used to rehabilitated disturbed areas. 		NA	<p>Not applicable at this stage. Watercourses to be rehabilitated by means of returning topsoil as in recommended plan.</p>			
<ul style="list-style-type: none"> The disturbed areas at the culverts and pipelines should be rehabilitated, under the supervision of an appropriately-briefed Environmental Control Officer and Horticulturist. 		NA	<p>Not applicable at this stage. Watercourses to be rehabilitated by means of returning topsoil as in recommended plan.</p>			
<ul style="list-style-type: none"> Any crossings such as bridges, pipelines or culverts should explore suitably means to allow for wild animals to move freely and safely under the road. 		Compliant	<p>Animals can move freely under road at bridges.</p>			
<ul style="list-style-type: none"> Every possible consideration should be given to the provision of silt-trapping devices or ponds on the upstream side of the road. 		NA	<p>Part of design, not checked as part of ECO audit.</p>			
<ul style="list-style-type: none"> The contractor needs to provide method statements of the upgrade of the culverts/pipelines at the, before any construction activities will be allowed. The ECO needs to approve these method statements before activities may commence. 		Compliant	<p>Method statement received for structures. Statements for structures submitted as needed.</p>			
<ul style="list-style-type: none"> Wherever possible existing 	Compliant	<p>Access roads in degraded road</p>				

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>access routes to the watercourse should be used or</p> <ul style="list-style-type: none"> ○ Use the most degraded areas for access routes, ○ Keep erosion potential and aesthetics in mind, ○ Access routes must be rehabilitated. 						<p>reserve and existing access road used as far as possible. Access roads created by farmer at km km1.66 and not by contractor. Rehabilitation of access to watercourses in progress. Access roads to be rehabilitated post construction along with watercourses.</p>
<ul style="list-style-type: none"> • All potential pollutants should be kept away from the watercourse including: <ul style="list-style-type: none"> ○ Oil, diesel or petrol from construction vehicles, ○ Cement run-off and wet tar (uncured), ○ Any chemicals for the control of alien vegetation, ○ Sanitation structures and refuse disposal sites and ○ Soaps and any other chemicals and ○ Fertilisers. 					Compliant	<p>Open chemical container left in stormwater drain but immediately removed and placed on bakkie by contractor.</p>
<p>No spoil material should be placed in close proximity to the watercourses, dumped on riparian or bank habitats, spread out around trees, used to fill hollows and other irregularities in the floodplain, or be used for erosion control, but must be removed to approved dumping sites.</p>					Compliant	<p>No non-compliance observed.</p>

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<ul style="list-style-type: none"> According to the freshwater assessment conducted; The proposed upgrades to the existing road, needs to be undertaken in accordance with standard road building techniques and drainage management as per, for example SANRAL guidelines, and duly supervised by an Environmental Control Officer 					Compliant	EO and ECO appointed to oversee works.	
<ul style="list-style-type: none"> Contractor needs to ensure that no spills, sediment laden or otherwise, occur into the irrigation system. 					Compliant	No non-compliance observed.	
<ul style="list-style-type: none"> All works on the approaches to and across the bridged rivers must be subject to Method Statements providing protection to the riverine environments. 					Compliant	Method statement received for structures. Statements for structures submitted as needed.	
Compliant					9		
Partial Compliance					0		
Not Compliant					0		

Table 4: PROPOSED ROAD UPGRADE OF DR1699 AND DR1688, CALITZDORP-OUTDSHOORN, WESTERN CAPE CONSTRUCTION PHASE EMP (Plant)

Phase of development	CONSTRUCTION pg. 43 of EMP document					
Impact / issue	PLANT					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Eating areas and camp followers The contractors must provide and maintain a method statement for "Crew camps and construction lay down areas".	<ul style="list-style-type: none"> Control potential influx of vermin and flies Neat work place and hygienic 	<ul style="list-style-type: none"> No visual sign of vermin and flies No 	Contractor, EO	Once off, monitor daily	Compliant	Method statement provided.
The Contractor shall, in					Compliant	Secure bins or bags provided at

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>conjunction with the EO, designate the restricted eating area for eating during normal working hours. Two refuse bins with lids must be provided and cleaned on a daily basis. The bins are to be secure, wind, weather and scavenger proof.</p>	<p>environment</p> <ul style="list-style-type: none"> Minimise negative social impacts to local businesses and residences. 	<p>complaints from I & AP's</p>				work sites and cleaned.
<p>Designated areas for smoking must be provided.</p>			Compliant	<ul style="list-style-type: none"> Designated smoking area at site office and crusher site. Proof sent that workers informed that no smoking allowed in 'veld' or areas outside construction footprint. 		
<p>No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the EO and ECO.</p>			Compliant	No non-compliance observed.		
<p>No animals, domestic or otherwise are allowed on the premises. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.</p>			Compliant	No incidences recorded up to date.		
<p>Camp followers/informal traders must not be allowed to congregate on pavements or outside the construction site. However, at the contractors discretion facilities can be made available within the designated eating area.</p>			Compliant	No incidences recorded up to date.		
<p>Litter (even if originating outside the camp) and</p>			Compliant	Site generally clean and tidy. Litter in road reserve from road		

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

concrete bags etc. must be picked up and put into suitably closed bins.						users and not necessarily the contractor is still being cleaned up and a team was busy collect waste at section km0 – km1 at the time of the inspection.
Compliant						7
Partial Compliance						0
Not Compliant						0

Phase of development	CONSTRUCTION pg. 46					
Impact / issue	PLANT					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
<p>Toilets and ablution facilities The contractor will be responsible for providing all sanitary arrangements for his and the sub- contractors team. A minimum of one chemical toilet shall be provided per 15 persons.</p> <p>Sanitary arrangements shall be to the satisfaction of the ECO and the local authority. The contractor shall keep the toilets in a clean, neat and hygienic condition. The contractor shall supply toilet paper at all toilets at all times. Toilet paper dispensers shall be provided in all toilets.</p> <p>Toilets provided by the contractor must be easily accessible and a maximum of 150m from the works area to ensure they are utilised. All</p>	<ul style="list-style-type: none"> Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat Minimise potential of diseases on site Minimise potential to pollute soils, water resources and natural habitats 	<ul style="list-style-type: none"> Workforce use toilets provided No complaints received from I & AP's as well as members of the workforce No visible or measurable signs of pollution of the environment (soils, ground and surface water) 	Contractor, RE or EO	As and when required	Compliant	Sanitary arrangements checked as part of SHE inspections and compliance to be ensured by contractor.
					Compliant	Sanitary arrangements checked as part of SHE inspections and compliance to be ensured by contractor.
					Compliant	No non-compliances observed.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the RE, EO or ECO.						
The contractor (who must use reputable toilet- servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) shall ensure that all toilets are cleaned and emptied before the builders' or other public holidays.					Compliant	Toilets serviced by service provider. Records of servicing, maintenance and cleaning kept on file and to be updated regularly.
Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times.					Compliant	Ablution facilities secured.
The natural surrounding area may NOT be used for any ablution activities. FINES will be payable should any person be caught.					Compliant	All work sites have ablution facilities.
					Compliant	6
					Partial Compliance	0
					Not Compliant	0

Phase of development	CONSTRUCTION pg. 47 of EMP					
Impact / issue	PLANT					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Waste management Please refer to	• Sustainable management of waste by recycling	• Disposal of rubble and refuse in an appropriate manner	Contractor, EO	Daily	Compliant	Site generally clean and tidy. Litter in road reserve from road users and not necessarily the contractor is still being

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

the waste minimization plan herewith attached	<ul style="list-style-type: none"> To keep the site neat and tidy Minimise litigation and complaints by I&AP's Reduce visual impact Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment. Minimise potential to pollute soils, water resources and natural habitats 	<ul style="list-style-type: none"> with no rubble and refuse lying on site Site is neat and tidy No complaints from surrounding industries and businesses Sufficient containers available on site No visible or measurable signs of pollution of the environment (soils, ground and surface water) 				cleaned up and a team was busy collect waste at section km0 – km1 at the time of the inspection.
Compliant						1
Partial Compliance						0
Not Compliant						0

Phase of development	CONSTRUCTION pg. 48 of EMP					
Impact / issue	PLANT					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Dust It is imperative that method statements regarding dust control be supplied to the ECO by the contractor prior to the commencement of any construction activities. Dust management and dust suppression during the	<ul style="list-style-type: none"> Reduce dust fall out Reduce visual impact Minimise loss of valuable soil material 	<ul style="list-style-type: none"> No visible signs of dust No complaints from interested and Affected parties No incidences reported to ECO No visible evidence of dust contamination 	RE, Contractor, EO	Monitored daily	Compliant	Contractor supplied method statement and indicated source and permission of water.

<p>construction phase is deemed very important. The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage.</p>		<p>the surrounding environment and especially the Glen, Koornlands and Klip Rivers.</p>				
<p>Potable water cannot (as far as possible) be used as a means of dust suppression, alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals.</p>		<ul style="list-style-type: none"> • Method statement • Baseline targets not exceeded during regular monitoring of dust counts 			Compliant	Contractor supplied method statement and indicated source and permission of water.
<p>Water extraction from the non perennial water courses will not be allowed.</p>					Compliant	No water is extracted from water courses up to date.
<p>The construction camp shall be watered during dry and windy conditions to control dust fallout.</p>					Compliant	Dust suppression done on site and verified with method statement.
<p>Dust production must be controlled by regular watering of roads and works area, should the need arise. (NB: Concrete dust is toxic and damages soil properties. Therefore watering to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust. This cement dust will be detrimental to the</p>					Compliant	No non-compliances observed.

environment.)						
At the end of construction, the site camp must be fully rehabilitated by removing the temporary surface, ripping the area to loosen the soil and the area must be re-vegetated with locally indigenous vegetation only, according to the landscape development plan for the project.					Compliant	Rehabilitation included in method statement. Rehabilitation method to be discussed with engineer and ECO at end of construction.
					Compliant	6
					Partial Compliance	0
					Not Compliant	0

Phase of development	CONSTRUCTION pg. 49 of EMP					
Impact / issue	PLANT					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
<p>Workshop equipment, maintenance and storage The contractors must provide and maintain a method statement for “workshop maintenance and cleaning of plant”.</p>	<ul style="list-style-type: none"> Prevent pollution of the environment Minimise chance of transgression of the acts controlling pollution 	<ul style="list-style-type: none"> No pollution of the environment No litigation due to transgression of pollution control acts 	RE, Contractor, EO	Monitored daily	Compliant	Method statement provided.
<p>All maintenance and washing of vehicles and equipment shall be done off-site as far as possible. During servicing of vehicles or equipment, a suitable drip tray shall be used to prevent spills onto the soil. Leaking equipment shall be repaired immediately or be removed from site to facilitate repair.</p>	<ul style="list-style-type: none"> Disposal of hazardous substances to a General & Hazardous Waste Landfill site. 	<ul style="list-style-type: none"> Method statement 			Compliant	No non-compliance observed.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and remediate to the satisfaction of the EO or RE. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. Sunorb.					Compliant	No non-compliance observed.
The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site. The Contractor must ensure that senior and the other relevant members of the workforce are trained in dealing with spills by using emergency spill kits.					Compliant	Spill kit available on site. Proof provided that key personnel in each team trained on how to use spill kit. Method statement on chemical and oil spill provided and refresher training given to staff.
All spills of hazardous substances must be reported to the ESO, EO, RE or ECO.					Compliant	Register on site. Spills recorded in monthly ECO repots and EO checklists.
The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) as well as specific specifications set forth by the health and safety agent.					Compliant	SHE Officer appointed to regulate compliance.
					Compliant	6
					Partial Compliance	0
					Not Compliant	0

Phase of development	CONSTRUCTION pg. 50 of the EMP						
Impact / issue	PLANT						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT	

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

<p>Noise All construction vehicles must be in a good working order to reduce possible noise pollution.</p>	<ul style="list-style-type: none"> • Maintain noise levels below “disturbing” as defined in the National Noise Regulations • Minimise the nuisance factor of the development 	<ul style="list-style-type: none"> • No complaints from surrounding landowners or I&APs 	Contractor, EO	As and when required	Compliant	No records of complaints received. EO to monitor compliance with EMP mitigation measures.
<p>Work hours during the construction phase shall be strictly enforced unless permission is given (07H00 – 18H00). Permission shall not be granted without consultation with the local industries and businesses by the EO. No work to be done on Sundays.</p>						
<p>Noise reduction is essential and Contractors shall endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement. All machinery to be muffled where possible.</p>						
<p>Noise reduction is essential and Contractors shall endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement. All machinery to be muffled where possible.</p>						
<p>Noisy activities shall take place only during working hours. The EO must inform the residents on the farms along the proposed road upgrade in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to use of pneumatic jack-hammers and compressors etc. No noise louder than 70dB from the ambient noise level.</p>						

Machinery and equipment on site must be maintained so as to avoid any unnecessary noises.						
Compliant						1
Partial Compliance						0
Not Compliant						0

Table 5: PROPOSED ROAD UPGRADE OF DR1699 AND DR1688, CALITDORPOUDTSHOORN, WESTERN CAPE, CONSTRUCTION PHASE EMP (Construction)

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
<p>Crew camps Accommodation for members of the workforce will not be permitted on site unless authorisation has been given in terms of the Environmental Authorisation issued for the site. If accommodation is to be provided for workers, details need to be provided as to the location and facilities to be provided for the workers.</p>	<ul style="list-style-type: none"> Minimise water pollution Minimise dust fallout Minimise unwarranted environmental damage outside the footprint Maintain a clean and healthy working environment Minimise visual impact to surrounding environment 	<ul style="list-style-type: none"> No signs of water or soil pollution No complaints from surrounding landowners or I&APs No visible signs of litter Method statements 	Contractor, EO, ESO	Monitor daily	NA	Accommodation not provided for workers on site and not part of EA.
Dedicated wash areas must be situated away from surface water sources.					Compliant	No wash areas present on site. Contractor to consult with ECO before wash area is to be located on site.
The contractor's camp shall be monitored for dust fallout and dust					Compliant	Dust suppression measures implemented, i.e. watering and gravel lining.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
suppression applied as required. This may include the laying of gravel, the use of grey water can be considered as an option if the required permits have been acquired.						
The contractor's camp, offices and storage facilities shall be located within the site boundaries. If this is not feasible an alternative should be designated in consultation with the ECO.					Compliant	<ul style="list-style-type: none"> Crusher site western and eastern boundary now clearly demarcated and rehabilitation completed according to method submitted by contractor. Rehabilitation of 3rd stockpile completed according to method submitted by contractor. Latest stockpile rehabilitated.
The contractor shall provide labourers to clean up the contractor's camp and construction site on a daily basis. These areas shall then be inspected by the contractor or his/her ESO to ensure compliance with this requirement.					Compliant	EO/ESO checks site daily. Weekly checklists kept on file. File to be updated weekly.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
The contractor shall be responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period and, the topsoil restored in areas where landscaping is to take place.					NA	To be audited at site close-out.
Fires The contractors must provide and maintain a method statement for "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised in creating the fire. Fire training and equipment to be nearby to put fires out. No wood is to be collected from private or public property. Fires must be within designated areas and must be in small scale.	<ul style="list-style-type: none"> • Minimise risk of veldt fires • Minimise destruction of natural fauna and flora • Maintain safety on site 	<ul style="list-style-type: none"> • No veldt fires started by the contractor's workforce • No claims from landowners for damages due to veldt fires • Method statement 	Contractor, EO, ESO	Monitor daily	Compliant	Method statement provided.
Absolutely no burning of waste is permitted.					Compliant	No instances observed on site.
Fires will only be allowed in facilities especially constructed for this purpose within fenced Contractor's camps. Wood					Compliant	Proof provided that employees were reminded that no open fires are allowed on site.

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
and/or charcoal are the only fuels permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose.						
Fires in the designated areas must be small in scale so as to prevent excessive smoke being released into the atmosphere.					Compliant	Suggested to designate safe areas for fire in consultation with ECO.
Heavy smoke may not be released into the air.					Compliant	No incidents observed or recorded up to date. EO/ESO to monitor.
No felling of trees or wood collection is allowed from private or public property.					Compliant	No incidents observed or recorded up to date.
The Contractor shall ensure that there is appropriate fire-fighting equipment available on site at all times.					Compliant	Contractor provided proof of fire training and fire-fighting equipment available on site.
Erosion and sedimentation All disturbed areas and road verges disturbed during the road upgrade activities needs to be rehabilitated. It is suggested that hydro seeding be done using indigenous plant seeds. The seed mix to be used during the rehabilitation phase should be according	<ul style="list-style-type: none"> • Minimise erosion damage • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Re-growth of disturbed areas. 	<ul style="list-style-type: none"> • No erosion scars • No loss of topsoil • No interference with the natural flow of water • No visible erosion scars once construction is completed • The footprint has not 	Contractor, EO, ESO	As and when required		

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
to the specification of a qualified Botanist. Please refer to attached list of hydro seeding specifications.		exceeded the agreed boundaries • All damaged areas successfully rehabilitated				
All the disturbed areas at the rehabilitated culverts/pipelines need to be rehabilitated and hydro seeded with carefully selected seed as per the specification of the Botanist/Horticulturist.					NA	Not applicable at this stage. Culverts to be rehabilitated by means of hydro-seeding as in recommended plan.
It is recommended that the management of the road reserve should not include uniform mowing of vegetation, and should be appropriate to the persistence of the remaining fragments of natural vegetation.					NA	Part of operation of road and reserve.
Construction activities at the culvert/pipelines need to be conducted during the dry season.					NA	Part of design and planning, not checked as part of ECO audit.
To reduce the loss of material by erosion, the contractor shall ensure that disturbance on site is kept to a minimum. The disturbance especially includes the					NA	To be audited at site close-out.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
movement of heavy vehicles. The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed. These areas are to be filled with mulch or funnels constructed to route the water.						
Every possible consideration should be given to the provision of silt-trapping devices or ponds on the upstream side of the road.					NA	Part of design, not checked as part of ECO audit.
These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas.						
In the case of strong wind and/or rain all stockpile material must be covered with a tarpaulin in order to prevent erosion.					NA	EO/ESO to ensure compliance in times of strong wind and/or rain.
Contractor needs to ensure that no spills, sediment laden or otherwise, occur into the irrigation system.					Compliant	No non-compliances observed.
All works on the approaches to and across the bridged rivers must be subject to Method					Compliant	Method statement received for structures. Statements structures submitted as

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

CONSTRUCTION pg. 51 – 63 of EMP						
CONSTRUCTION						
Phase of development						
Impact / issue						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Statements providing protection to the riverine environments.						needed.
Fauna <u>All activities on site must comply with:</u>	<ul style="list-style-type: none"> Minimise disturbance to animals Minimise interruption of breeding patterns of birds Minimise destruction of habitat 	<ul style="list-style-type: none"> No complaints from Nature Conservation No litigation concerning applicable animal protection acts No measurable or visible signs of habitat destruction 	RE, Contractor, EO, ESO	Monitor daily		
The regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962); and Marine Living Resources Act, 1998 (Act No. 18 of 1998).						
All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake a specialist must be called in to safely					Compliant	This aspect forms part of environmental induction training. Emergency contact numbers for fauna translocation available on site.

CONSTRUCTION pg. 51 – 63 of EMP						
CONSTRUCTION						
Phase of development						
Impact / issue						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
relocate the animal if the EO or ECO is not able to.						
Fauna species found during the construction activities along the road verges to be disturbed needs to be relocated to the adjacent natural farming field consisting of natural vegetation.					Compliant	No incidents up to date. ECO to be contacted immediately if fauna encountered that should be relocated.
Any crossings such as bridges, pipelines or culverts should explore suitable means to allow for wild animals to move freely and safely under the road.					Compliant	Animals can move freely under road at bridges.
Flora Once road rehabilitation is complete, rehabilitation of the disturbed areas must be undertaken in order to restore the aesthetic & ecological value of the area. It is recommended that a qualified Botanist/Horticulturist, and the ECO be consulted with regard to the most appropriate rehabilitation vegetation and structures. Active re-vegetation must	<ul style="list-style-type: none"> Encourage natural habitat fauna Minimise scarring of the soil surface and land features Minimise disturbance and loss of topsoil Minimise risk of veldt fires Minimise risk of fauna and flora destruction 	<ul style="list-style-type: none"> No exotic plants used for landscaping No visible erosion scars once construction is completed The footprint has not exceeded the agreed boundaries All damaged areas 	Contractor, EO, ESO, Landscape Architect	As and when required	Compliant	Rehabilitation included in method statement. Rehabilitation method to be discussed with engineer and ECO at end of construction for each section.

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
take place with locally indigenous seeds under the supervision of the ECO.		successfully rehabilitated				
Locally indigenous seeds need to be used during the hydro seeding of the disturbed areas/road verges/shoulders. The seed mix to be used during the rehabilitation phase should be according to the specification of a Botanist. Please refer to the approved Hydro seeding List as per the specification of the qualified Botanist attached.		<ul style="list-style-type: none"> No veldt fires started by contractors work force No claims from landowners for damages due to veldt fires. 			Compliant	Rehabilitation included in method statement. Rehabilitation method to be discussed with engineer and ECO at end of construction for each section.
All the disturbed areas at the upgraded culverts need to be rehabilitated. Rehabilitation needs to be done by hydro seeding the disturbed areas with endemic seed, as per the specification of the Botanist. Rehabilitation will prevent erosion and enhance the stabilization of the embankments. Please refer to the approved Hydro seeding List as per the specification of the qualified Botanist.					NA	Not applicable at this stage. Culverts to be rehabilitated by means of hydro-seeding as in recommended plan.
Point 11.5 of Environmental Authorisation					-	-

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
A Botanist has been appointed and the necessary botanical assessment and scan has been conducted: No Red-List or species of conservation concern (SCC) or endemic species were encountered during the survey. It is thought to be highly unlikely that species of conservation concern would be impacted by the proposed road upgrade.						
<ul style="list-style-type: none"> It must be emphasized that despite threatened status of the ecosystems through which the roads are aligned, the overall impression is that the vegetation within the road reserves is in poor, transformed condition and has low botanical sensitivity. It does not make any meaningful contribution to the conservation of the various vegetation or ecosystem types. 					-	-
<ul style="list-style-type: none"> The present generally 					-	-

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
poor condition of the vegetation in the road reserve of the DR1699 and DR1688 means that there is nothing of concern from a botanical perspective and that proposed road-building activities would have low negative impacts.						
<ul style="list-style-type: none"> The road reserve is however, despite its poor condition, an important zone of natural or semi-natural habitat that should be managed to encourage a diversity of plant species. Road building activities must therefore be approached with caution to ensure that there is no further degradation of the habitat. 					Compliant	Disturbance along road is mostly kept to practical minimum size and contained within the degraded road reserve. Any disturbance outside demarcated footprint to be marked as no-go areas, rehabilitated and records kept on file.
<ul style="list-style-type: none"> Should any species of conservation concern be found the Eco needs to be informed. The Eco will ensure that this species 					Compliant	No plants of conservation value found up to date. Some bulbs removed where culvert installed, and replanted in adjacent road

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
be taken to GNEC rehabilitation nursery until the end of the construction period and then planted back during the rehabilitation process.						reserve.
Point 11.11 of Environmental Authorisation Should any plants of geophytes of significant value be found along the road verges/shoulders it needs to be temporarily re-located to the GNEC rehabilitation nursery until the end of the construction period. At the end of the construction period these species will be planted back as part of the rehabilitation process.					Compliant	No plants of significant value found up to date.
Plants that are proclaimed as problem plants or noxious weeds must be excluded from the landscaping plan and these must be removed immediately, should they occur on site.					Compliant	Rehabilitation included in method statement. Rehabilitation method to be discussed with engineer and ECO at end of construction for each section. Hydro seeding List attached to EA to be consulted, no weeds will be

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
						used during landscaping.
No plants/trees may be destroyed prior to notify the ECO about the plan. The ECO is to approve all plants to be removed.					Compliant	Disturbance along road is mostly kept to practical minimum size and contained within the degraded road reserve. Any disturbance outside demarcated footprint to be marked as no-go areas, rehabilitated and records kept on file.
The contractor must rehabilitate the construction camp and any other disturbed areas once construction activities have terminated. Compacted areas will be ripped and mulched in order to ensure recovery of the natural vegetation cover. These areas needs to be hydro seeded with the approved seed mix as per the specifications of the Botanist. Please refer to the hydro seeding list attached.					Compliant	Rehabilitation included in method statement. Rehabilitation method to be discussed with engineer and ECO at end of construction for each section. Hydro seeding List attached to EA to be consulted.
The management of the road reserve should not include uniform mowing of vegetation.					NA	Part of operation of road and reserve.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

CONSTRUCTION pg. 51 – 63 of EMP						
CONSTRUCTION						
Phase of development						
Impact / issue						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
No open fires shall be allowed on site under any circumstances, fires will only be permitted in adequate facility within the crew camp, Forest Act, 1984 (Act No. 122 of 1984).					Compliant	No non-compliances observed.
Areas that are disturbed must be monitored by the ECO or a suitably qualified person and rehabilitated on completion of construction (e.g. seeds should be collected from plants in the same community in nearby undisturbed vegetation for use during rehabilitation).					Compliant	Rehabilitation included in method statement. Rehabilitation method to be discussed with engineer and ECO at end of construction for each section. Hydro seeding List attached to EA to be consulted.
Heritage No archaeological or historical material of any significance was noted on site.	<ul style="list-style-type: none"> Limit the destruction of the country's heritage resources The preservation and appropriate management of new archaeological finds should these be discovered during construction. 	<ul style="list-style-type: none"> No destruction of or damage to known archaeological sites 	Contractor, EO, RE, ESO	Monitor Daily		
In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found shall cease immediately and the ECO					Compliant	Contractor confirmed content of procedure of heritage finds included in procedure in toolbox talk. Proof provided and kept on file.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
as well as the Local Council shall be notified within 24 hours.						
Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist.						
Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with.						
Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the Heritage Western Cape and/or the South African Heritage Resources Agency on the appropriate provincial heritage resource agency.						
No-go / sensitive areas The watercourses found along DR1699 and DR1688 should be clearly cordoned off as a no go area. No construction activities will be allowed within the	<ul style="list-style-type: none"> Minimise the potential for the spread of the construction footprint. Reduce loss of 	<ul style="list-style-type: none"> No sign of movement through “no go” areas. Containment of footprint 	RE, Contractor, ESO, EO	Monitor daily	Compliant	Construction in watercourse mostly kept to minimum and restricted to road reserve. Re-fencing in progress and no-go areas demarcated.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
watercourses. These areas need to be cordoned off before construction activities may commence together with the appropriately qualified ECO.	fauna and flora habitat. <ul style="list-style-type: none"> Minimise the potential for loss of protected and or endangered fauna and flora species. 					Access roads created by farmer at km km1.66 and not by contractor.
Construction activities of the upgraded culverts/pipelines at the watercourses should be kept to a minimum.					Compliant	Construction in watercourse mostly kept to minimum and restricted to road reserve. Access roads created by farmer at km km1.66 and not by contractor.
The contractor needs to provide method statements of the upgrade of the culverts/pipelines at the watercourses, before any construction activities will be allowed. The ECO needs to approve these method statements before activities may commence.					Compliant	Method statement provided.
Topsoil stockpiles are to be demarcated with danger tape and seen as no-go areas.					Compliant	Topsoil stockpiles has signage.
All construction activities must remain within the boundaries of the development area, as demarcated at the start of					Compliant	ECO inspects demarcations as part of monthly audits. EO to be present for demarcation of entire site. Any

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
<p>the construction phase. There must be no vehicular access to the drainage lines outside the development area thus reducing the infringement of the development on natural habitat. The construction footprint must be kept to a minimum by constructing boundaries and demarcated areas not to be disturbed. These No-go areas must be demarcated with fencing / warning tape and signs before any construction activities commence. These areas and the type of fencing/demarcation must be approved by the relevant specialist involved in the EIA process. The EO and ECO must be on site in order to make sure the correct areas are fully demarcated.</p>						<p>disturbance outside demarcation to be considered a new finding. Construction footprint kept within boundaries of development as far as possible.</p>
Access route/haul roads	• Minimise loss of	• No erosion on	Contractor,	As required,	Compliant	Access controlled as far as

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
Existing roads and services must be utilised thus reducing the infringement of the development on natural habitat. If new access roads have to be constructed the road should follow existing roads for as far as possible in order to minimize the area of disturbance.	topsoil and enhancement of erosion • Minimise fauna and flora displacement by destruction of natural habitats	access roads after completion of construction • No loss of topsoil due to runoff water on access roads	RE or EO	monitor daily		possible. Unauthorized access roads and turning lanes to be marked as 'no-go' areas and rehabilitated. Proof of rehabilitation to be kept on file.
Any authorised clearing for access roads must be done under the supervision of the ECO.					Compliant	New access roads to be indicated on layout map and sent to ECO for consideration.
Access roads for earthmoving-equipment must be clearly designated and be positioned as close as possible to the proposed development site. No driving off from the marked roads is permitted and designated parking areas must be identified and demarcated with applicable signage.					Compliant	Access road kept as close as possible to construction site, and within degraded road reserve. Proof of rectification, in the case of non-compliances, to be kept on file.
Neither the site nor its access roads must be allowed to be utilised for recreational activities, this					Compliant	EO/ESO to check compliance daily. All personnel new to site/non-permanent workers to sign

CONSTRUCTION pg. 51 – 63 of EMP						
CONSTRUCTION						
Phase of development						
Impact / issue						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
includes but is not limited to quad bikes, 4x4's and dirt bikes. Security personnel ensure that this is enforced. No unauthorised access is permitted.						in at site office. Contractor provided method statement on site security and identification of site/project workers.
Crime, safety and security No site staff, other than security personnel and skeleton staff shall be housed on site unless otherwise stipulated in the Environmental authorisation. Security personnel and skeleton staff shall be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities. A boundary fence will serve to prevent public access to the site, for public safety and security reasons. The access to the site must be controlled so as to restrict unauthorised personnel from entering the site. The workers on site must retain some	<ul style="list-style-type: none"> • Reduce the risk of potential incidences • Minimise the potential impact on the environment • Reduce the risk of possibly fatal incidents occurring on site. 	<ul style="list-style-type: none"> • No incidences reported 	RE, Contractor, ESO, EO	Monitor daily	Compliant	EO/ESO to check compliance daily. All personnel new to site/non-permanent workers to sign in at site office. Contractor provided method statement on site security and identification of site/project workers.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on site at all times.						
The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations.					Compliant	SHE Officer appointed to regulate compliance.
Site specific conditions and regulations as set forth by the health and safety agent should also be adhered to.					Compliant	SHE Officer appointed to regulate compliance.
The contractor shall ensure that all emergency procedures are in place prior to commencing work. Emergency procedures shall include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc.					Compliant	Contractor provided method statements and/or toolbox talks for fires and accidents, including spills, to employees.
The contractor shall					Compliant	List of emergency numbers

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

CONSTRUCTION pg. 51 – 63 of EMP						
CONSTRUCTION						
Phase of development						
Impact / issue						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site.						kept on site. EO/ESO to ensure emergency numbers are up during weekly checks.
The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.					Compliant	List of emergency numbers kept on site. EO/ESO to ensure emergency numbers are up during weekly checks.
Visual impact Shade cloth must be utilised to conceal and minimise the visual impact of contractor camps, lay down and storage areas.	• Minimise visual impact	• No complaints from I & AP's	Contractor, landscape contractor, ESO	Monitor daily	Compliant	Very few visual receptors. If complaints are received, shade cloth to be constructed around stockpile areas.
Rehabilitation by means					Compliant	Rehabilitation included in

CONSTRUCTION pg. 51 – 63 of EMP						
CONSTRUCTION						
Phase of development						
Impact / issue						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
of hydro seeding the disturbed areas/road verges along DR1699 and DR1688 must enhance the aesthetic appeal along the upgraded roads. Indigenous seeds need to be utilized for the hydro seeding mix as per the specification of a qualified Botanist. Please refer to the attached hydro seeding list as per the specifications of Botanist.						method statement. Rehabilitation method to be discussed with engineer and ECO at end of construction for each section. Hydro seeding List attached to EA to be consulted.
Rubble and litter must be removed every two weeks or more often as the need arises and be disposed of at a registered landfill site as designated by Kannaland Municipality and Eden District Municipality Solid Waste removal department.					Compliant	<ul style="list-style-type: none"> Waste disposed at registered landfill site, records of waste register kept on file. Safe disposal slips of hazardous & general waste disposal kept on file once available. File to be updated as necessary.
Hydrology Increased run-off during construction must be managed using berm and other suitable structures as required to ensure flow velocities are reduced;	<ul style="list-style-type: none"> Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments 	<ul style="list-style-type: none"> No visible signs of pollution No signs of siltation of water courses No visible 	RE, Contractor, EO	As and when required, monitor daily	Compliant	Contractor supplied method statement.

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
<p>this must be done in consultation with the Resident engineer as well as the ECO. The Contractor shall take reasonable measures to control the erosive effects of storm water runoff.</p>	<ul style="list-style-type: none"> Minimise impeding the natural flow of water Minimise the impact on natural water flow dynamics Minimise scarring of the soil surface and land features. 	<p>erosion scarring once construction is completed</p> <ul style="list-style-type: none"> Minimum loss of topsoil No access roads through river and stream banks. 				
<p>Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell.</p>					NA	Part of design, not checked as part of ECO audit.
<p>In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) shall be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas and water courses.</p>					NA	No incident recorded to date.
<p>The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter the watercourses found along road. Every possible consideration</p>					NA	Part of design, not checked as part of ECO audit.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

CONSTRUCTION pg. 51 – 63 of EMP						
CONSTRUCTION						
Phase of development						
Impact / issue						
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
should be given to the provision of silt trapping devices.						
No wastewater may run freely into the surrounding area.					Compliant	No non-compliance observed.
Every possible consideration should be given to the provision of silt-trapping devices or ponds on the upstream side of the road.					NA	Part of design, not checked as part of ECO audit.
Soil Topsoil must be stripped from all areas that are to be utilized during the road upgrade period and where permanent structures and access is required. These areas will include comprising the permanent works, upgrade of culverts/pipelines, stockpiles, access roads, construction camps and lay down areas.	<ul style="list-style-type: none"> Minimise scaring of the soil surface and land features Minimise disturbance and loss of soil Minimise construction footprint Maintain the integrity of topsoil's for future landscaping and rehabilitation 	<ul style="list-style-type: none"> No visible erosion scars once construction is completed The footprint hasnot exceeded the agreed site in terms of EA etc. Minimal invasive weed growth No signs of sedimentation and erosion Method statement 	Contractor	Daily	Compliant	Topsoil removal forms part of 'general method statement' provided by contractor. Topsoil removed from construction areas, i.e. stockpile, passing lanes and construction footprint and will be returned after construction as part of rehabilitation.
Topsoil must be deemed to be the top layer of soil containing organic material, nutrients and plant grass seed. For this	<ul style="list-style-type: none"> Containment of invasive plant growth 					

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas.						
At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 300 mm and stockpiled on the demarcated topsoil stockpile areas/windrowed.					Compliant	Topsoil removal forms part of 'general method statement' provided by contractor. Topsoil removed from construction areas, i.e. stockpile, passing lanes and construction footprint and will be returned after construction as part of rehabilitation.
However, the use of topsoil for rehabilitation contaminated by the seed of alien vegetation must not be permitted unless a programme to germinate the seed and eradicate the seedlings is drawn up and approved, or some other mitigatory feature is found. This must be approved by the ECO.					NA	Not applicable at this stage.
Single handling is recommended. Stock piles must not be higher than 2m to avoid compaction.					Compliant	Topsoil stockpiles height comply.
Dust suppression is necessary for stockpiles older than a					Compliant	Dust suppression applied to site.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

Phase of development	CONSTRUCTION pg. 51 – 63 of EMP					
Impact / issue	CONSTRUCTION					
MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	RESPONSIBLE PARTY	FREQUENCY OF ACTION	COMPLIANCE	COMMENT
month – with either water or a biodegradable chemical binding agent.						
Backfill will require contouring to ensure that it blends in with the surrounding environment.					NA	Will form part of rehabilitation and site close-out.
Storage and stockpiling of construction material must also observe a suitable buffer from the water courses.					Compliant	Stockpile areas approved to maintain suitable buffers from watercourses.
Compliant					52	
Partial Compliance					0	
Not Compliant					0	

Phase of development	CONSTRUCTION pg. 64 of EMP	
Impact / issue	TOLERANCES	
MITIGATION MEASURE	RESPONSIBLE PARTY	FREQUENCY OF ACTION
<p>Fines Fines for the activities detailed below, will be imposed by the Engineer on the Contractor and/or his Sub-contractors.</p> <p>a) Any employees, vehicles, plant, or thing related to the Contractor’s operations operating within the designated boundaries of a “no-go” area. R 5 000</p> <p>b) Any vehicle driving in excess of designated speed limits. R 500</p> <p>c) Persistent and un-repaired oil leaks from machinery. R 2 000</p> <p>d) Persistent failure to monitor and empty drip trays timeously. R 1 000</p> <p>e) The use of inappropriate methods for refuelling. R 1 000</p> <p>f) Litter on site associated with construction activities. R 5 000</p> <p>g) Deliberate lighting of illegal fires on site. R 2 000</p> <p>h) Any employee eating meals on site, outside of the defined eating area. R500</p> <p>i) Employees not making use of the site ablution facilities. R 2 000</p> <p>j) Failure to implement specified noise controls R 1 000</p> <p>k) Failure to empty waste bins on a regular basis. R 1 000</p>	Engineer	Monitor daily

<p>l) Inadequate dust control. R 1 000 m) Any act, that in the reasonable opinion of the Engineer, constitutes a deliberate contravention of the requirements of these Specifications. R2 000 n) Any water abstraction activities from the river R5 000 o) or each subsequent similar offence the fine shall be doubled in value to a maximum value of R 40 000.</p> <p>The Engineer, in conjunction with the ECO shall be the judge as to what constitutes a transgression in terms of this clause, subject to the General Conditions of Contract.</p>		
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2. WASTE, WATER USE AND ELECTRICITY CONSUMPTION MINIMIZATION AND MANAGEMENT PROGRAMME – CHECKLIST

2.1. Waste Minimization Plan (pg. 87 - 89 of EMP document)

2.1.1. WASTE MINIMIZATION DURING CONSTRUCTION

Issue	Minimization Plan	Compliance	Comment
General Considerations			
1. Standardization of dimensions of dimensions	The developer will for as far as it is economically feasible design the road to maximize the use of standard dimensions in order to minimize the amount of cutting waste during construction.	NA	Part of design and planning/design phase, not checked as part of ECO audit.
2. Material Selection	The developer will, for as far as it is economically feasible select: a) materials for least waste generation during preparation and use during construction b) materials used in the construction which are durable in order to minimise maintenance or replacement c) standard materials to increase re-use/ recycling potential d) materials which are sourced locally	NA	Part of design and planning/design phase, not checked as part of ECO audit.
3. Pre-Fabrication	The developer will, for as far as it is economically feasible make use of pre-fabricated components in order to minimise waste on site and permit re-use by the manufacturers of any waste generated during construction of the road.	NA	Part of design and planning/design phase, not checked as part of ECO audit.
4. Hazardous Substances	The developer will, for as far as it is economically feasible make use of non-hazardous substances to replace hazardous substances such as replacing asbestos with fibre glass etc.	NA	Part of design and planning/design phase, not checked as part of ECO audit.
5. Maintenance	a) The developer will, for as far as it is economically feasible design the structure of the road in such a way that it minimizes but facilitates maintenance, in order to prolong the life-span of the structure and reduce	NA	Part of design and planning/design phase, not checked as part of ECO audit.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

	<p>the amount of waste resulting from demolition.</p> <p>b) The developer will, for as far as it is economically feasible design the structure of the road in such a way that maintenance does not require the use of hazardous or toxic substances. This will ensure that minimal waste will be un-recyclable due to contamination/</p>		
6. Ordering	The developer will strive to order materials “just-in-time” to avoid deterioration/ breakage during storage. The developer will strive to (as far as reasonably possible) order materials only from suppliers which will take back any unused/ off-spec or broken materials favoured. The developer will strive to (as far as reasonably and economically possible) order materials in bulk to reduce packaging but without over-ordering resulting in waste generation. Suppliers which take back the packaging will be favoured by the developer.	NA	Part of design and planning, not checked as part of ECO audit.
7. Load and unloading of materials	The construction site staff will be trained to load and unload materials correctly to avoid breakage and wastage.	Compliant	No non-compliance observed.
8. Storing of materials	Care will be taken to ensure that materials are stored appropriately according to supplier specifications to reduce the risk of damage or deterioration.	Compliant	No non-compliance observed.
9. The use of temporary structures	The developer will attempt to keep temporary structures on site to a minimum. Where unavoidable the temporary structures used on this site, will be re-used on other sites.	NA	Part of design and planning, not checked as part of ECO audit.
10. General	<p>a) The contractors must provide and maintain a method statement for “solid waste management”. The method statement must provide information on the proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. For the disposal of clean building rubble, a General & Hazardous Waste Landfill can be utilized.</p> <p>b) Waste shall be separated into recyclable and non- recyclable waste, and shall be separated as follows: Hazardous waste: including (but not limited to) old oil, paint, etc.</p> <p style="padding-left: 40px;">a. General waste: including (but not limited to) construction rubble.</p> <p style="padding-left: 40px;">b. Reusable construction material</p> <p>c) Recyclable waste shall preferably be deposited in separate bins. The contractor is advised that “Collect-a-Can” collect tins, including paint tins, chemical tins, etc. and “Consol” collect glass for recycling.</p> <p>d) Any illegal dumping of waste will not be tolerated.</p>	Compliant	<p>Contractor provided method statement for “solid waste management”. Recycling not feasible at this site. Marked bins available for separation of waste.</p> <p>Waste should be separated as follows:</p> <p style="padding-left: 40px;">a) Hazardous waste: including (but not limited to) old oil, paint, etc.</p> <p style="padding-left: 40px;">b) General waste: including (but not limited to) construction rubble.</p> <p style="padding-left: 40px;">c) Reusable construction</p>

	<p>e) Proof of legal dumping must be able to be produced on request.</p> <p>f) Bins must be clearly marked for ease of management.</p> <p>g) All refuse bins must have a lid secured so that animals cannot gain access.</p> <p>h) Under no circumstances may any waste be burnt.</p> <p>i) All waste must be managed in accordance with the Minimum Requirements for waste disposal by landfill 2nd ed 1998.</p> <p>j) The minimum requirements for easy access by waste disposal service trucks will be met in order for vehicles to effectively access the waste. All waste must be disposed of at a registered site. It is the management bodies' responsibility to ensure that the contracted party responsible for waste disposal disposes of the waste at the correct facility. This facility refers to a <i>General & Hazardous Waste Landfill site</i> as referred to by Kannaland Municipality and Eden District Municipality Solid Waste management Department. These landfill sites are permitted by Department Water and Forestry with operating numbers in place.</p> <p>k) The use of building materials which result in least amount of waste generated (e.g. pre-fabrication as opposed to on-site construction/fabrication) will be favoured by the developer as far as economically feasible.</p> <p>l) Materials will be re-used on site wherever possible.</p> <p>m) Off-cuts and equipment will be re-used on other jobs wherever possible.</p>		<p>material.</p> <p>Waste register to be updated and proof of safe disposal kept on file.</p>
Compliant		3	
Partial Compliance		0	
Not Compliant		0	

2.2. Water Use and Management Plan (pg. 90 of the EMP Document)

CONSTRUCTION PHASE		Compliance	Comment
Issue	Management Plan		
General Considerations			
1. DUST SUPPRESSION	<p>Potable water cannot (as far as possible) be used as a means of dust suppression, alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals.</p> <p>Water extraction from the watercourses will not be allowed.</p>	Compliant	Contractor provided documentation on the source of dust suppression water.
2. ABLUTIONS	The developer will reuse as much of the water from wash basins on site as possible.	Compliant	Contractor to consider reuse of water where possible on site.

ECO CHECKLIST: THE REHABILITATION OF DIVISIONAL ROAD 1688 FROM CALITZDORP (KM1.00) TO THE CALITZDORP SPA TURNOFF (KM15.64), WESTERN CAPE PROVINCE

3. CONCRETE AND CEMENT PREPARATION	i. The developer/contractor will order concrete and cement from supplier for as far as possible. i. The mixing area should contain any liquids to prevent contamination of soil and storm water	Compliant	Cement mixer on impermeably lined surface.
4. GENERAL CLEANSING OPERATIONS	a) All hoses will be fitted with trigger gun spray nozzles to limit wastage. b) Dry sweeping will be used (for as far as possible) in preference to washing of areas and equipment. c) Wherever possible biodegradable and non-toxic detergents, soaps and degreasers will be used. d) Regular Maintenance of equipment will be conducted in order to prevent wastage.	Compliant	Contractor provided method statement on “workshop maintenance and cleaning of plant”.
Compliant		4	
Partial Compliance		0	
Not Compliant		0	